

Alkane Resources

Initiation: Ain't she Boda-ful

INITIATION

We initiate coverage on Alkane Resources with a Buy recommendation and \$1.3/sh target price. ALK is an NSW focused gold producer and explorer. Following divestment of its rare earth project and recent exploration discoveries, we believe ALK could transform into a mid-tier gold miner. Post the recent correction, we believe the share price offers an attractive entry point with a free exploration option on a potential giant porphyry district.

Emerging Mid-Tier Gold Miner: Step 1 Grow Tomingley

- ALK recently divested its complex & expensive rare earth project (ASM) and made two significant exploration discoveries. We believe it now has the potential to transform into a mid-tier gold miner with two assets producing ~200koz at low cash cost with long life.
- Their Tomingley gold mine has defined a large 1.1Moz resource close to existing infrastructure. Once permitted, we expect gold output to double, returning to ~80koz, adding +10 years life at a low cost of A\$1,200/oz.
- We value Tomingley at \$493m (82cps) and expect it to generate \$40m pa of cash, which can self-fund growth and Boda exploration at \$15m pa.
- Next catalysts include an updated Resource in late January, preliminary SAR mine plan in February and permitting by mid-2021.

Step 2: Boda - Potential Giant

- In Sep 2019 ALK discovered a new copper/gold porphyry called 'Boda'.
- It is only early days and will take several years** to drill and develop. But a high-grade zone was quickly identified that could contain ~1.5Moz AuEq which we value on an EV/Resource of A\$170/oz (42cps).
- Analysis of porphyry systems gives us confidence that Boda has the **potential to host a large district** with a 'Tier 1' label. *See Appendix 2-4: 'Porphyry 101' + Cadia & Northparkes Case Studies.*
- Next catalysts involve drill results which will increase following the addition of a second rig. *Keep an eye on Boda 2 and Kaiser.*

Initiate with Buy rec; TP \$1.30/sh

- We value ALK on a sum of the parts EV/Resource and DCF assuming 6.4% WACC and long-term gold of US\$1,600/oz and 0.70 AUDUSD.
- It has a clean balance sheet, net cash of \$25m and minimal hedge book.
- Key risks include A\$ gold price, permitting, exploration.

Year-end June (\$)	FY19A	FY20A	FY21E	FY22E	FY23E
Revenue (\$m)	94.0	72.5	122.4	118.0	130.0
EBITDA (\$m)	32.2	28.6	56.1	65.9	76.7
EBIT (\$m)	25.0	19.9	44.7	55.4	65.7
Reported NPAT (\$m)	23.1	12.8	31.2	38.5	45.9
Reported EPS (c)	4.5	2.3	5.2	6.4	7.7
Normalised NPAT (\$m)	22.8	16.5	31.2	38.5	45.9
Normalised EPS (c)	4.4	2.9	5.2	6.4	7.7
EPS Growth (%)	(6.7)	(33.6)	78.4	23.7	19.0
Dividend (c)	-	-	-	-	-
Net Yield (%)	-	-	-	-	-
EV/EBITDA (X)	10.0	12.2	7.1	5.5	4.3
Normalised P/E (x)	18.3	27.6	15.5	12.5	10.5
Normalised ROE (%)	11.3	8.9	17.5	18.8	18.6

Source: OML, Iress, Alkane Resources

Last Price

A\$0.81

Target Price

A\$1.30

Recommendation

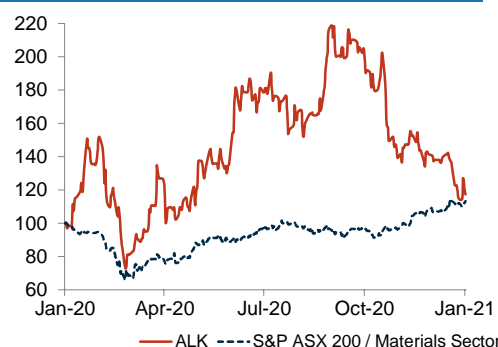
Buy

Risk

Higher

Gold	
ASX Code	ALK
52 Week Range (\$)	0.50 - 1.50
Market Cap (\$m)	479.3
Shares Outstanding (m)	595.4
Av Daily Turnover (\$m)	2.2
3 Month Total Return (%)	-40.6
12 Month Total Return (%)	17.5
Benchmark 12 Month Return (%)	13.4
NTA FY21E (¢ per share)	31.2
Net Cash FY21E (\$m)	27.3

Relative Price Performance



Source: FactSet

Consensus Earnings		
	FY21E	FY22E
NPAT (C) (\$m)	22.1	19.7
NPAT (OM) (\$m)	31.2	38.5
EPS (C) (c)	3.8	3.0
EPS (OM) (c)	5.2	6.4

Source: OML, Iress, Alkane Resources

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Alkane Resources (ALK) Production & Valuation Summary

Valuation	Ords	Base Case	Scenario Analysis (\$/sh)	
	A\$/m	A\$/sh	Fwd Curve	Spot
Sum of the Parts				
Tomingley	493	0.82	1.1	0.9
Boda	251	0.42	0.4	0.4
Investments (GMD/CAI)	46	0.08	0.08	0.08
Net Cash (Last)	25	0.04	0.04	0.04
Corporate O/H	(21)	(0.03)	(0.03)	(0.03)
Total	795	1.33	1.59	1.37

Target Price	1.30
TSR (%)	49%
Recommendation	Buy

NPV Sensitivity (A\$/sh)			Ebitda Sensitivity FY21 (A\$/m)				
AUD	Gold US\$/oz			AUD	Gold US\$/oz		
	1,500	1,600	1,700		1,500	1,600	1,700
0.700	1.39	1.49	1.59	0.700	33	37	40
0.750	1.30	1.39	1.48	0.750	29	33	36
0.800	1.22	1.30	1.38	0.800	26	29	33

Boda Valuation	Ore	Grade	Metal
	Mt	g/t AuEq	Moz AuEq
High Grade Ore	19	3.5	1.5
Recovery	%	70	
EV/Resource (\$/oz)	A\$/oz	170	
Valuation	A\$/m	251	

Capital Structure		
Shares on Issue	mn	595.4
Options/Performance Rights	mn	3.2
Shares on Issue (Diluted)	mn	598.6
Market Cap	A\$/m	518
Net Cash (Last)	A\$/m	25.4
Enterprise Value	A\$/m	493
EV/Reserve	A\$/oz	2,799
EV/Resource	A\$/oz	269

WACC	
Risk free rate (RFR)	2.5%
Beta	1.1
Equity Risk Premium	6.0%
Cost Of Equity	9.1%
CoD (Post Tax)	4.2%
WACC (Real)	6.4%

Listed Investments	Holding	Value
	%	A\$/m
Genesis (GMD)	19.9%	29.3
Calidus (CAI)	10.5%	17.2
Total		46.4

Hedge Book			
		FY21	FY22
Gold Sold	koz	8.3	6.0
Hedge Price	A\$/oz	1,906	2,534
Income/(Cost)	A\$/m	(3.2)	(0.2)
		Total	
			14.3
			2,244
			(3.4)

Mineral Inventory	Ore	Grade	Gold	Mine life
	Mt	g/t	koz	Years
What We Model	12.0	2.1	824	12.0
Opencut	1.4	2.0	90	1.4
Underground	13.4	2.1	914	13.4
Total Inventory				

Reserve			
Opencut	0.8	1.4	36
Underground	2.2	2.0	140
Total Reserve	3.0	1.8	176

Resource (M+H)			
TGO Opencut	4.9	1.5	238
TGO Underground	4.5	2.6	372
SAR OC (SAR)	18.0	1.9	1,113
Other (Peak Hill)	1.0	3.3	108
Total Resource	28.4	2.0	1,831

Financials		19A	20A	21F	22F	23F
Revenue	A\$/m	94	73	122	118	130
EBITDA	A\$/m	32	29	56	66	77
NPAT	A\$/m	23	13	31	39	46
EPS	A\$/sh	4.4	2.9	5.2	6.4	7.7

Cash flow metrics						
Operating CF	A\$/m	36	29	56	59	60
Exploration	A\$/m	(21)	(20)	(19)	(15)	(15)
Capex	A\$/m	(33)	(39)	(42)	(18)	(34)
Other Investments	A\$/m	15	(19)	(30)		
Net Investing CF	A\$/m	(39)	(77)	(91)	(33)	(49)
Free Cash Flow	A\$/m	(2)	(49)	(35)	26	11

Balance Sheet						
Cash	A\$/m	70	67	35	62	72
Debt (Finance Leases)	A\$/m		7	8	8	8
Net Cash/(Debt)	A\$/m	70	60	27	54	64
Gearing (ND/E)	%	(32)	(39)	(15)	(24)	(24)

Valuation Metrics						
Ebitda Margin	%	34	39	46	56	59
EV/Ebitda	x	5.8	10.8	9.7	8.7	7.6
P/Cashflow	x	(51.3)	(5.1)	(15.0)	19.7	48.0
FCF Yield	%	(2)	(20)	(7)	5	2

Commodity Price & FX Forecast		19A	20A	21F	22F	23F	LOM
AUDUSD	x	0.7	0.67	0.74	0.70	0.70	0.70
Gold	US\$/oz	1,264	1,563	1,867	1,800	1,702	1,600
Gold	A\$/oz	1,780	2,333	2,517	2,571	2,431	2,286
Realised Price (inc Hedges)	A\$/oz	1,777	2,197	2,291	2,567	2,431	2,325

Tomingley Gold Mine (TGO)		19A	20A	21F	22F	23F	LOM
Opencut							
Strip Ratio	x	4.4		149.2	2.0	10.6	9.9
Ore Mined	kt	391		23	569	500	11,989
Gold Grade	g/t	1.7			1.6	2.0	2.1
Opex (TMM)	A\$/t	5.5			0.9	0.2	3.9

Underground							
Ore Mined	kt	9	341	762	500	500	112
Gold Grade	g/t	1.12	2.38	2.30	2.00	2.00	2.00
Opex (ROM)	A\$/t		26.7	30.6	35.0	35.0	33.6

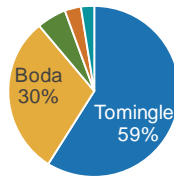
Processing							
Ore Milled	kt	999	839	990	900	950	1,060
Gold Grade	g/t	1.66	1.45	1.85	1.80	1.90	2.11
Recovery	%	91.9	85.8	87.2	88.0	92.0	91.6
Gold Produced	koz	49	34	51	46	53	66
Gold Sold	koz	52	33	53	46	53	66

Operating Cost							
Opencut	A\$/t	5.5		0.0	0.9	0.2	3.9
Underground	A\$/t		27	31	35	35	34
Processing	A\$/t	20	21	20	20	20	20
Admin	A\$/m	4.5	5.3	6.1	6.0	6.0	6.0
Cash Cost	A\$/oz	905	1,152	1,241	1,134	997	1,207
AISC	A\$/oz	948	1,357	1,492	1,302	1,450	1,290

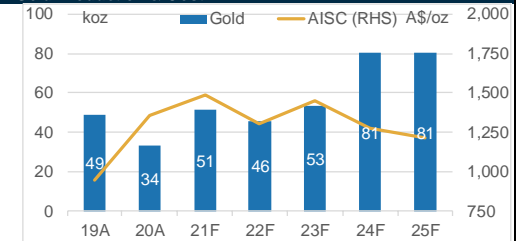
COGS							
Corporate O/H	A\$/m	2.7	2.5	4.1	2.5	2.5	2.5
Exploration (inc Boda)	A\$/m	21	20	19	15	15	5
Sustaining Capex	A\$/m	33	39	42	18	34	3

Guidance						
Gold	koz	30-40	30-35	47-52		
AISC	A\$/oz	1050-1150	1250-1400	1450-1600		

Valuation by Source



Gold Production & Cost



Thesis: Potential Mid-Tier Gold Miner

We initiate coverage on Alkane Resources Limited ('ALK') with a Buy recommendation and A\$1.30/sh target price. Historically ALK screened poorly. It was a small gold miner with a limited life and a complicated, expensive rare earth project (ASM). In our view, following the **divestment of ASM**, along with recent exploration discoveries, ALK has the potential to transform into a mid-tier ASX gold miner with multiple assets producing ~200koz pa gold equivalent metal.

ALK owns 100% of **Tomingley gold mine** in central NSW, which in FY20 produced 33koz of gold at an all-in cost of A\$1,357/oz. **In 2018 ALK discovered San Antonio and Roswell ('SAR'), 2km south** of its existing mine infrastructure. We believe the resource could **revitalise the mine at a low cost of ~\$30m**. By FY24/25 we expect **SAR production to double, returning gold output to 80koz** as well as boost mine life by over a decade (from three years) at a low cost of A\$1,300/oz.

Boda is an exploration project located 35km east of Dubbo in central NSW. **It is only early days** and going to take **3-5 years to drill and define**, but we believe it **has the potential to host a giant porphyry district**. We value Boda on an EV/Resource on expectation of only a high-grade zone containing 1.5Moz gold being defined. But analysis of other porphyry systems leads us to believe there is a **high probability of significant further exploration discoveries** over the medium term. Cash flow from Tomingley could assist in funding a smaller scale underground mine A\$150-300m (1.0-2.0mtpa) producing 90-190koz pa AuEq metal.

We value ALK at A\$782m which is based on a sum of the parts EV/Resource and DCF, which assumes WACC of 6.4% (Real) long-term gold price of US\$1,600/oz and AUD/USD of 0.70.

Key catalysts include:

1. Late Jan 2021: updated San Antonio resource
2. Late Feb 2021: release of preliminary mine plans for SAR and development timeline.
3. Mid 2021: government approval for SAR
4. Ongoing Boda Drilling: following the addition of a second drill rig, we eagerly await results of extension drilling and at Boda 2 and Kaiser.

Figure 1: ALK Valuation Summary & Scenario Analysis

Valuation	Ords Base Case		Scenario Analysis (\$/sh)	
	A\$m	A\$/sh	Fwd Curve	Spot
Sum of the Parts				
Tomingley	493	0.82	1.1	0.9
Boda	251	0.42	0.4	0.4
Investments (GMD/CAI)	46	0.08	0.08	0.08
Net Cash (Last)	25	0.04	0.04	0.04
Corporate O/H	(21)	(0.03)	(0.03)	(0.03)
Total	795	1.33	1.59	1.37
Target Price		1.30		
TSR (%)		49%		
Recommendation		Buy		

Source: Ords Estimates using Bloomberg, Iress

Initiate with a Buy and \$1.30/sh target

Undervalued gold producer

Gold output to double by FY24/25

Free option on potential giant porphyry

Valuation sum of the parts: DCF + EV/Resource

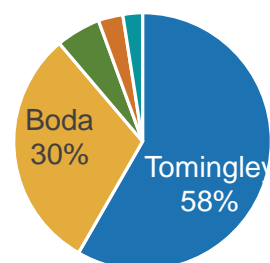
Net Cash \$27m,

Tomingley half our valuation

Limited hedgebook

Trading below NPV

Figure 2: Ords ALK Valuation Split



Financial Analysis

FY21 guidance of 50koz of gold at our price forecast of A\$2,288/oz (inc hedging cost of -\$237/oz) implies revenue of \$120m. We estimate cash costs of A\$1,241/oz which generates Ebitda of A\$56m at a healthy margin of 46% with NPAT of ~\$31m (5.2cps). Tomingley's \$37m of cash flow will all be allocated to increasing exploration as well as funding TGO growth. ALK has a clean balance sheet, with \$33m in cash and no debt, aside from \$8m of equipment finance leases.

Following the expansion of Tomingley in FY24/25 we expect gold production to increase to ~80koz at a 20% reduction in costs of A\$1,300/oz. This shifts earnings materially higher with an Ebitda of ~\$90m and asset free cash flow of \$80m.

Capital Structure

ALK has 595.4m ordinary shares on issue and 3.2m performance rights with a fully diluted share count of 598.6m. It has a market capitalisation of ~A\$500m, net cash of \$25m (Cash \$33m, \$8m in finance leases), bullion on hand \$5m and listed investments of \$46m. It has ample liquidity available with a A\$20m undrawn working capital facility.

The board and management own a collective 27% which is predominantly held by the chairman at ~25%. The passive gold junior ETF Van Eck holds 26m shares at 4.4%. Free float is ~62% with the stock predominantly held by retail investors with no other observable institutions.

Investment Risks

Investment risks in mining companies such as ALK span a range of potential categories including commodity price, foreign exchange, operational, infrastructure, permitting and potential impacts from Covid. Our valuation is most sensitive to:

- AUD/USD exchange rate with a $\pm 1\%$ change from our forecasts adjusting our FY21 Ebitda by 1.4% and our NPV by 1%
- Gold price change of 1% ($\pm \$15/\text{oz}$) adjusting FY21 Ebitda forecast by 1.5% and our NPV by 1%

Gold price downside risk is somewhat managed via a small hedging facility. Currently 14.3koz are sold forward over the next 18 months at an average price of A\$2,244/oz, which represents a minor revenue impact of -A\$3m.

Operational Risk – ALK operates an underground mine, which is subject to a range of operational factors that can impact production.

Development risk: Tomingley development rates may be insufficient to deliver required production rates.

Grade Risk – There is a risk that grade continuity may not be geologically consistent with the drilling results.

Resource risk – There is a risk that the amount of metal that is economic to mine may be less than we forecast.

Funding risk – There is a risk that due to variations in commodity prices, timing, or capex (among other reasons), ALK may find it more difficult to fund projects than we estimate.

Permitting – Government permitting in NSW is a complex and lengthy process. Depending upon the type of project it could take six months to several years to gain approval to commence production:

- Brownfield Modifications appear lower risk, along with projects that have minimal surface disturbance (i.e. underground mines)
- Greenfield mines can take years to approve, and require extensive modifications to comply (i.e. McPhillamys, Dargues).

Generating cash at a good margin

Asset cash flow of \$37m spent on exploration and growth

TGO growth by FY24/25 doubles cash flow

Clean balance sheet

Diluted share count of 598m

Chairman owns 25%

62% free float, no institutions

Mining is risky

Our val is most sensitive to A\$ Gold price

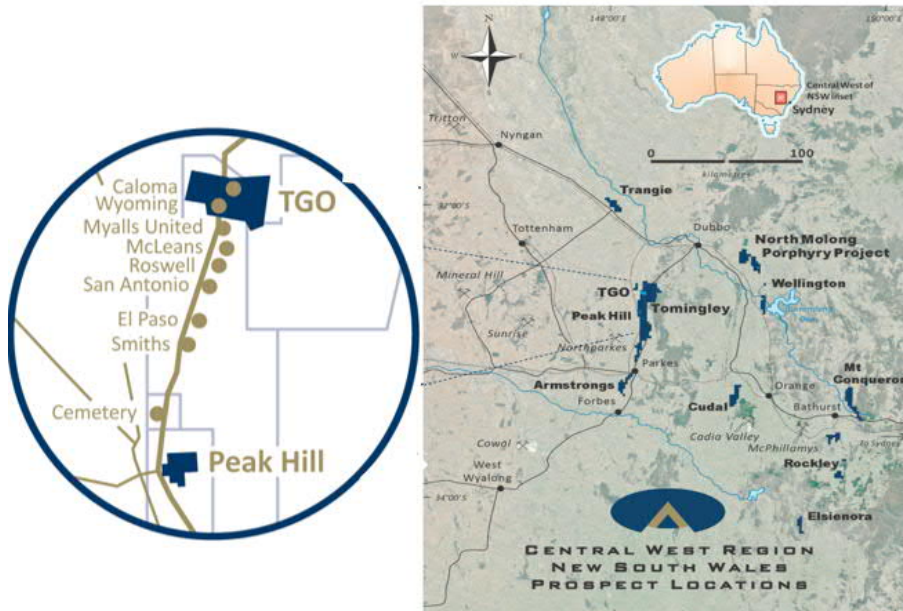
Risk categories
-Operational
-Exploration
-Funding
-Permitting

Government approvals can take years

Business Description

Alkane Resources Limited (ALK) is an ASX listed gold producer and exploration company operating in the Central West of New South Wales. The company owns the Tomingley Gold Project (TGO) and a pipeline of projects with the aim to become a multi-mine producer. Management have an excellent track record in exploration discovery (McPhillamys Gold, BCI Iron, Boda) and development of operational mines (Peak Hill, Tomingley).

Figure 3: Regional Map



Source: Company

ALK has a portfolio of regional NSW exploration projects focused along the corridor south of its Tomingley mine and previous project Peak Hill, but also includes Bodangora, Kaiser, Finns Crossing, Cudal, Peak Hill, Wellington, Elsenora, Rockley, and Orange East projects. Recent exploration focus has been on discovery of the Boda gold porphyry deposit east of Dubbo.

On July 30th, 2020, ALK divested its Rare Earth 'Dubbo' project into a new listed vehicle 'Australian Strategic Materials' (ASM.ASX) with a current market capitalisation of A\$616m.

As part of its strategy to become a multi-mine producer, ALK has been a cornerstone investor in two WA junior gold explorers:

- **Genesis Minerals (GMD.ASX) 19.9%:** WA focused gold explorer/developer with a 1.2Moz resource.
- **Calidus Resources (CAI.ASX) 10%:** developing the 1.5Moz Warrawoona Gold Project in the East Pilbara. Construction of the \$120m project is expected to commence in March 2021 (fully funded).

ALK is an ASX listed gold producer & explorer

HQ in Perth

Assets all in central NSW near Dubbo

One income producing asset Tomingley

Boda is a key exploration project

Well managed, excellent track record of discovery and development

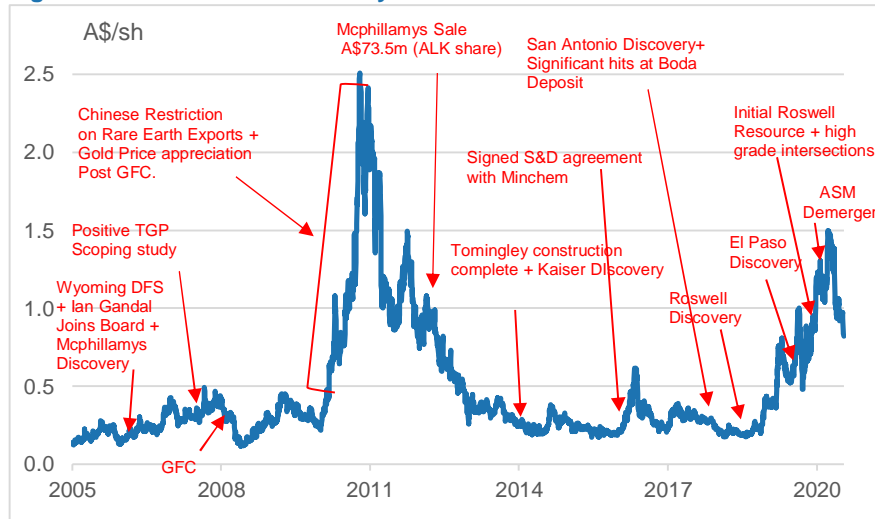
Found McPhillamys gold deposit (RRL)

Recently divested a complex + expensive rare earth project ASM

Aims to be a multi mine producer

Investing in WA gold juniors

Figure 4: ALK Price Chart History



Source: IRESS, Ords Estimates

Historical Timeline

- **1969** - Incorporation of Alkane
- **1980** - ASX Listing
- **1995** - Peak Hill mine commences
- **1998** –Initial test work on Dubbo speciality metals project (ASM)
- **1997** - Acquires North Molong Porphyry Project from CRA (Rio Tinto)
- **2001** - Tomingley gold discovery 50km south west of Dubbo.
- **2005** - Peak Hill gold mine ends and commences rehabilitation.
- **2006** - Discovery Year
 - McPhillamys gold discovery 35km east of Orange in NSW, initial intercept of 123m at 1.9g/t from surface. JV with Newmont Gold (Ticker: NGT.TSX).
 - Discovers iron deposit in the East Pilbara. Syndicate forms to create BC Iron (BCI) with ALK holding ~17%.
- **2010** – Project Development and US listing
 - **Tomingley DFS:** A\$95.4m capex, 1mtpa plant, 7.5yr mine life producing 52koz pa, A\$950/oz cost.
 - US OTC listing due to rare earth interest
 - McPhillamys Maiden Resource of 2.9Moz Au, 60kt Cu.
- **2012** - McPhillamys sold to Regis Resources (RRL) for A\$73.5m.
- **2013** - ASM DFS: A\$767m capex, 1mtpa over 20-year life producing speciality metals including rare earths, NPV of \$1.2 billion.
- **2014** – Tomingley 1st production, A\$116m cost, funded via sale of RRL shares with no debt.
- **2018** – Gold discovered south of Tomingley at San Antonio & Roswell
- **2019** – Discovery Year
 - Cornerstone investor in Genesis Minerals (GMD.ASX) A\$6m
 - Boda Discovery: Sep 9th ‘KSD003’ 502m @ 0.74g/t AuEq.
 - Underground mining commenced at TGO
 - El Paso gold discovery south of TGO, 11m @ 2.8g/t Au
- **2020** – Demerger
 - Maiden Resource: Roswell & San Antonio 1Moz
 - Demerger from Dubbo rare earth project (ASM.ASX)

Historic share price correlation to rare earths

Now tracks A\$ gold and Boda drill newsflow

Founded in 1969

ASX listing in 1980

First gold mine Peak Hill starts ‘95’

Acquires Boda project area from CRA ‘97’

Discovers McPhillamys gold ‘06’

Rare earth crisis sends share price soaring

ASM DFS released ‘13’

TGO 1st production ‘14’

Roswell & San Antonio discovery ‘18’

Boda Discovery ‘19’

ASM Demerger July ‘20’

Peer Comparison: Mixed

Relative to its ASX listed peer group, ALK screens as small and expensive. But in our view, this ignores near term growth potential from Boda and Tomingley which would materially improve ALK's position across several key metrics.

Boda & Tomingley will move key metrics

Figure 5: ASX Gold Peer Comparison

	M'Cap A\$m	EV A\$m	ND/E %	EV/Ebitda +1 Yr +2 Yr	FCF Yield (%) +1 Yr +2 Yr	Div yield % +1 Yr +2 Yr	Resource Moz	Reserve Moz	Rsv Life Years
RRL	1,889	1,735	(19)	3.7 3.7	14.4 20.7	5% 5%	7.7	3.6	10
SBM	1,587	1,513	(5)	3.0 3.0	21.8 23.5	3% 4%	11.6	6.0	16
OGC	1,647	1,908	11	3.4 2.8	4.2 14.8	1% 2%	9.4	5.3	15
SLR	1,499	1,295	(26)	3.8 3.6	21.5 23.7		6.1	1.0	4
PRU	1,453	1,463	0	2.8 2.1	28.9 51.2	1% 2%	3.2	1.5	6
GOR	1,065	1,133	29	6.0 5.8	12.3 11.6	2% 2%	3.6	1.9	8
RSG	767	1,055	20	3.2 3.0	21.0 27.8	3% 2%	13.3	4.7	11
RMS	1,258	1,146	(22)	3.9 3.5	12.6 15.5	3% 4%	4.7	1.1	5
WGX	1,000	901	(19)	2.3 2.6	19.0 25.2		8.8	2.6	11
ALK	500	469	(16)	11.5 5.1	6.3 7.2		1.8	0.2	3
AMI	506	441	(28)	2.2 2.3	23.5 2.6	4% 0%	3.1	0.8	6
RED	493	384	(54)	7.6 1.9	(18.1) 26.0		4.3	2.4	14
DCN	275	302	16	3.0 2.3	29.1 38.3		2.0	0.8	5
Peer Avg			(8)	4.3 3.2	15.1 22.2	3% 3%	6.1	2.4	8.7
<i>ALK vs Peer</i>			<i>(7)</i>	<i>165 59</i>	<i>(9) (15)</i>		<i>(70)</i>	<i>(93)</i>	<i>(65)</i>

Source: Bloomberg Consensus 13th Jan 2021 with Ords Edits

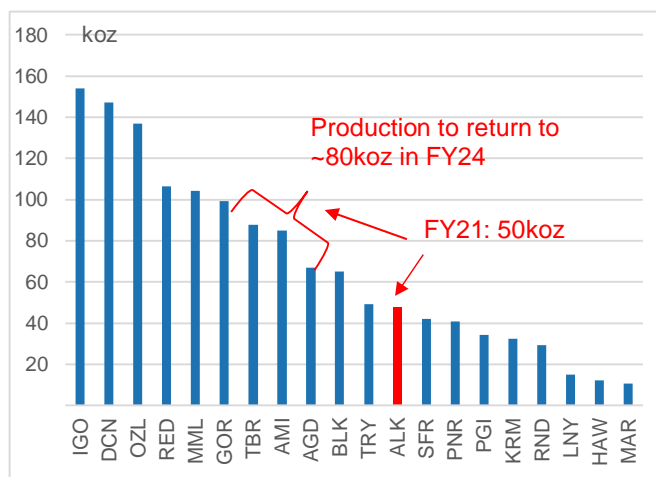
Appears small and expensive – if looking short term

- FY21 gold production guidance of 50koz is relatively small vs peers (Figure 6) but SAR should see this return to ~80koz by FY24/25.
- EV/Resource of A\$250/oz vs peers on A\$170/oz appears expensive, but the addition of Boda's high grade resource readjusts this to <\$100/oz. (Figure 7)
- Unit costs are at the higher end of the cost curve at A\$1,500/oz but growth should realign this back to its life of mine average A\$1,200/oz (Figure 9).
- Current reserves imply a limited life of ~3 years, well below sector average of 9 years. We believe the conversion of 18mt SAR resources into reserves will add at least a decade of mine life (Figure 8).
- ALK has a good balance sheet with net cash of A\$25m similar with peers.
- Hedge book is comparatively small at <1% of its market capitalisation.
- Trades on a consensus forecast of 5.5x EV/Ebitda vs peer on ~3.3x.
- We do not expect ALK to generate free cash flow or pay a dividend, with all cash expected to fund exploration and growth.

Appears small and expensive

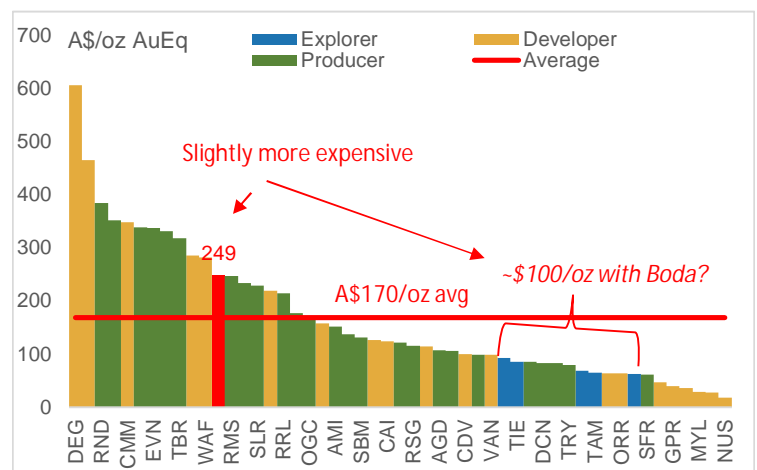
But addition of TGO and Boda can rapidly attractiveness

Figure 6: ASX Peer Gold Production



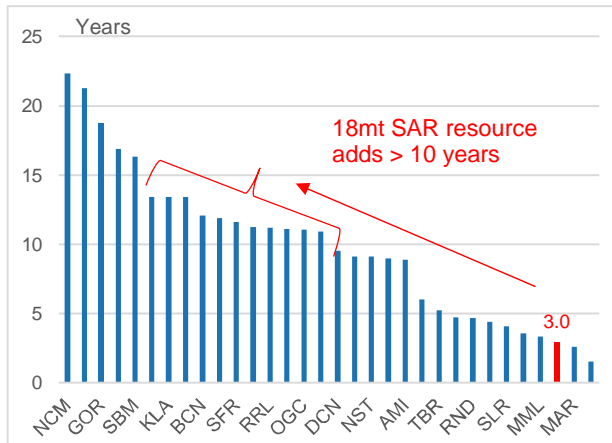
Source: Company, Bloomberg, Gold Nerds, Ords Estimates

Figure 7: EV/Resource (AuEq)



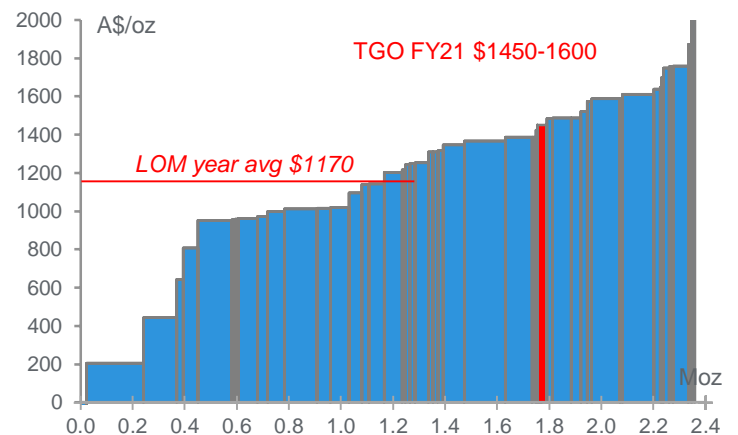
Source: Bloomberg, Gold Nerds, Company Filings with Ords Edits

Figure 8: Mine Life (Years)



Source: Bloomberg, Company Filings Gold Nerds, with Ords Edits, estimated by reserves ÷ annual production (oz)

Figure 9: Australian Gold All in Cash Cost (AISC) CY19



Source: Ords Estimates using Amrun Analytics, Opaxe, Company filings

Board & Management

Ian Gandel: Non-Executive Chairman

Appointed in 2006 and is ALK’s largest shareholder at ~25%. Ian is a well-known property developer and has been a prolific investor in the mining industry. He has been a director of the Gandel Retail Trust and has had heavy involvement in the construction and leasing of Gandel shopping centres.

Nic Earner: Managing Director

Nic Earner is a chemical engineer with 21 years’ experience in technical, operational optimisation and management and has held several executive roles in the mining industry. Nic joined ALK as COO in August 2013 and was appointed CEO in September 2017. Prior to ALK Nic spent four years at Straits Resources (AIS.ASX) as GM supervising three mining operations.

Ian Chalmers: Technical Director

Geologist with 50 years’ experience in exploration, project development and management. Ian was the CEO of ALK for 11 years (2006-2017). During his tenure he oversaw ALK’s development of Peak Hill, Tomingley and ASM. He was also responsible for the exploration teams that discovered McPhillamys and Boda.

Anthony Lethlean: Non-Executive Director

Geologist and former mining analyst appointed in 2002. A founding director of Helmsec Global Capital Limited which seeded, listed and funded several companies in a range of commodities. He is also a non-executive director of Alliance Resources Ltd (appointed 15 October 2003).

Gavin Smith: Non-Executive Director

Appointed November 2017, Gavin is the Australia and New Zealand executive for Bosch group. He has worked for Bosch for the past 28 years in a range of roles in Australia and Germany. He is the current Chair and President of Robert Bosch Australia and a non-executive director of the various Bosch subsidiaries, joint ventures, and direct investment companies.



Thesis Key Point 1: Tomingley Growth

Tomingley Gold Mine ('TGO' or 'Tomingley') is 100% owned by ALK and is their sole cash generating asset. We value the project at A\$493m or 82cps, which represents 60% of our valuation.

Following the discovery of San Antonio and Roswell ('SAR') in 2018, we expect the project can be rejuvenated over the next three years at a low capital cost of ~\$30m. We believe mine life will increase by over a decade and production to double at materially lower cash cost. Key risks include permitting and potential delays in relocating the local road.

Timeline & Catalysts

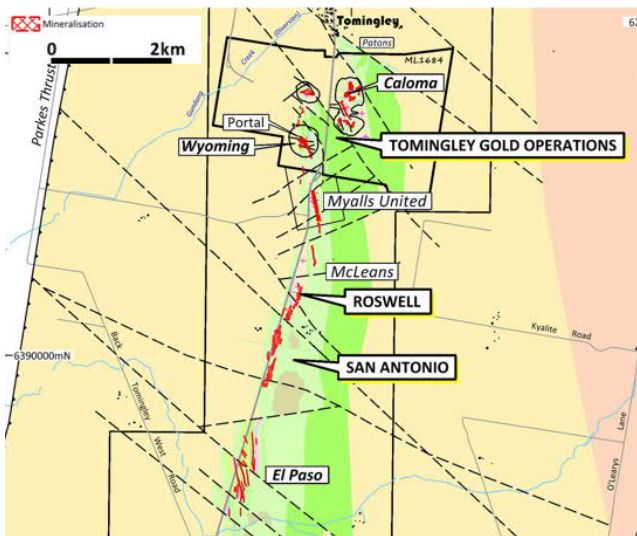
- Late Jan 2021: Updated San Antonio resource estimate.
- Feb 2021: Preliminary mine plans for both projects due in February 2021:
- EIS public viewing is expected to start in 1Q CY2021.
- Final state government approval expected to by mid-2021 or in a worst-case year end 2021.
- We forecast a conservative development timeline with works starting in late FY23 followed by 1st production in FY24.

100% owned gold mine near Dubbo in NSW

Valuation: A\$493m or 82cps

SAR pits can be developed at 'low capital cost ~\$30m

Figure 10: Regional Overview



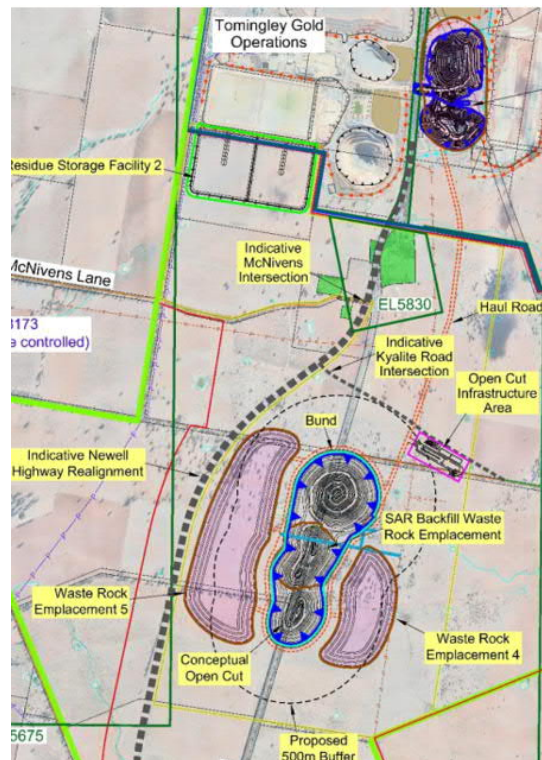
Source: Company with Ords Edits

San Antonio & Roswell ('SAR')

In 2018 ALK announced an exploration discovery directly south of the existing mine which demonstrated potential for future development. An intensive drilling program shortly followed that revealed a broad, shallow and high-grade gold mineralisation across two orebodies:

- **'Roswell'**: 2km directly south with ore under slightly deeper (30-50m cover) spread over a short strike length 600x100x350). Higher grade mineralisation extending at depth with clear underground potential.
- **'San Antonio'**: 4km directly south of the mine; is shallow (30m of cover) with minimal stripping required. Mineralisation is relatively higher grade across a large area at (1000x100x220).

Figure 11: Conceptual Layout of SAR



Source: Company with Ords Edits

Discovered in 2018

Large low cost opencut resource

In early 2020 maiden inferred resources were declared containing >1Moz. Further drilling by November 2020 had defined an 18mt resource at Indicated and Inferred category containing 1.1Moz at a grade of 1.9g/t gold.

Preliminary metallurgical test work indicates the SAR ore is similar to existing Tomingley, with test recoveries ranging between 92-94%. Tomingley's current processing plant is permitted up to 1.5mtpa and is currently underutilised, with a fresh ore capacity of 1mtpa. The plant can run higher on oxide ore up to 1.3mtpa, which could utilise the upper portion of San Antonio orebody.

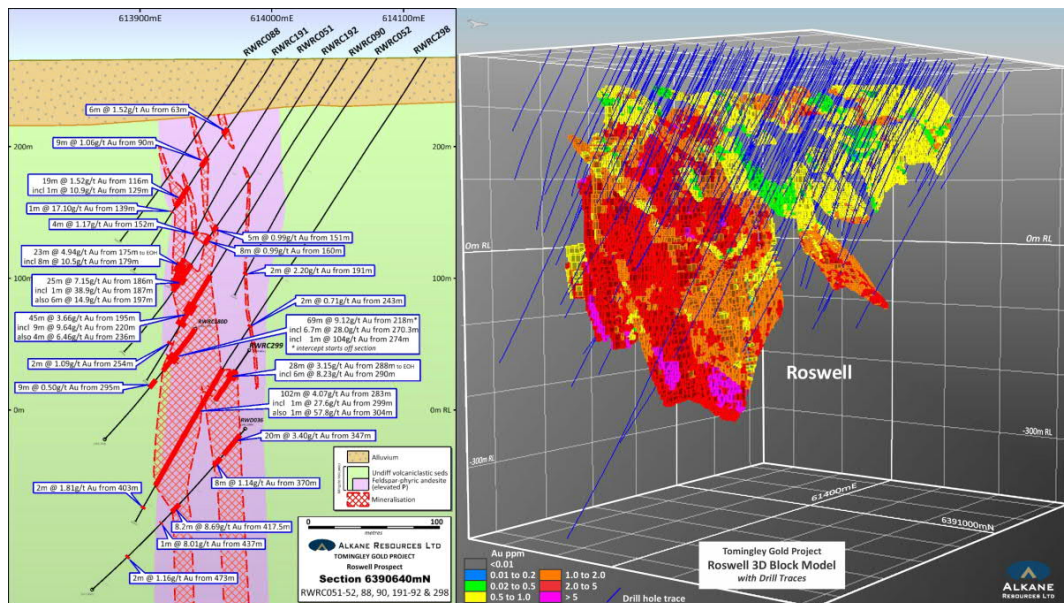
ALK has since released a preliminary development plan to develop a single large, open-cut operation combining both deposits into one with rough dimensions of 1.7km long, 700m wide and 300m deep (Figure 11). Plans have been submitted to the State Government for mining approval. We expect approval to be granted by mid-2021, but see risk of delays.

We see potential for SAR to be developed at a low capital cost of \$30m over the next three years. We forecast a mine inventory of 11mt @ 2.1g/t at a strip ratio of 10:1 (Waste tonnes: ore tonnes). This has several positive implications:

- **Gold production doubles** from 40koz and back to ~80koz due to:
 - Mill throughput increases by 15-30% to 1.0-1.3mtpa
 - Head grades increase ~25% from 1.6g/t to ~2.0g/t
 - Recoveries improve from 86% back to 92%
- **Lowers cost:** low strip surface mining at higher gold production rates sees a material 10-20% improvement in costs from A\$1,500/oz to <A\$1,300/oz.
- **Extends Mine Life:** by potentially over a decade from the current three years.

We flag that if permitting delays the open-cut schedule, the operation can bring forward underground development. The project does have an exploration decline underway from Wyoming underground 2km to Roswell. We believe the economics of lower tonnages are offset by access to the Roswell higher-grade ore at depth of 4-5g/t (Figure 12).

Figure 12: TGO – Roswell Cross Sections and Block Model



If permits are delayed, underground access underway

Source: ALK AGM Presentation

Resource of 18mt @ 1.9g/t containing 1.1Moz

Can process ore at 1mtpa TGO plant

Plans for a large single pit

Approvals needed by mid 2021.

Low capital cost growth

Gold production doubles to 80koz

Lowers costs

Adds a decade to mine life

TGO Background

Tomingley Gold Mine is a 1mtpa gold mine located 50km southwest of Dubbo in central-western NSW. Tomingley project covers an area of approximately 440km² stretching 60km north-south along the Newell Highway from Tomingley in the north, through Peak Hill and almost to Parkes in the south.

Since being discovered in 2001, the project was progressively developed with the 2010 DFS outlining:

- Opencut mine with a strip ratio of 7.6:1 (6mt at 1.9g/t).
- 1.0-1.3mtpa CIL plant at a 93% recovery
 - Fresh ore capacity 1mtpa
 - Oxide capacity 1.3mtpa.
 - Permitted up to 1.5mtpa
- 7.5 year life producing ~50koz pa
- A\$95m capex cost with opex of A\$53/t and an AISC A\$942/oz

Since commissioning the project has broadly achieved the DFS outline as well as being a consistent producer and cash generator. Output has averaged 1mtpa at a 91% recovery with grades of 2.0g/t producing 57koz pa. On average it has generated \$34m of Ebitda and \$30m in free cash flow with ranges between \$15m to \$50m.

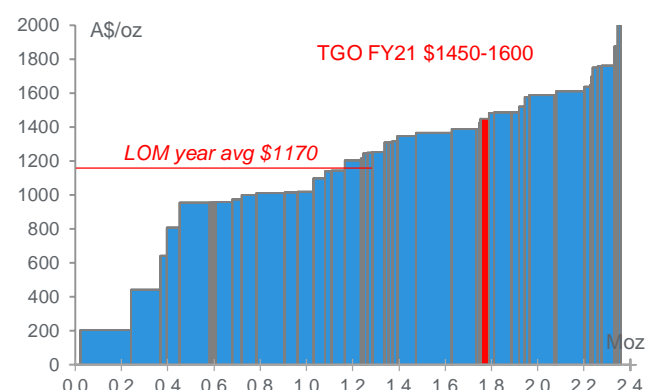
The two surface deposits of Wyoming and Caloma were extracted in four sequences: Wyoming Three (2013-2015), Caloma One (2015 - 2017) Wyoming One (2019), and Caloma Two (completed 2019). One surface cut back at Coloma remains and is currently being developed at a 13:1 strip ratio (waste bcm : ore bcm) containing 29koz (0.57Mt @ 1.6g/t).

Production peaked in FY18 at 78koz when head grades reached 2.4g/t and the processing plant was running at full 1mtpa capacity. From 2019 the Opencut mine life ended and operations began transitioning underground at a run rate of 800-850ktpa.

The last reserve and resource statements were as follows:

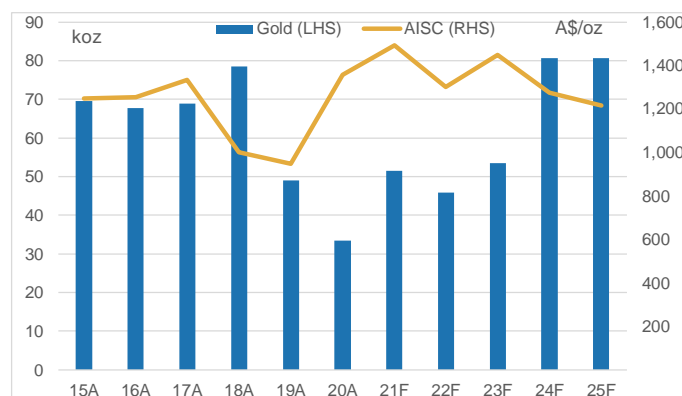
- Resource: 610koz (9.4mt @ 2.1g/t)
 - Opencut: 1.35Moz (22.9mt @ 1.8g/t) at 0.5g/t cut-off.
 - Underground: 406koz (4.5mt @ 2.6g/t) at 1.3g/t cut-off.
- Reserve: 176koz (3mt @ 1.8g/t) implying a limited 3-year life.
 - Underground: 140koz (2.2mt @ 2g/t) at 1.3g/t cut off
 - Opencut: 234koz (4.9mt @ 1.5g/t) at 0.5g/t cut off

Figure 13: Cash Cost (AISC) Comparison (CY19)



Source: Ords Estimates using Amrun Analytics, Opaxe, Company filings

Figure 14: TGO Gold Production & Costs



Source: ALK Filings and Ords Estimates

Young greenfield mine in central NSW

Discovered in 2001

DFS in 2010

1st production 2014

**DFS 2010:
-95m Capex
-50koz p.a
-93% recoveries
-Mining inventory
370koz**

**Production peak FY18 –
78koz @ 2.4g/t**

Consistent producer and cash generator

Figure 15: TGO – Roswell Cross Sections and Block Model

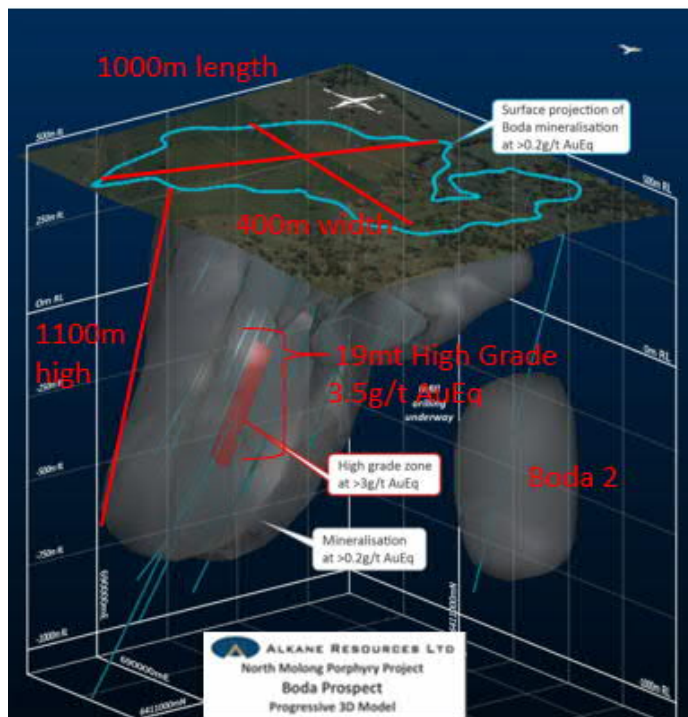
Tomingley Gold Mine (TGO)		LOM	14A	15A	16A	17A	18A	19A	20A	21F	22F	23F	24F	25F	26F	27F	28F	29F	30F
Opencut																			
Strip Ratio	x	9.9	22.4	9.2	12.2	16.6	5.4	4.4		149.2	2.0	10.6	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Ore Mined	kt	11,989	546	1,386	1,285	1,223	1,590	391		23	569	500	1,300	1,200	1,200	1,200	1,000	1,000	1,000
Gold Grade	g/t	2.1	1.4	1.7	1.8	2.1	2.0	1.7		0.40	1.6	2.0	2.1	2.1	2.1	2.1	2.0	2.0	2.3
Underground																			
Ore Mined	kt	112						9	341	762	500	500							
Gold Grade	g/t	2.00						1.12	2.38	2.30	2.00	2.00							
Processing																			
Ore Milled	kt	1,060	359	1,141	1,096	1,088	1,093	999	839	990	900	950	1,300	1,300	1,200	1,100	1,000	1,000	1,000
Gold Grade	g/t	2.11	2.24	2.01	2.08	2.15	2.42	1.66	1.45	1.85	1.80	1.90	2.10	2.10	2.10	2.10	2.00	2.00	2.30
Recovery	%	91.6	91.4	93.9	90.9	91.5	91.9	91.9	85.8	87.2	88.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
Gold Produced	koz	65.9	20.7	69.6	67.8	68.8	78.5	49.0	33.5	51.5	45.8	53.4	80.7	80.7	74.5	68.3	59.2	59.2	68.0
Gold Sold	koz	66.0	16.4	70.7	68.0	69.9	75.5	52.1	33.0	53.4	46.0	53.5	80.7	80.7	74.5	68.3	59.2	59.2	68.0
Operating Cost																			
Opencut	A\$/t	3.9	1.6	3.5	2.9	2.5	3.7	5.5					4.0	4.0	4.0	4.0	4.0	4.0	4.0
Underground	A\$/t	34							27	31	35	35							
Processing	A\$/t	20	24	20	18	19	17	20	21	20	20	20	20	20	20	20	20	20	20
Total	A\$/t	75	92	75	76	84	70	44	46	60	58	56	77	74	78	83	80	80	80
Cash Cost	A\$/oz	1,207	1,599	1,223	1,225	1,324	970	905	1,152	1,241	1,134	997	1,246	1,187	1,253	1,332	1,345	1,345	1,178
AISC	A\$/oz	1,290	1,604	1,249	1,256	1,335	1,002	948	1,357	1,492	1,302	1,450	1,277	1,218	1,287	1,368	1,387	1,387	1,215
Commodity Price & FX Forecast																			
AUDUSD	x	0.70	0.83	0.83	0.72	0.75	0.77	0.71	0.67	0.74	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Gold	US\$/oz	1,600	1,223	1,223	1,167	1,257	1,297	1,264	1,563	1,867	1,800	1,702	1,702	1,600	1,600	1,600	1,600	1,600	1,600
Realised Price (inc Hedges)	A\$/oz	2,325	1,421	1,441	1,605	1,678	1,706	1,777	2,197	2,291	2,567	2,431	2,431	2,286	2,286	2,286	2,286	2,286	2,286
Financials																			
Revenue	A\$m	1,918	23	102	109	117	129	93	73	122	118	130	196	185	170	156	135	135	155
Ebitda	A\$m	854	(10)	17	26	26	53	48	34	56	66	77	96	89	77	65	56	56	75
Sustaining Capex	A\$m	68	0	2	2	3	3	2	7	19	8	24	3	3	3	3	3	3	3
Site FCF	A\$m	786	(10)	15	24	23	50	46	27	37	58	52	93	86	74	63	53	53	73

Thesis Key Point 2: Step 2: Boda - Think BIG

Boda is an exploration project located 35km east of Dubbo in central NSW. Since discovery 14 months ago in September 2019, ALK have defined a large area of low-grade mineralisation with a high-grade core. Its only early days and it will take several years to drill, define and ultimately build a project. However, we take considerable comfort that a high-grade ore zone was quickly identified that could focus and shorten a development timeline.

We value Boda at ~\$251m (42cps) which assumes only a small 1.5Moz high grade core is defined and applying an EV/Resource of \$170/oz. However, our analysis of other porphyry systems leads us to believe there is a high probability of significant further exploration discoveries over the medium term. This is particularly the case as managements knowledge and understanding evolves and accelerates where to target/drill nearby 'look alike' structures. In the short term, catalysts include drilling results newsflow, which will see an increase following the addition of a second drill rig. extension drilling at Boda 2 and Kaiser. Watch this space.

Figure 16: Boda Mineralisation 3D Model



Source: Company with Ords Edits

Big Lode with High Grade Core

Since discovery in September 2019, ALK has defined a large area of low-grade mineralisation (>0.2g/t AuEq) which spans 1000m in length, 400m wide and 1100m high (see **Error! Reference source not found.**).

In March 2020, diamond drill hole 'KSDD007' yielded the best result to date with 1,167m at 0.83g/t AuEq (see [Figure 17](#)). This hole ranked as one of worlds biggest Cu-Au drill results in many years (Figure 30: Top 24 Cu-Au Intercepts (Since 2018) page 22. Critically at a depth it also intercepted 97meters at @ 5.9g/t AuEq (4g/t Au, 1.5% Cu). This result is important as it:

- 1) Comparable in both length and grade to NCM's Ridgeway discovery hole in 1994 (NC498 145m @ 5.8g/t AuEq from 598m).
- 2) Has a high-grade zone and a large consistent body of mineralisation which are key attributes needed to show this has the potential to be a future mine

Large and consistent high-grade mineralisation

Bodes well for a future mine

It's too early but it may host 19mt @ 3.5g/t AuEq containing 1.5Moz

Its very hard to value

EV/Resource is a start

Exclude low grade

Likely conservative

Could contain 1.5Moz

Hidden from surface 'blind deposit'

6 months post discovery Hole #7 hit 97m @ 5.9g/t AuEq

Comparable to NCM Ridgeway discovery: 145m @ 5.8g/t AuEq

Figure 17: Boda Exploration High Grade Zone

KSDD007	1,167m @ 0.55g/t gold, 0.25% copper from 75 metres
incl	512m @ 1.00g/t gold, 0.44% copper from 688 metres
incl	376m @ 1.30g/t gold, 0.56% copper from 768 metres
incl	96.8m @ 3.97g/t gold, 1.52% copper from 768 metres

Source: ALK March 2020 update

Its early days / But holds a few million ounces

With so few drill holes in the zone to date, it is too early to speculate on the ultimate size, dimension and grade of the resource. However, ALK has since gone on to identify and target a high-grade zone >3g/t AuEq within the low-grade mineralisation with dimensions of 150x100x500m.

Based on the information to date, we roughly estimate an orebody of 19mt could be defined at grade of 3.5g/t AuEq. Assuming a 70% metal recovery for dilution and processing losses we believe it could contain 1.5Moz of AuEq recoverable metal.

Not easy to value

We value the contained 1.5Moz metal on an EV/Resource of A\$170/oz which is the average value for gold producers, explorer and developers (Figure 7 page 8). This equates to \$251m or 42cps.

Our assumptions are likely conservative, and excludes all other mineralisation found to date. As drill information is released, we will refine our estimates and update accordingly. We suggest investors consider the range of outcomes in the sensitivity table on Figure 17.

Figure 18: Ords Boda Valuation

	Ore	Grade	Metal	\$/oz	Valuation
	Mt	g/t AuEq	Moz AuEq	A\$/oz	A\$m
High Grade	19	3.5	1.5	170	251

Source: Ords Estimates

Porphyry Analysis & Case Studies

We analysed the technical literature regarding porphyry camps as well as compiled case studies for nearby projects Cadia and Northparkes:

- Appendix 2: Porphyry 101 page 23
- Appendix 3: Case Study - Cadia page 29
- Appendix 4: Case Study - Northparkes page 31

There are seven key observations and comparisons for Boda including:

1. Extremely hard to find

Boda was extremely difficult to find and was the culmination of decades of exploration efforts. We believe the probability of for a 'World Class' and 'Major' discovery for a Junior miner is between 0.09-0.42% (Bartrop & Guj 2009 [here](#)).

Similar to other Macquarie Arc deposits, Boda was hidden from surface ('blind') and found after drilling at considerable depth, with an initial drill hole >1km deep. This is the first Macquarie Arc last porphyry discovery in ~27 years since the Newcrest ('NCM') Cadia, some 110km south. Whilst more complex than Cadia, Boda has similar sequence/rock type and mineralisation.

2. Found by Mistake / Best is later

Mistaken discovery

The best is found later

Giant deposits can host billions of tonnes

At low to medium grades

Average grade is 0.6g/t AuEq containing 15Moz AuEq

Figure 19: Boda Valuation Sensitivity \$/sh

		EV/Resource (A\$/oz)			
		100	150	200	400
Metal Moz AuEq	1.0	0.17	0.25	0.33	0.67
	2.0	0.33	0.50	0.67	1.34
	3.0	0.50	0.75	1.00	2.00

Source: Ords Estimates

We looked at porphyry technical literature

And compiled case studies for nearby mines

Extremely hard to find

Last was Cadia 27 years ago

Discoveries often appears to be found by mistake and when looking for something else. Curiously the largest (and best) deposits do not appear to be found first, as is normally the case.

3. Size matters: Think BIG - Clusters & Districts

Dimensions: Mineralisation typically spans areas of 2km in length, 800 metres wide, 1km in height and are found at depths between surface and 3.6 km. Size matters as the larger the footprint the larger the endowment. Giant deposits spans ~7-10km in length and 5km wide.

Giant Size at Low-Medium Grade: Porphyries typically host very large orebodies at low to medium grades but vary considerably:

- **Top Decile:** mean resource is 2,200mt at 1.3g/t AuEq containing ~100Moz AuEq (0.8% copper, 0.25g/t gold and 0.05% Moly) .
- **Comparable projects:** there are 81 copper/gold only porphyry's containing <1,000mt. The mean size is 424mt at 1.02g/t AuEq containing 14Moz AuEq (0.47% Copper, 0.39g/t Au).

Figure 20: Porphyry Camp Analysis vs NSW Macquarie Arc

	Deposits		Resource					Orebody Dimensions			
	Primary No.	Other* No.	Ore mt	Gold g/t	Copper %	AuEq g/t	Gold Eq Moz	Length metres	Width metres	Height metres	Depth metres
USGS Data Base											
World Average	884	865	750	0.05	0.45	0.62	15	2,000	1,500	800	0 - 3600
Top 10%	84	252	2,225	0.25	0.80	1.33	95	1,760	760	1,230	200-1800
Cu-Au Only (<1Bt)	81		424	0.39	0.47	1.02	14				
Macquarie Arc - Alkalic Porphyry											
Cadia	4	3	1,480	0.45	0.29	0.81	49	2,000	600	1,900	200
Northparkes	5	10	483	0.20	0.55	0.84	13	200	320	>1000	230
Boda	1 (?)	?						1,000	400	1,100	

Source: USGS 2008, Sinclair 2007, Company Data using last available resource statements. Metal Equivalent calculation methodology contained in glossary. *Other is number of deposits <10km away.

'Districts' 2-10km: Deposits are formed in clusters and are typically grouped under a '2km rule' in spatial proximity (Figure 21). Additional deposits are known to occur within 2-10km of the primary porphyry camps in a 'district'.

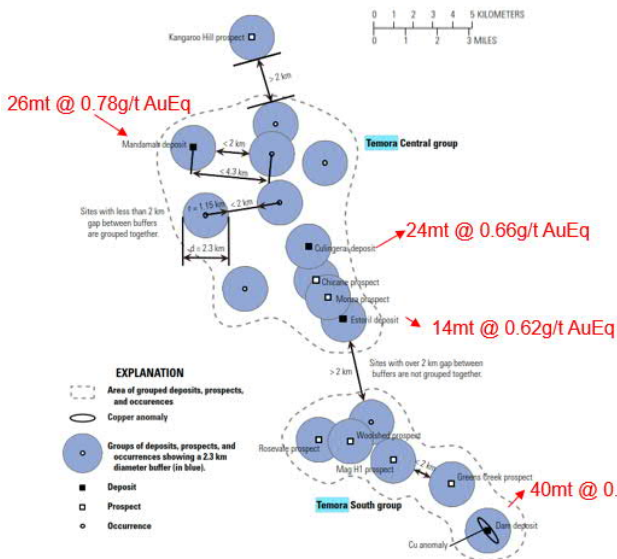
USGS databases indicate that 62% of camp's have at least two other deposits nearby that are not already included in the 2km rule. While the grades and tonnage are not specified, we highlight the breakdown of deposit types: 33% are other porphyries, 21% Skarns, 15% Epithermal. Other Macquarie Arc districts host over a dozen systems, such as Northparkes, which has 15 deposits spread within 6km of the primary camp, only five of which have been mined.

Deposits cluster

2km rule used to group them

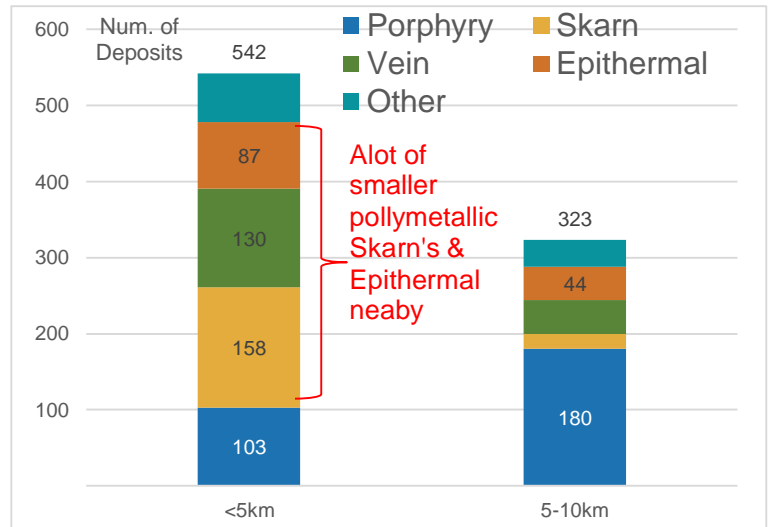
Most camps report at least two other deposits nearby

Figure 21: Applying 2km rule to Temora Porphyry District



Source: 'Porphyry Copper Assessment of Eastern Australia' 2010, USGS, Geoscience Australia with Ords Edits

Figure 22: Other ore deposits by type and distance from main camp



Source: USGS 2005 with Ords Edits, Other Deposits include Placer (28), Replacement (36), Sedimentary

4. Low grade surplus

In our view it appears that once discovered, there is a surplus of low-grade mineralisation. In NSW there are >20 alkalic porphyry camps hosting combined 4,700mt at a low grade of 0.65g/t AuEq (Figure 23). For example Temora district in (SFR.ASX) district hosts 18 deposits with a combined 239mt at 0.64g/t AuEq. With the ore value likely <US\$30/t, economic development is unlikely. Maiden Resource statements often underwhelm investors due to the billions of tonnes of lower grade material being defined at a lower cut of 0.3-0.6% CuEq.

5. Need High Grade Core

The challenge for exploration teams is quickly identifying high-grade zones of mineralisation that yield genuine potential for economic development. Discoveries in recent years all appear to prioritise these zones in company communications, flagging it as the most likely path to development:

- **Solgold (SOLG.LSE)** Cascabel project in Ecuador was discovered in early 2016. A maiden resource was quickly defined in Jan 2018 containing 1,080mt at 0.68% CuEq (0.3% CuEq cut off) including a high-grade core of 120mt at 1.8% CuEq. A preliminary Economic Assessment in Nov 2019 defined high grade core 442mt at 1.5% CuEq development option within a larger 2,600mt resource (Figure 24).

6. Brownfield Follow Up Delayed

Timing between initial discovery and the next brownfield takes time often several years (if at all). Northparkes was relatively quick, making four additional discoveries less than 4km away in the first 18 months. The giant Cadia East surface deposits were found two years after Cadia Hill, while the deep Ridgeway was found four years later.

We observe that post discovery, efforts tend to be focused on drilling out what has already been found. Following up on regional drill targets can often take years depending upon the capital and resources available at the time.

More recently it appears technology advances have accelerated regional efforts. Advanced geochemical analysis, magnetics, IP and TEM appear to generate nearby 'look alike' structures.

More low-grade material than you can poke a stick at

Needs high grade to be economic

Takes years to follow up on regional targets

The biggest and best deposits often found later

Ridgeway found four years after Cadia Hill

7. Takes years to develop

It can take several years between discovery and ultimately production. ‘Cadia Hill’ appears the quickest at five years, while Northparkes took 15 years.

Often high-grade zones occur at depth of >1000 metres which if drilled from surface slows access and raises costs. Development appears to have been accelerated in many instances via an exploration decline which are later used as for production access. If required, we believe ALK could sink an exploration decline for A\$30m.

Cadia Hill five years between find and build

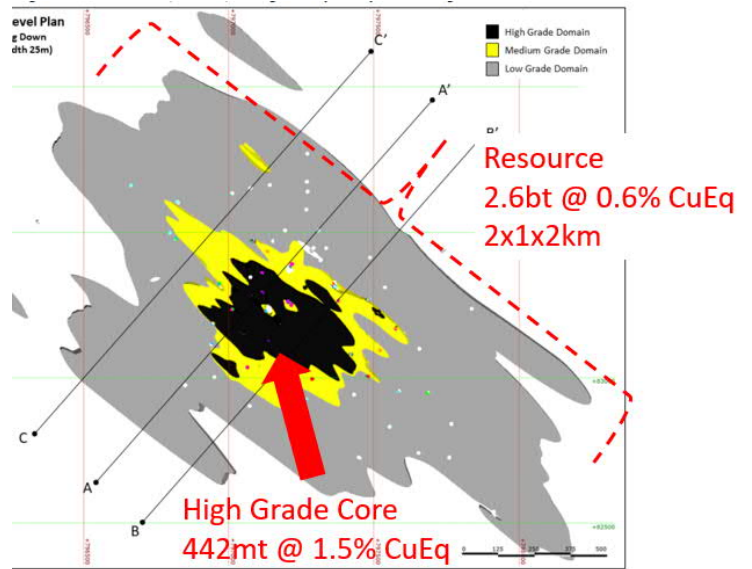
Depth slows it down

Figure 23: NSW Alkalic Porphyry Resource

Owner	Deposit	Ore Resource mt	AuEq g/t	
NCM	Cadia Valley	Cadia East	3,170	0.66
		Ridgeway	154	1.18
		Cadia Hill	490	0.26
		Cadia Far East	63	0.56
		Cadia Quarry	50	0.27
ChinaMoly	Northparkes	E-26	87	1.36
		E-48	33	1.80
		E-22	19	1.44
		E-27	14	1.56
		E-37	7	0.79
		E-28	8	0.45
		E-31N	7	0.80
SFR	Temora	Dam	40	0.76
		Culingera	24	0.66
		Estoril	14	0.59
		Mandamah	26	0.78
		Yiddah	127	0.51
		Gidginbung	8	1.60
EVN	Marsden	180	0.64	
Other	Copper Hill	133	0.68	
Other	Racecourse	28	0.52	
Other	Cargo	27	0.23	
NSW w/Avg		4,709	0.65	

Source: Company Filings, USGS 2010,

Figure 24: Alpala Mineralisation Cross Sections



Source: Solgold Ni43-101 Report PEA November 2019

Next Steps for ALK

Not Cheap – Calm and considered approach

It can cost over A\$0.25m to drill deep diamond drill holes. ALK management indicates they want to spend as much as it can afford, but in a sensible and considered approach. We believe they can spend ~\$15m annually over the next three years. When Tomingley growth comes online after FY24 we believe they could fund Boda exploration at a rate of \$25-30m which could fund a decline and or advanced feasibility studies.

Can afford 1.0-2.0Mtpa plant ~A\$150-300m

What could ALK develop?

It is too early on in discovery to make estimates on how big Boda’s resource could be and its capital requirements to build. However, in our view ALK could develop a smaller scale underground mine utilising the ‘sub level open stoping’ mining method.

We roughly estimate it could afford a 1.0Mtpa to 2.0Mtpa operation (90-190koz AuEq) at a capital cost of ~A\$150-300m. Over >2.5Mtpa capital costs accelerate north of \$400mn possibly beyond ALK’s current capability (Figure 25).

Following the release of Tomingley’s mine plans in late February 2021, we should have a clearer view on how much cash will be generated and assist in funding any development.

Figure 25: Boda Development Scenario

Scenario	No.	1	2	3
ROM	Mtpa	1.0	1.5	2.0
Grade	g/t AuEq	3.5	3.5	3.5
Recovery	%	0.85	0.85	0.85
Gold Eq Output	koz pa	96	143	191
Capex	A\$m	150	225	300

Source: Ords Estimates assuming A\$150/t capital intensity

Appendix 1: Boda 101

Northern Molong Porphyry Project ('Boda')

The Northern Molong Porphyry Project (NMPP) is a 100% owned exploration area covering 110km², some 35km east of Dubbo in central NSW. The project area is located within the northern Molong Volcanic Belt, which is part of the Eastern Lachlan Orogen.

Five distinct intrusive complexes have been identified over a 15km corridor: Kaiser, Boda, Comobella, Driell Creek and Finns Crossing. The Boda and Kaiser prospects have returned the most significant intercepts, with a target zone mapped over a strike length of ~5km and ~1km wide corridor.

Boda contains similar stratigraphic sequence/rock type to the geology of nearby deposits such as Cadia Valley (110km to the south) and Northparkes (400km North west) with Phase 4 Macquarie arc rocks.

100% owned

Boda/Kaiser target zone ~5km wide + ~1km Length corridor

Similar geography to Cadia/Northparkes

Figure 26: Boda Regional Geology

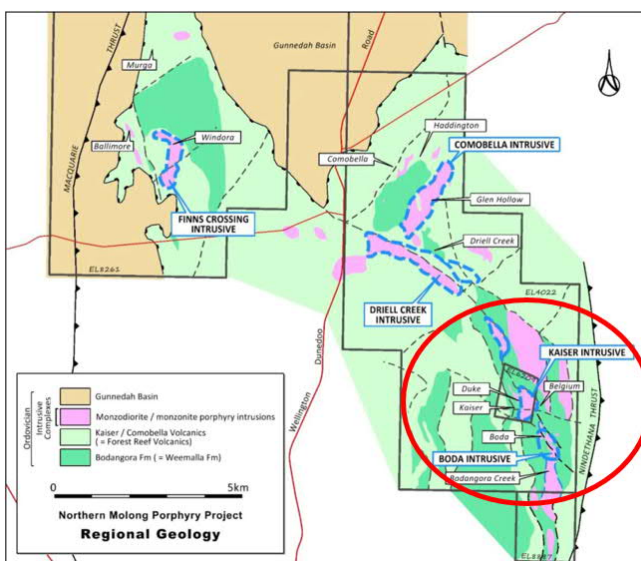
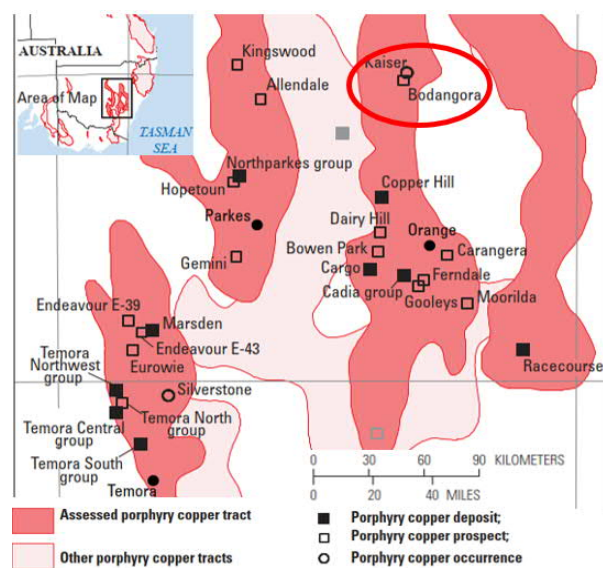


Figure 27: Macquarie Tract Porphyry copper occurrences



Source: Company

Source: USGSL Porphyry Copper Assessments of Eastern Australia

Regional Setting: Macquarie Arc & Phase 4

Phase 4 was a brief geological period (439 and 435 million years ago) which occurred at the end of the Macquarie Arc subduction of a tectonic plate. This system ejected huge amounts of Cu-Au (reasons unknown) that likely created Cadia, Northparkes and the more recently discovered Boda.

The Macquarie tract includes permissive rocks for porphyry copper deposits in the Macquarie Arc. The Macquarie tract contains more than 20 significant porphyry Cu-Au prospects, about half of which are spatially grouped with known deposits under the 2km rule (discussed below).

The Macquarie Arc consists mostly of volcanic rocks with subordinate sedimentary interlayers, and minor subvolcanic intrusions. Permissive intrusions are mapped in only about 1.3 percent of the surface area. Most of the spatially independent prospects have best intercepts of 20 m or more at an average copper grade of at least 0.15% Cu.

This tract also contains Cu-Au skarn and epithermal deposits of which are known to be spatially associated with porphyry copper systems.

Boda geology created in same era as other great discoveries in the era (Phase 4 Macquarie Arc)

Volcanic rocks with minor subvolcanic intrusions

Highly Prospective for Copper Porphyries

According to a 2010 USGS study ([here](#)) the Macquarie Arc is highly prospective for copper porphyries:

- Estimated to have ~6.9 (±3) yet to be discovered deposits <1km from surface
- Estimated total ore tonnage of 4,300mt at 1g/t AuEq (0.35g/t gold, 0.50% copper) with a mean probability of 36%.

History

ALK has been exploring and developing gold projects in central NSW for several decades and developed projects including Peak Hill & Tomingley. It was also responsible for the exploration discovery of the 2Moz McPhillamys gold project now owned by Regis Resources (RRL).

Boda has been over 10 years in the making through ALK's painstaking and meticulous exploration efforts. Although extensive work had been completed by previous explorers, ALK embarked upon a program to reconstruct the geology in the region using detailed mapping, re-assessment of existing aeromagnetic data, relogging of existing drill core and systematic but strategic use of detailed geochemical analysis.

Although structurally more complex than the Cadia Valley area, work has shown that a stratigraphic sequence very similar to that at Cadia Valley exists within the project area, and that mineralisation is hosted by very similar rock types at very similar stratigraphic positions.

The rough timeline to discovery:

- 1997: The project area acquired in 1997 from CRA (now Rio Tinto).
- 2012: Bodangora project area identifies several key geological features associated with porphyry style Cu-Au mineralisation within the Combobella Intrusive Complex (CIC). CIC is a 4km x 6km monazite intrusive and skarn mineralisation located 7km west of Kaiser.
- 2014: drill program comprising 7 holes over 1,672m
 - RC Drilling at Kaiser intercepts 60m at ~0.2g/t AuEq
- 2015: Zone of porphyry style Cu-Au mineralisation at Kaiser prospect:
 - KSRC010: 112m 0.70g/t AuEq
- 2016: 1,761m RC drilling project in Boda area confirms extensive Cu-Au mineralisation.
 - KSRC013 – 111m @ 0.71g/t AuEq from 42m
 - KSRC018 – 311m @ 0.38g/t g/t AuEq from 19m
- 2019: September Discovery Hole: first and only deep hole (770m) at Boda 'KSD003' intercepts 502m at 0.74g/t AuEq from 220m.
- 2020:
 - February: KSDD005 intercepts of 1,167m grading 0.87g/t AuEq.
 - July: 30,000m drill program commences
 - October: Second high capacity diamond drill rig mobilised test the strong conductive IP anomaly at Kaiser and targets at 'Boda Two'.

USGS study confirms it as a highly prospective area for economic deposits

ALK well acquainted with area – have been exploring for decades.

Boda has been 10 years in the making.

1997: discovered by CRA (Rio Tinto)

2012: Bodangora project identifies key porphyry style Cu-Au mineralisation

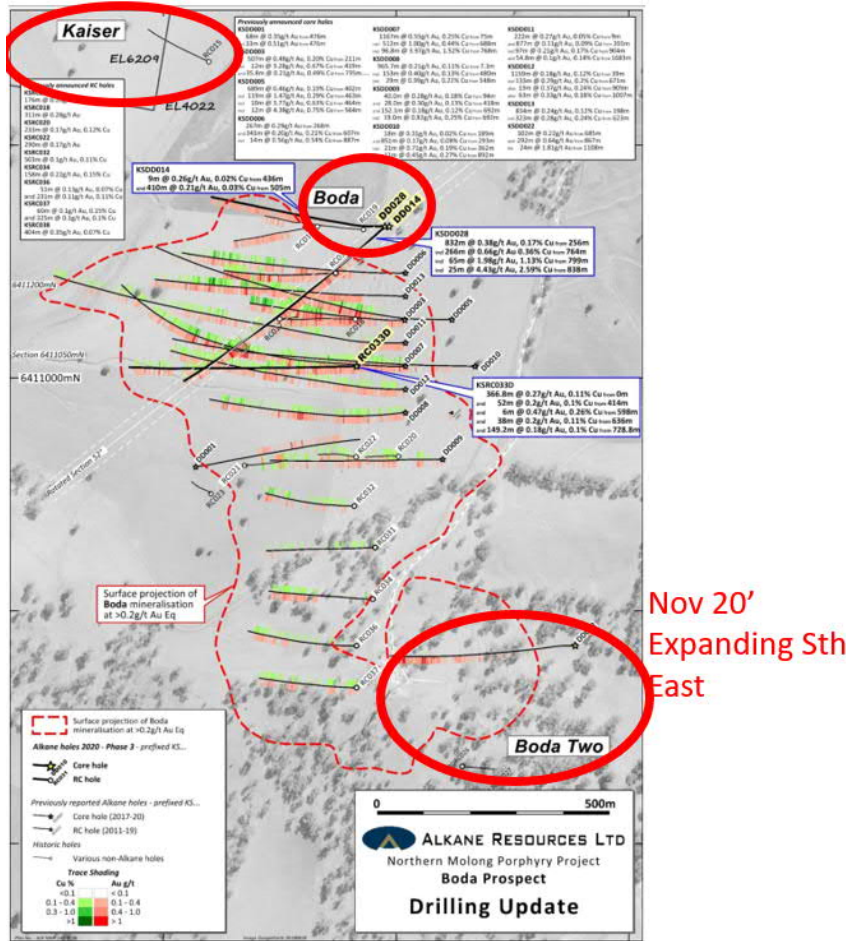
2014: Kaiser drill 60m at ~2g/t AuEq

2016: Boda drill 111m @ 0.71 g/t AuEq Eq from 42m

2019: Boda deep drill 502m @ 0.74 g/t AuEq Eq from 220m

2020: Boda drill 1,167m @ 0.87 g/t AuEq.

Figure 28: Boda Drilling Overview



Source: Company with Ords Edits

Discovery Impact

Following the discovery in September 2019, ALK's market cap doubled to A\$400mn (Figure 29) along with several other nearby junior explores increasing five-fold who raised \$90m in new equity. Follow up drilling intercepted 1,167m at 0.87g/t AuEq, making it comparatively the top 3 largest Cu-Au intercepts globally since 2018 (Figure 30),

Figure 29: ALK Share Price vs Boda Newsflow



Source: Iress with Ords Edits (Grey denotes other observations)

Figure 30: Top 24 Cu-Au Intercepts (Since 2018)

Project	Country	Ticker	Intercept Meters	Gold g/t	Copper %	AuEq g/t	AuEq/m
1 Cascabel	Ecuador	SOLG.LON	1,918	0.19	0.41	0.67	1282
2 Tatogga	Canada	GTT.TSX	1,206	0.57	0.26	0.87	1053
3 Boda	Aus	ALK.ASX	1,167	0.55	0.25	0.84	982
4 Altar	Argentina	ALDE.TSX	1,055	0.20	0.50	0.78	826
5 Cascabel	Ecuador	SOLG.LON	1,028	0.91	0.71	1.74	1787
6 Cascabel	Ecuador	SOLG.LON	1,028	0.90	0.70	1.72	1,765
7 Cascabel	Ecuador	SOLG.LON	974	0.40	0.50	0.98	958
8 Cortadera	Chile	HCH.ASX	972	0.20	0.50	0.78	761
9 Cascabel	Ecuador	SOLG.LON	853	0.60	0.50	1.18	1,009
10 Cascabel	Ecuador	SOLG.LON	852	0.60	0.80	1.53	1,306

Source: Opaxe, SNL, with Ords Estimates, ranked by intercept length

Appendix 2: Porphyry 101

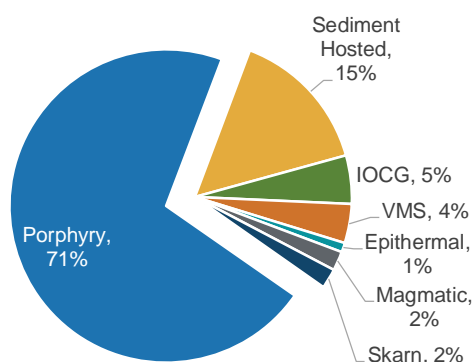
Porphyries are critical source of the world's supply of copper (among others) and contain 71% of the world's undeveloped copper resources. Deposits are normally characterised with very large volumes of ore at relatively lower grades. Due to the size and lower grade, extraction has historically relied on large scale open cut mining operations. However, the development of Block Caving techniques has enabled large underground deposits to be mined economically.

Importance of Porphyries: World's best mines

Porphyry deposits are the primary source of the world's molybdenum (95%), copper (65%), gold (10%) as well as several key industrial minerals (silver, tin, zinc etc). The deposits are often highly valuable commercially as they are large, long life and low cost and 'Company making' also known as 'Tier 1'. Whilst the term is often misused, we note that several of the world's most profitable 'Tier 1' deposits are porphyries. Local examples include Cadia. Minex Consulting defines Tier 1 deposits ([here](#)) as :

- Producing >5% of annual world production of a set commodity
- Capable of sustaining a mine life of >20 years and has multiple opportunities for expansion
- Is in the bottom quartile of its respective commodity cost curve
- Has robust economics that will generate cash flow irrespective of the business cycle.
- Generate returns of >5% above a company's cost of capital (including country risk premium)

Figure 31: World Copper Resources by Deposit Type



Source: Dobe & Twomey 2014

What is a 'Porphyry'?

- **Porphyry** is derived from 'Porphyritic' which is a texture description for rocks that contain a specific mineral pattern of large crystals being contained within a finer grained matrix. Not all 'porphyritic' rocks are from a porphyry. See below Figure 33: 'Porphyritic' Rock Sample.
- A **porphyry deposit** is generally composed of 'plug-like' igneous intrusion, from a large magma body that is emplaced beneath a volcanic system. They typically have a large mass of mineralized rock containing low grades of copper, gold and molybdenum. Common minerals include chalcocite, chalcocite and bornite.

Porphyries contain 71% of world undeveloped copper sources

Porphyries contain 95% of world's molybdenum, 65% of world's copper & 10% of world gold.

Tier 1 deposits:

-producing 5% of world production

-long life >20years

-bottom quartile of respective commodity cost curve

Porphyry is a large igneous rock with large, grained crystals (quartz/feldspar)

Figure 32: Porphyry Rock Sample



Source: [Geology for Investors](#)

Figure 33: 'Porphyritic' Rock Sample



Source: [911 Metallurgist](#)

History

The term porphyry is derived from the Greek word 'porphyra' for 'Purple' which in ancient times was the colour of royalty. Certain igneous rocks containing crystals of a deep purple were highly sought for building statues, monuments and special projects. In Imperial Rome, porphyry rock came from a single mine in Egypt, the Mons Porphyrites. Examples of this can be found to this day.

Figure 34: Examples of Roman Porphyry Use



Source: [Ex Urbe History 'Emperor Constantine'](#)

Copper porphyries were the first metallic deposits to be mined in open pits, starting in 1905 with the Bingham Canyon mine in Utah. Since 1970 over 95% of US copper production has come from porphyry deposits.

The Guggenheims: Wealth Built on Porphyry's

The Guggenheim family owes most of its fortune from mining investments in 'American Smelting and Refining Company' and 'Kennecott Copper'. At the turn of the 20th century these entities had control of three of the then largest copper mines including Bingham Canyon (Utah) and in Chile 'El Teniente' and 'Chuquibambilla'. At the end of World War 1, the Guggenheims controlled '75% of the world's copper, silver and lead production' ([here](#)).

Comes from greek work 'porphyra' meaning 'purple'

Mined by the Romans in Egypt

Porphyry's were the first open pits to be mined in Utah 1905

Guggenheims made their fortunes off 3 major Porphyry's (75% of world Cu, Ag, Pb supply)

How are they formed?

- A porphyry deposit is formed when tectonic plates converge and oceanic crust has subducted beneath continental crust (Figure 35)
- As tectonic plates subduct, the overlying upper mantle partially melts, and the liquid magma rises to the surface. As the molten magma cools, the dissolved metals begin to separate into distinct zones, resulting in a large area of mineralisation. (Figure 36)
- Porphyries are distinguished from other deposits by their large size and structural controls. In economic deposits these structures can result in a variety of mineralisation styles, including veins, vein sets, stockworks, fractures, 'crackled zones', and breccia pipes.

Figure 35: How Are Porphyries formed

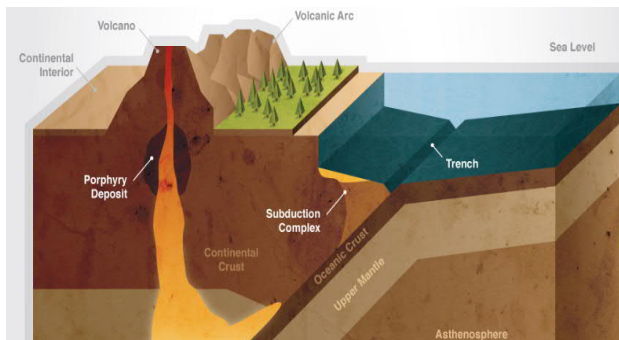
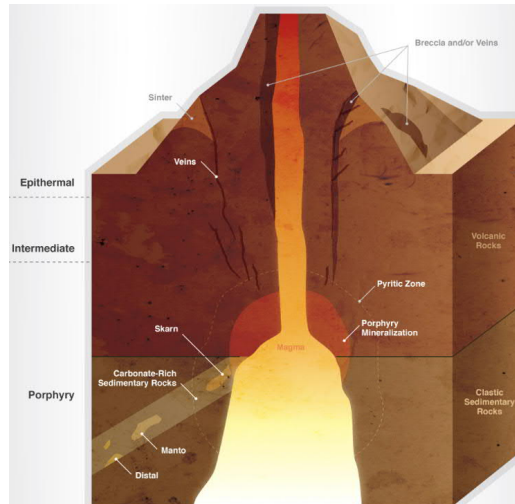


Figure 36: Typical Porphyry Cross Section



Source: [Visual Capitalist](#) with Ords Edits

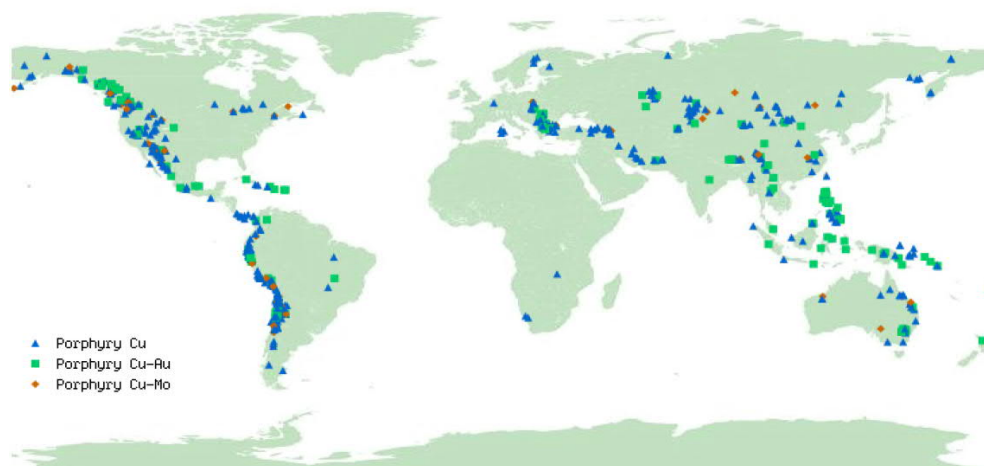
Where do they occur?

Porphyry deposits occur throughout the world in a series of extensive, relatively narrow, linear provinces. Most porphyry copper deposits occur close to subduction zones around the Pacific Rim.

The largest porphyry discovered was arguably Escondida (BHP.ASX/RIO.ASX) which was found in the Atacama Desert of Chile in the 1980s. At 2019 it contained 19,940mt at 0.49% copper.

Grasberg (FCX.NYS) is the world's largest gold mine as well as the third largest copper mine, with reserves of 2,800mt at 2.45g/t AuEq (1.1% copper, 1.04g/t gold)

Figure 37: Global distribution of porphyry deposits



Source: USGS

Porphyry's often contain several deposits spread over a large area

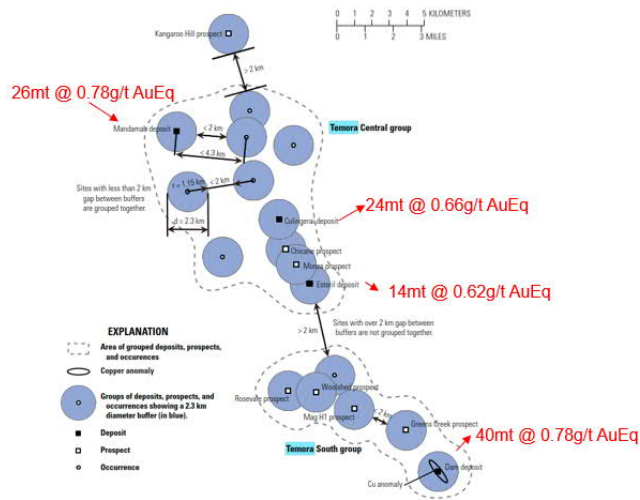
Deposits are grouped within 2km

Temora in NSW hosts several deposits

Deposit Clustering & '2km rule'

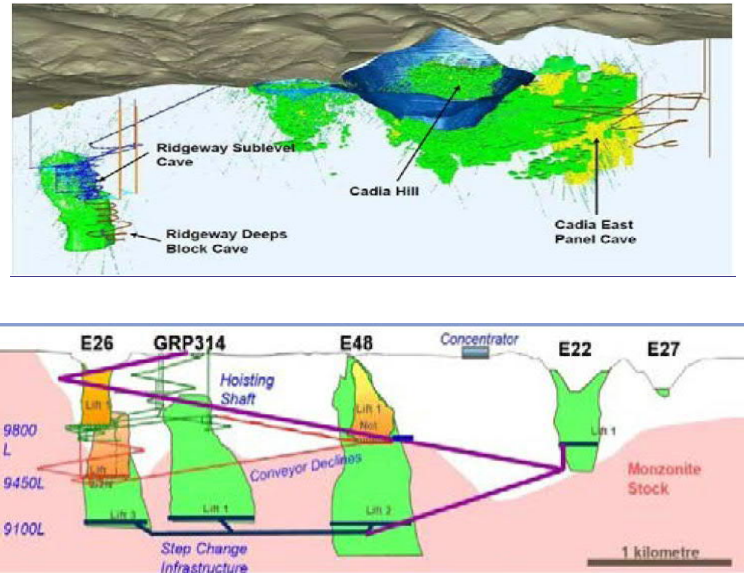
In large, complex, porphyry systems mineralisation typically has a very high deposit density. Deposits tend to occur as structurally controlled clusters and are typically grouped under a 2-km rule of grouping porphyry copper ore zones or deposits. A key visual example is the Temora Porphyry in NSW, which has 18 deposits grouped, of which six have a mineral resource containing a total of 239mt @ 0.64g/t AuEq using a 0.4g/t AuEq cut-off.

Figure 38: 2km rule -Temora Porphyry copper deposits



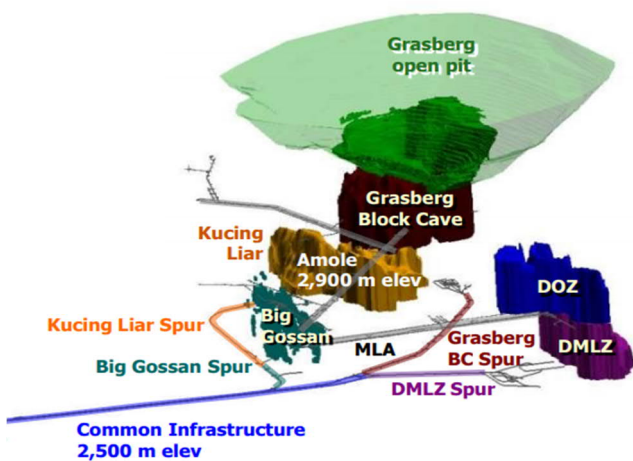
Source: USGS, Geoscience Australia, Company Presentations

Figure 39: Cadia (Top) & Northparkes (Bottom) Primary Orebodies



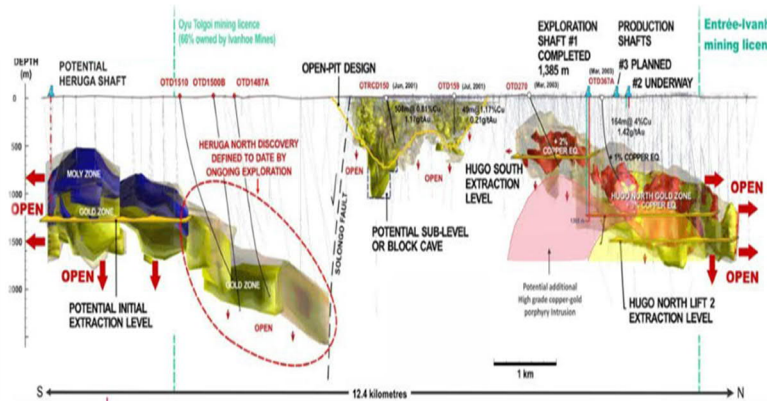
Source: Anatomy of Alkalic Porphyry Cu-Au system: Northparkes, 2019, Company Presentations

Figure 40: Grasberg Primary Orebodies



Source: Company Presentation

Figure 41: Oyu Tolgoi Primary Orebodies



Source: Company Presentation

Large number of orebodies within districts

We believe that investors need to think of Porphyries in terms of large districts rather than single deposit, According to a USGS study in 2005 (here) porphyry camps may have several other nearby deposits. We highlight the following points from our database analysis:

- At least two other deposit: 427 (or 62%) of camps indicate at least two additional deposit as being <10km away:

- 283 (33%) are other Porphyries (Cu, Au, Mo)
 - 178 (21%) are Skarns (Cu, Au, Base Metals)
 - Vein (20%) and Epithermal (15%).
- **Most within 5km:** 63% of deposits are within 5km of the primary camp, these appear to be smaller Skarns or Epithermal deposits compared to the primary camp.
 - **Other Large Porphyries nearby:** within 5-10km there appears to be a trend indicating other large Porphyry deposits (tend to be Cu only, Cu-Au or Cu-Mo). This aligns with several large camps contained in the case studies below for Oyu Tolgoi, Cadia Valley, North Parks.

Figure 42: Nearby Porphyry Deposits by Type

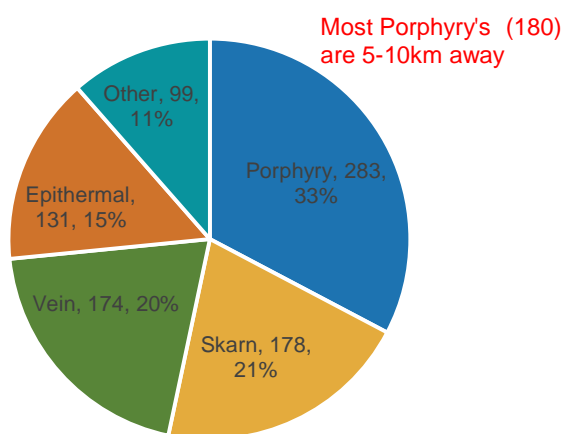
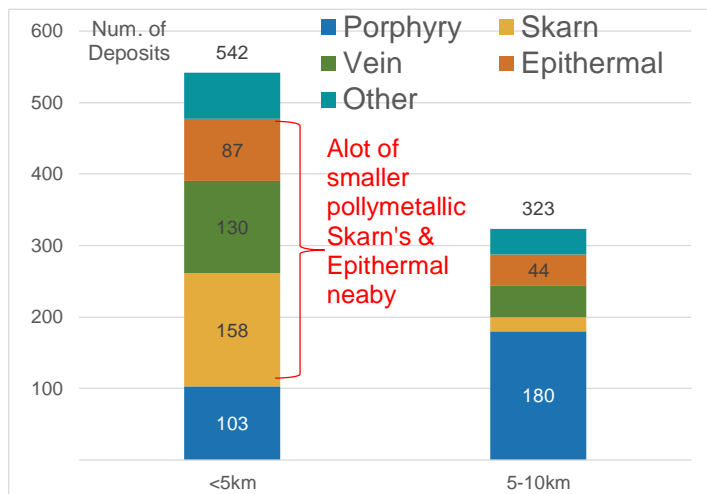


Figure 43: Nearby deposits by type and distance from primary camp



Source: USGS 2005 with Ords Edits, Other Deposits include Placer (28), Replacement (36), Sedimentary, Exotic Cu, (n=865)

Large Bulk Tonnage Low/Medium Grade,

There are 844 porphyries documented in the USGS database:

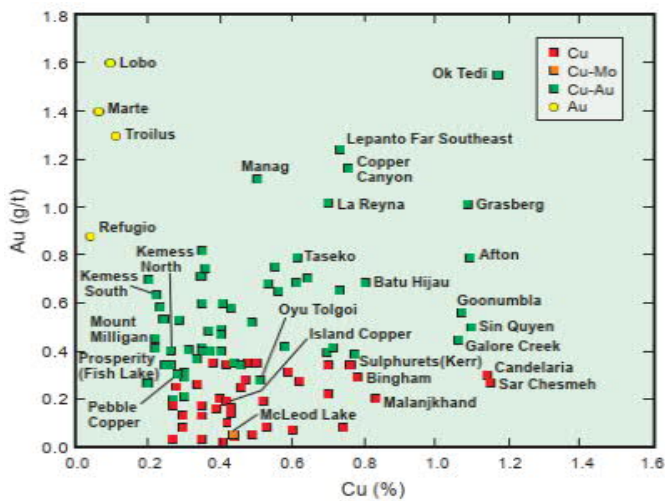
- **Worlds average:** of 884 deposits the mean resource is 750mt at 0.6g/t AuEq containing 15Moz AuEq (0.44% copper, 0.05g/t gold (range 0-1.3g/t) and 0.0023% Moly).
- **Top Decile:** mean resource is 2,200mt at 1.3g/t AuEq containing ~100Moz AuEq (0.8% copper, 0.25g/t gold and 0.05% Moly) .
- **Comparable projects:** there are 81 copper/gold only porphyry's containing <1,000mt. The mean size is 424mt at 1.02g/t AuEq containing 14Moz AuEq (0.47% Copper, 0.39g/t Au).

Figure 44: Porphyry Camp Analysis

	Primary No.	Other* No.	Ore mt	Gold g/t	Copper %	AuEq g/t	Gold Eq Moz	Length metres	Width metres	Height metres	Depth metres
USGS Data Base											
World Average	884	865	750	0.05	0.45	0.62	15	2,000	1,500	800	0 - 3600
Top 10%	84	252	2,225	0.25	0.80	1.33	95	1,760	760	1,230	200-1800
Cu-Au Only (<1Bt)	81		424	0.39	0.47	1.02	14				

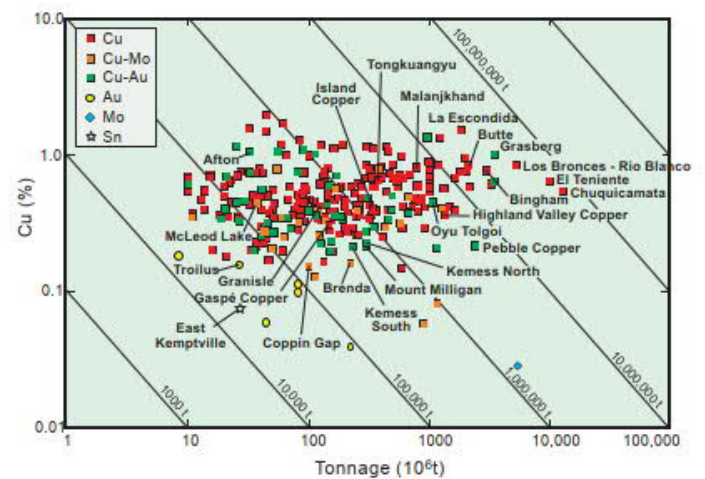
Source: USGS 2008, Sinclair 2007. *Other is number of deposits <10km away.

Figure 45: Gold vs Copper Grades of world deposits



Source: Sinclair 2007, Kirkham and Sinclair 1995

Figure 46: Copper grades vs tonnage of Porphyry Models



Source: Sinclair 2007, Kirkham and Sinclair 1995. Diagonal lines indicate tonnes of contained Cu. (Y Axis Log Scale)

Surface Mineralisation several deposits host low grade mineralisation close to at low strip ratios of <3:1 (waste: ore). Surface mines appear to have generated significant cash flow over prolonged periods. Projects often transition to higher grade deposits at depth using similar scales to the openpit using block caving mining techniques.

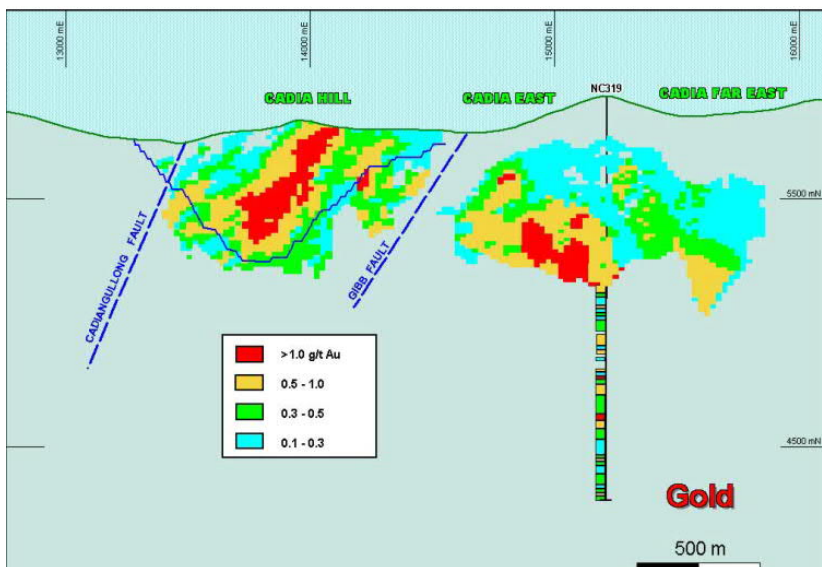
Appendix 3: Case Study - Cadia Operations

Newcrest's Cadia Valley Operations (CVO) are about 25km south-southwest of the town of Orange in central-eastern New South Wales (NSW) and about 190km west of Sydney.

Cadia is considered a Tier 1 asset, due to its large production of 1Moz AuEq annually (~700koz gold, ~75ktpa of copper) and its extremely low cost of US\$190/oz (AISC). Over the past five years the business has generated ~US\$3.6bn in free cash flow.

The major mineralisation known to date in the Cadia Valley occurs in three main porphyry related deposits: Cadia Hill, Ridgeway and Cadia East.

Figure 47: Section through Cadia Hill and Cadia East gold block model



Source: Tedder, Holliday and Hayward, 2001

Timeline

- **1960's:** Modern era mining started in Cadia Valley
- **1990:** Newmont & BHP gold corporation (owner of Cadia) merge to create Newcrest.
- **1992:** 'Cadia Hill' deposit discovered:
 - NC35 150m @ 0.55g/t Au from surface
 - NC36 147m @ 1.1g/t AuEq from 13m
- **1992-1993:** 1 drill rig 2 crews drilling for holes NC37-48.
 - **Jan 1993** – best hit NC40 243m @ 1.4g/t AuEq
- **1994:**
 - **Jan 1994** - Completed 23km drilling over 64 holes giving 150m x 100m cover.
 - **Feb 1994:** 'Hill' maiden Inferred resource of 97mt at 1.34g/t containing 3.4Moz (46 holes)
 - Cadia East surface mineralisation found: 200m east, 176m @ 1.2g/t AuEq
 - Nov 1994: Inferred resource update 148mt @ 1.19g/t AuEq
- **1995:**
 - Step out drilling 200m and 400m along strike length of 1650m.
 - March: 'Hill' Inferred surface resource 232mt @ 1.08g/t AuEq (199 holes)
- **1996:** Cadia Hill DFS and Ridgeway Discovery

25km south-southwest of orange.

Tier 1 Asset

1Moz AuEq production (700koz Au, 75ktpa Cu)

Last 5 years A\$5B in free cash flow

1992: Cadia hill deposit discovered

1994: Discovers Cadia East

1996: Cadia Hill DFS & Ridgeway Discovered

-A\$441m capex

-17mtpa

-Reserve: 205mt @ 0.95 g/t AuEq

- 'Cadia Hill' DFS completed: A\$441m capex, opex of A\$7/t (1995 dollars), 17mtpa, low strip ratio (2.4:1) Reserve 205mt @ 0.95g/t AuEq
- Nov 1996 Ridgeway discovered: hole NC498 hits 145m @ 5.84gt from 598m (4.3g/t Au 1.2% Cu)
- **2001:** Cadia East Underground maiden inferred 63mt.
- **2005:** Cadia East Underground: Pre-Feasibility Study defines 165mt 1.59g/t AuEq. Spend \$100m on Definitive Pre-Feasibility including a 6.7km exploration decline
- **2007:** Cadia East Surface Feasibility, 143mt @ 0.97g/t AuEq.
- **2009:** Cadia East underground DFS approved: A\$1.9bn for panel cave and expand mill capacity to 26mtpa.
- **2010:** Cadia East Surface DFS scrapped as uneconomic and focused on underground. Reserve 1,073mt @ 1.01g/t AuEq diluted – utilising panel caving.
- **2012:** 1st production from Cadia panel (block) cave.

2005: Cadia East underground PFS -165mt @ 1.59g/t AuEq

2007: Cadia East surface feasibility: 143mt @ 0.97g/t AuEq

2009: Cadia East underground DFS approved -A\$1.9B panel cave -26mtpa

Figure 48: Cadia Development history

Project	Cadia
Owner	Newcrest
Timeline	<p>1992/1993: 'Cadia Hill' discovery, hole NC36 147m @ 1.1g/t AuEq</p> <p>1994: Discovers Cadia East – 176m</p> <p>1996: Discovers Ridgeway 145m @ 5.8g/t AuEq</p> <p>1996: 'Cadia Hill' DFS approved 17mtpa OC A\$441m, low strip.</p> <p>1998: Cadia Hill 1st production</p> <p>2001: Cadia East UG maiden resource 63mt @ 2.3 g/t AuEq</p> <p>2005: PFS UG 143mt @ 1.6g/t AuEq, \$100m for DFS decline</p> <p>2006: Resources for Cadia East (UG+OC) exceed 1billion tonnes</p> <p>2009: DFS approves A\$1.9bn 26mtpa block cave</p> <p>2012: 1st production block cave</p>
Reserve/Resource & Mine Life	<p>Resource: 3,170mt @ 0.7g/t AuEq (>100yrs)</p> <p>Reserve: 1,480mt @ 0.82g/t AuEq (20yrs)</p>
Deposits discovered/mined	<p>7/4, Au-Cu Porph (5): Ridgeway, Hill, Quarry, East, Far East</p> <p>Skarns (2): Iron Duke, Little Cadia</p>

Source: Company Filings, USGS 2010

2010: Cadia East surface DFS scrapped as uneconomic

Current Resource: 3,170mt @ 0.7g/t AuEq (>100yrs mine life)

Current Reserve: 1,480mt @ 0.82g/t AuEq (20yrs mine life)

Appendix 4: Case Study - Northparkes

China Molybdenum's/Sumitomo groups North Parkes is located 27km north of Parkes in central NSW and was the 1st mine in Australia to utilise the block caving underground mining technique in 1997. It has been operating for >25 years producing copper concentrate containing gold by-product credits.

Northparkes currently produces 180koz AuEq annually (mostly copper 40kt and 31koz gold). Over the past 5 years the project has generated US\$100m of Ebitda annually at a low C1 cash cost of US\$0.80/lb. The Northparkes area is known to contain 15 deposits of which 5 have been mined.

Timeline

In the Northparkes area, copper showings in weathered outcrops of andesitic volcanic rocks have been known since the late 19th century, but porphyry copper exploration did not begin until 1964.

- **1972-1976:** explored Goonumbla Volcanic Complex assessing the potential for VHMS hosted Pb–Zn deposits in the submarine volcanics:
- **1972:** Regional mapping and rock geochemical sampling discovered outcropping lead-zinc skarn mineralisation in 1973 at the Endeavour 7 prospect.
- **1974-1975:** An aeromagnetic survey was flown followed by mapping and sampling of outcropping areas.
- **1975-1976:** AC drilling focused on VHMS style deposits; however, the identification of skarns had demonstrated the importance of intrusive related mineralisation.
- **1976:** AC drilling 1 km centres intersected the eastern margin of the Endeavour 22 (E-22) porphyry Cu-Au deposit 229m @ 1.45 g/t AuEq. This led to the discovery of three other Endeavour deposits (E-26, E-27, and E-48).
- **1977-1998:** follow-up RAB drilling defined a large Cu-Au anomaly intercepted 229m 1.45g/t AuEq from 65 metres. E27 discovery in 1978. finds 6x porphyry systems E-27, R28, E20, E22 North, E28 North, E31 North, E3.
- **1992:** Board approves \$255m construction new 5mtpa mine
- **1997:** 1st panel cave starts production
- **1999-2004:** 4x new porphyry systems (Veedas, Hopetoun, Brazen, GRP 314) within 6 km from existing infrastructure.
 - Three additional porphyry Cu-Au deposits (E-28, E-31N, and E-37) also have been discovered.
 - 2000: Rio Tinto Acquires Northparkes
- **2013:** Rio Tinto sells 80% stake to China Moly (CMOC) for US\$820m
- **2015:** World first automated block cave.
- **2020:** CMOC Sells US\$550m Gold & Silver stream royalty to Triple Flag.

Owned by China Molybdenum & Sumitomo group

1st mine to utilise block caving in Australia (1997)

Currently producing 180koz AuEq pa

Past 5 years generated US\$100m of EBITDA pa at low C1 cash cost of US\$0.80/lb

1976: Discovery of Endeavor 22 229m @ 1.45g/t AuEq + 3 other deposit discoveries E-26, E-27 & E-28)

1992: Board approves \$255m 5mtpa mine.

1997: 1st panel cave starts production

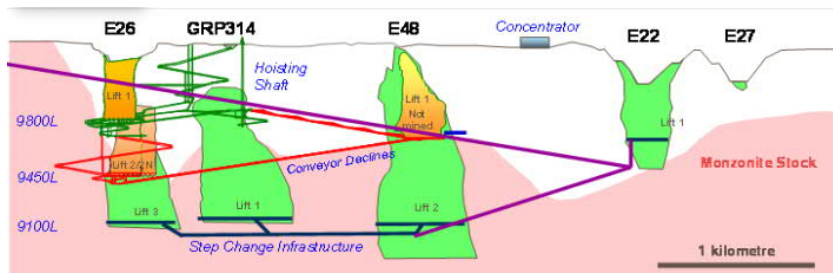
2000: Rio Acquire Northparkes

2013 Rio Tinto sells 80% stake to CMOC for US\$820m

2015: World's 1st automated block cave

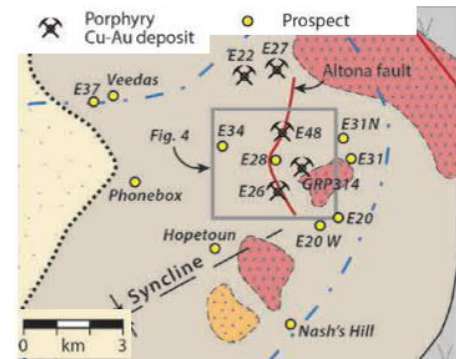
2020: CMOC sell US\$550m royalty to Triple Flag

Figure 49: Northparkes simplified Cross section



Source: Rio Tinto 2010

Figure 50: Regional Deposit Layout



Source: Rio Tinto 2010

Figure 51: Northparkes Development history

Project	Northparkes
Owner	China Moly
Timeline	<p>1977: Discovers Endeavor (E-22) 229m @ 1.45g/t AuEq</p> <p>1978: Discovers 3x Cu-Au porphyries (E26, E27, E48)</p> <p>1979-1998: finds 6x more low-grade porphyries</p> <p>1992: DFS approves A\$255m mine 5.5mtpa, Reserve - 64mt @ 2.3g/t AuEq. 2x Opencut, 1x Block Cave (Aus. 1st)</p> <p>1994: 1st production, OC 1.5mtpa gold from 1.7mt @ 2g/t Au.</p> <p>1997: 1st block cave ore, ramps to 5.5mtpa</p> <p>1999-2004: 4x new Cu-Au porphyry systems (Inc. +1 Au) found <6km of infra</p> <p>2004-2014: 3 new porphyry Cu-Au deposits (28,31,37)</p> <p>2015: Worlds 1st fully automated block cave, expands to 6.5mt</p> <p>2019: Expands to 7.7mt by 2022</p> <p>2020: CMOC Sells US\$550m Gold & Silver stream royalty to Triple Flag.</p>
Reserve/Resource & Mine Life	<p>Resource: 483mt @ 0.84g/t AuEq (70 years)</p> <p>Reserve: 123mt @ 0.93g/t AuEq (18 years)</p>
Deposits discovered/mined	15/5

Source: Company Filings, USGS 2010

Current Resource:
483mt @ 0.84g/t AuEq
(70yrs mine life)

Current Reserve:
123mt @ 0.93g/t AuEq
(18yrs mine life)

Glossary

<i>Abbreviation</i>	<i>Meaning</i>
@	denotes the metal grade which accompanies an indication of material size, scale or width. Example: the deposit contained 200 million tonnes @ 2% copper.
AD	Auger drilling – method of drilling using rods with an outer spiral that draws the material being penetrated to the surface using a screw-like action.
AISC	All in sustaining cost - mining metric that estimates all direct and recurring costs required to mine a unit of ore.
Au	Chemical element abbreviation for Gold
AuEq	See 'Gold Equivalent'
BCI	BC Iron.
BFS	Bankable Feasibility Study - compiles results of other feasibility studies done when planning a mining project and adds information on required permits, environmental impact, negotiated contracts and the costs of closing the mine and reclaiming the ground.
Block cave	An inexpensive method of mining in which large blocks of ore are undercut, causing the ore to break or cave.
C1 Cost	Reference point to imply the basic cash costs of running a mining operation to allow a comparison across the industry.
CAI	Calidus Resources Limited.
Camp	A colony of miners settled temporarily near a mine or a goldfield.
Capex	Capital Expenditure
CIC	Carbon-In-Column.
CIL Plant	Carbon-in-leach - a process for recovering gold from rock where the gold is dissolved by cyanide in the same tank as it is absorbed onto carbon.
CMOC	China Molybdenum Co., Ltd. (3993.HK).
Copper equivalent	or 'CuEq' percentage of marketable metals contained in mineralized material, determined by converting all other metals other than copper to equivalent copper on the basis of a market price. Ords assumes 1 tonne of ore containing 1% Copper equates to ~US\$70/t. Formula is $CuEq (\%) = \text{copper grade } \% + (\text{Gold grade } \div 31.1035 \times \text{Gold price } (\$/\text{oz}) \div \text{Copper price } (\$/\text{t})$
CRA	Conzinc Rio Tinto of Australia.
Cu	Chemical element abbreviation for copper
Cu-Au	Gold and copper
CuEq	See Copper Equivalent
DDH	Diamond Drill hole - The hole from a method of obtaining a cylindrical core of rock by drilling with a diamond set or diamond impregnated bit.
DFS	Definitive feasibility study - The most detailed form of feasibility study which determines definitively whether to proceed with a mining project.
District	A section of country usually designated by name, having described, or understood boundaries within which minerals are found and worked.
Deposit	A mineralised ore body which has been physically delineated by sufficient drilling, trenching, and found to contain a sufficient average grade of metal/s to warrant further exploration and/or development expenditures.
EIS	Exploration Incentive Scheme - A State Government initiative that aims to encourage exploration in Western Australia for the long-term sustainability of the State's resources sector.

Epithermal	A process of ore formation in and along openings in rocks at shallow depths from ascending hot solutions.
Epithermal Deposit	A mineral deposit consisting of veins and replacement bodies, usually in volcanic or sedimentary rocks, containing precious metals or, more rarely, base metals.
FID	Final Investment Decision – taken by company board to proceed to develop a project, typically at the final stage of feasibility study.
g/t	Grams per tonne
GMD	Genesis Minerals Limited
Gold Equivalent	Or AuEq means a quantity of a Metal having an economic value expressed in ounces of Gold and calculated by multiplying the quantity of the Metal by an assumed price for that Metal and dividing the product by an assumed price for Gold. Expressed as grams per tonne, or ounces of gold. 1 gram per tonne at time of writing equates to US\$50. Our estimates assume a US\$1,600/oz gold price and US\$6,000/t copper price.
Grade	The amount of valuable mineral in a rock or alluvial sample, usually expressed as a percentage, parts per million (ppm) or in grams per tonne (g/t)
IOCG	Iron oxide copper gold ore deposits - highly valuable concentrations of copper, gold and uranium ores hosted within iron oxide dominant gangue assemblages which share a common genetic origin.
IP anomaly	Induced Polarisation Anomaly – a significant mineral finds using a geophysical imaging technique in mineral exploration
JORC-code-compliant	(Joint Ore Reserves Committee Code) - a professional code of practice that sets minimum standards for public reporting of minerals exploration results, mineral resources, and ore reserves.
Km	Kilometre
Koz	Thousand ounces
kt	Thousands of tonnes
LOM	Life of mine - Number of years that an operation is scheduled to mine and treat ore and is based on the current mine plan.
Strip ratio	The tonnage of waste rock to be mined, divided by the tonnage of ore to be mined from the pit.
Mineralisation	The process by which minerals are introduced to a rock. More generally a term applied to accumulations of economic or related minerals in quantities ranging from anomalous to economically recoverable.
Mo	Molybdenum - A chemical element contained in various minerals.
Moz	Million ounces.
Mt	Million tonnes.
mtpa	Million tonnes per annum.
OC	Opencut.
Ounces	or 'Troy ounces' is a unit of measure typically for precious metals. 1 ounce contains 31.103 grams
Oz	Ounces.
Panel Cave	A mining block that generally comprises one operating unit.
Pb-Zn	Lead-Zinc.
PD	Palladium - a shiny white metal in the same group as platinum.
PFS	Prefeasibility Study - A comprehensive analysis which is qualified by the availability and accuracy of fundamental criteria and assumptions to the degree that it cannot be the basis for final decisions.

Porphyry	See Appendix 4: Porphyry 101' Page 26.
ppm	Parts per million - grade indication, same as grams per tonne.
RAB Drilling	Rotary-air blast Drilling - A drilling process using a rotating drill bit to cut the rock and compressed air to recover the cuttings.
RC	Reverse Circulation - A percussion drilling technique.
ROM	Run-of-mine.
Skarn	The metamorphic rocks surrounding an igneous intrusive where the latter has encountered limestone or dolomite rocks.
SS	Scoping study - preliminary study to define a possible metallurgical circuit of a project.
TGO	Tomingley Gold Operations.
TGP	Tomingley Gold Project.
TMM	The use of any self-propelled mobile machine for the purpose of performing mining, transport, or associated operations underground or on surface at a mine.
UG	Underground.
Vein	A mineralised zone having a regular development in length, width and depth which clearly separates it from neighbouring rock.
VHMS	Volcanic-Hosted Massive Sulphide - stratiform accumulations of sulphide minerals that precipitate from hydrothermal fluids on or below the seafloor in a wide range of ancient and modern geological settings.
Cut Off	The estimated lowest grade of ore that can be mined and treated profitably.

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Alkane Resources

PROFIT & LOSS (A\$m)	2019A	2020A	2021E	2022E	2023E
Revenue	94.0	72.5	122.4	118.0	130.0
Operating costs	(6.4)	(8.9)	(66.3)	(52.1)	(53.3)
Operating EBITDA	32.2	28.6	56.1	65.9	76.7
D&A	(7.3)	(9.1)	(9.9)	(9.0)	(9.5)
Non-operating items	(14.5)	0.4	(1.5)	(1.5)	(1.5)
EBIT	25.0	19.9	44.7	55.4	65.7
Net interest	(0.3)	0.5	(0.2)	(0.3)	(0.2)
Pre-tax profit	25.4	19.9	44.5	55.1	65.5
Net tax (expense) / benefit	(2.3)	(6.6)	(13.4)	(16.5)	(19.7)
Significant items/Adj.	(0.3)	3.7	-	-	-
Associate NPAT	-	-	-	-	-
Normalised NPAT	22.8	16.5	31.2	38.5	45.9
Reported NPAT	23.1	12.8	31.2	38.5	45.9
Normalised dil. EPS (cps)	4.4	2.9	5.2	6.4	7.7
Reported EPS (cps)	4.5	2.3	5.2	6.4	7.7
Effective tax rate (%)	9.2	33.0	30.0	30.0	30.0
DPS (cps)	-	-	-	-	-
DPS (cps)	-	-	-	-	-
Dividend yield (%)	-	-	-	-	-
Payout ratio (%)	-	-	-	-	-
Diluted # of shares (m)	519.4	564.2	598.6	598.6	598.6

CASH FLOW (A\$m)	2019A	2020A	2021E	2022E	2023E
EBITDA incl. adjustments	39.9	41.5	54.9	65.9	76.7
Change in working capital	(5.3)	(2.8)	1.4	-	(0.0)
Net Interest (paid)/received	(0.1)	0.9	(0.2)	(0.3)	(0.2)
Income tax paid	-	-	-	(6.5)	(16.5)
Other operating items	1.9	(11.0)	-	-	-
Operating Cash Flow	36.4	28.5	56.1	59.1	60.0
Capex	(31.2)	(66.3)	(61.0)	(32.7)	(49.2)
Acquisitions	-	-	-	-	-
Other investing items	(7.4)	(11.0)	(29.7)	-	-
Investing Cash Flow	(38.6)	(77.3)	(90.7)	(32.7)	(49.2)
Inc/(Dec) in equity	-	40.7	-	-	-
Inc/(Dec) in borrowings	-	6.6	2.9	-	-
Dividends paid	-	-	-	-	-
Other financing items	-	(1.2)	-	-	-
Financing Cash Flow	-	46.1	2.9	-	-
FX adjustment	-	-	-	-	-
Net Inc/(Dec) in Cash	(2.3)	(2.7)	(31.7)	26.4	10.8

BALANCE SHEET (A\$m)	2019A	2020A	2021E	2022E	2023E
Cash	69.5	66.9	35.2	61.5	72.3
Receivables	2.0	2.9	3.4	3.5	3.9
Inventory	4.8	7.6	8.6	8.8	9.7
Other current assets	0.2	0.2	-	-	-
PP & E	51.0	62.3	94.5	103.2	127.9
Intangibles	-	-	-	-	-
Other non-current assets	89.8	11.0	115.4	123.8	139.8
Total Assets	248.7	206.7	257.0	300.9	353.7
Short term debt	-	2.1	2.1	2.1	2.1
Payables	8.0	9.4	11.8	10.4	10.7
Other current liabilities	-	0.1	-	-	-
Long term debt	-	4.5	5.8	5.8	5.8
Other non-current liabilities	-	0.1	16.7	24.4	32.1
Total Liabilities	34.8	52.3	71.4	76.8	83.7
Total Equity	213.9	154.4	185.6	224.1	270.0
Net debt (cash)	(69.5)	(60.3)	(27.3)	(53.6)	(64.4)

Buy

DIVISIONS	2019A	2020A	2021E	2022E	2023E
KEY METRICS (%)	2019A	2020A	2021E	2022E	2023E
Revenue growth	(27.7)	(22.8)	68.7	(3.6)	10.2
EBITDA growth	(53.6)	(11.3)	96.3	17.4	16.4
EBIT growth	(21.8)	(20.2)	124.3	23.8	18.7
Normalised EPS growth	(6.7)	(33.6)	78.4	23.7	19.0
EBITDA margin	34.3	39.4	45.8	55.8	59.0
OCF /EBITDA	107.3	135.3	100.4	100.0	100.0
EBIT margin	26.6	27.5	36.5	46.9	50.5
Return on assets	9.4	5.9	12.5	13.9	14.0
Return on equity	11.3	8.9	17.5	18.8	18.6

VALUATION RATIOS (x)	2019A	2020A	2021E	2022E	2023E
Reported P/E	18.1	35.6	15.5	12.5	10.5
Normalised P/E	18.3	27.6	15.5	12.5	10.5
Price To Free Cash Flow	-	-	-	0.2	0.4
Price To NTA	1.9	2.9	2.6	2.1	1.8
EV / EBITDA	10.0	12.2	7.1	5.5	4.3
EV / EBIT	12.9	17.4	9.0	6.5	5.1

LEVERAGE	2019A	2020A	2021E	2022E	2023E
ND / (ND + Equity) (%)	(48.1)	(64.0)	(17.2)	(31.5)	(31.3)
Net Debt / EBITDA (%)	(215.7)	(210.9)	(48.6)	(81.4)	(84.0)
EBIT Interest Cover (x)	76.4	-	237.2	191.6	417.9
EBITDA Interest Cover (x)	98.6	-	297.6	227.9	487.9

SUBSTANTIAL HOLDERS	m	%
Ian Gandel	147.4	24.8%
Van Eck	26.2	4.4%
Vanguard	15.7	2.6%

VALUATION	
Cost of Equity (%)	9.1
Cost of debt (after tax) (%)	4.2
WACC (%)	6.4

Target Price Method	NPV
Target Price (\$)	1.30
Valuation disc. / (prem.) to share price (%)	61.5

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Guide to Ord Minnett Recommendations

SPECULATIVE BUY	We expect the stock's total return (nominal yield plus capital appreciation) to exceed 20% over 12 months. The investment may have a strong capital appreciation but also has high degree of risk and there is a significant risk of capital loss.
BUY	The stock's total return (nominal dividend yield plus capital appreciation) is expected to exceed 15% over the next 12 months.
ACCUMULATE	We expect a total return of between 5% and 15%. Investors should consider adding to holdings or taking a position in the stock on share price weakness.
HOLD	We expect the stock to return between 0% and 5%, and believe the stock is fairly priced.
LIGHTEN	We expect the stock's return to be between 0% and negative 15%. Investors should consider decreasing their holdings.
SELL	We expect the total return to lose 15% or more.
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