

29 April 2019

## *Quarterly Activities Report to 31 March 2019*

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### *Tomingley Gold Operations*

- Development of the underground operation continues on budget and on schedule.
- Quarter Results
  - Gold production was above forecast at 10,669 ounces.
  - Site operating cash costs were A\$800/ounce with AISC of A\$956/ounce.
  - Gold sales were 10,791 ounces for revenue of A\$19.9M at an average price of A\$1,841/ounce.
- Guidance for FY19 has increased with production of 42,000 to 47,000 ounces of gold at an AISC of A\$950 to A\$1,100 per ounce.

### *Corporate*

- Cash, bullion and listed investments position totalled A\$78.8M
  - A\$72.4M in cash, bullion on hand at fair value of A\$1.8M, and \$4.6M of listed investments at market value.
- Continues to hold ~10.2% of ASX listed gold developer Calidus Resources Ltd (Calidus).
- Continuing to seek further investment opportunities.

### *Exploration*

- 45 RC drill holes for a total of 9,843 metres testing the gold resource potential of the Roswell and San Antonio targets were completed. Significant broad high grade gold intersections were recorded at both prospects over a strike length of 1.5 kilometres and highlight the potential for this discovery to extend the mine life at TGO, subject to successful approvals.
- A substantial resource drill out program is planned to commence as soon as practical.

### *Dubbo Project*

- Offtake discussions continue to be held with third parties, with commitment dependent on customers, particularly their view of supply risk from within China.

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## **TOMINGLEY GOLD OPERATIONS**

*Tomingley Gold Operations Pty Ltd 100%*

Tomingley Gold Operations (TGO) is a wholly owned subsidiary of Alkane, located near the village of Tomingley, approximately 50km southwest of Dubbo in Central Western New South Wales. The gold processing plant was commissioned in January 2014 and has been operating at the design capacity of 1Mtpa since late May 2014. Mining is based on four gold deposits (Wyoming One, Wyoming Three, Caloma One and Caloma Two).

### ***Operations***

TGO continues to perform very well. Open pit mining finished during the quarter. Underground development from the base of the Wyoming One pit continues and is both on schedule and on budget. TGO continued to process its medium grade stockpiles through the quarter, and will process the low grade stockpile for the remainder of the year before processing the underground ore.

A total of 10,669 ounces of gold were poured for the quarter. The site cash costs for the quarter were A\$800/oz with an all-in sustaining cost (AISC) of A\$956/oz.

Guidance for FY19 has increased with production of 42,000 to 47,000 ounces of gold at an AISC of A\$950 to A\$1,100 per ounce. Guidance has further increased due to the continued higher than expected grade of some stockpiles.

Gold sold for the quarter was 10,791 ounces at an average sales price of A\$1,841/oz, generating revenue of A\$19.9M. Bullion decreased to 952 ounces (fair value of A\$1.8M at quarter end). Run of mine ore stockpiles were used through the period as ore from the open pits ramped down.

Site operating cash flow<sup>1</sup> was A\$9.0M for the quarter.

### ***Underground Mining Development***

Underground development has continued on schedule with both the main decline and vent portals progressing. All required personnel and equipment are on site, further equipment is arriving on schedule. The development remains on budget.

### ***Regional Exploration***

An extensive exploration program focused on the immediate area to the south of the TGO mine has continued as part of the plan to source additional ore feed, either at surface or underground, in the future for TGO. The exploration target area has a cumulative strike length of 2,500 metres comprising the Roswell, San Antonio and El Paso prospects (**ASX Announcement 19 October 2018**).

Exploration for the quarter consisted of 45 RC drill holes for a total of 9,843 metres and one core hole testing the gold resource potential of the Roswell and San Antonio prospects.

<sup>1</sup>**Operating cashflow** = As prescribed by AASB 107 Statement of Cashflows where exploration outflows and development outflows are grouped under investing cashflows. Note that the Quarterly Cashflow (Appendix 5B) includes those outflows under operating cashflows. Tomingley underground development expenditure was included under investing cashflows in Appendix 5B as production from underground has not commenced.



## TGO FY 2019 Quarterly and Annual Production Figures

TGO Production		FY 2018	Sep Quarter 2018	Dec Quarter 2018	Mar Quarter 2019	FY 2019
Waste mined	BCM	3,165,414	234,281	336,812	86,555	657,647
Ore mined	Tonnes	1,589,811	258,108	103,488	29,745	391,340
Strip Ratio	Ratio	5.4	2.5	8.8	5.6	4.5
Grade	g/t	1.99	1.79	1.67	0.99	1.70
Ore milled	Tonnes	1,092,602	240,797	239,687	245,216	725,700
Head grade	g/t	2.42	2.29	1.62	1.57	1.82
Recovery	%	91.9	92.4	93.1	91.7	92.4
Gold poured	Ounces	78,533	15,634	11,111	10,669	37,414
<b>Revenue Summary</b>						
Gold sold	Ounces	75,507	6,656	23,841	10,791	41,288
Average price realised	A\$/oz	1,706	1,720	1,716	1,841	1,749
Gold revenue	A\$M	128.8	11.4	40.9	19.9	72.2
<b>Cost Summary</b>						
Mining	A\$/oz	475	384	338	176	311
Processing	A\$/oz	236	309	410	464	383
Site Support	A\$/oz	56	70	98	160	104
C1 Site Cash Cost	A\$/oz	767	763	846	800	798
Royalties	A\$/oz	52	50	47	50	49
Sustaining capital	A\$/oz	32	23	72	11	34
Rehabilitation	A\$/oz	117	101	24	35	59
Corporate	A\$/oz	34	36	61	60	50
AISC <sup>2</sup>	A\$/oz	1,002	972	1,051	956	991
Bullion on hand	Ounces	4,836	13,811	1,077	952	952
<b>Stockpiles</b>						
Ore for immediate milling	Tonnes	1,256,823	1,266,911	1,132,562	915,085	915,085
Grade	g/t	0.97	0.89	0.83	0.75	0.75
Contained gold	Ounces	39,338	36,355	29,992	22,077	22,077

<sup>2</sup>AISC = All in Sustaining Cost comprises all site operating costs, royalties, mine exploration, sustaining capex, mine development and an allocation of corporate costs, calculated on the basis of ounces produced. AISC does not include share based payments or net realisable value provision for ore inventory.

At **Roswell** assay results were received from 19 reverse circulation (RC) drill holes completed at the prospect, 3km from TGO, for a total of 4,266 metres. The mineralisation was intersected over a strike length of approximately 350 metres and remains open to the north and south. The highest grading mineralisation at Roswell was intersected by RWRC023 on the southernmost traverse completed to date.

Some holes terminated in mineralisation due to the drill rig capacity and/or intersecting moderate water flows. Details were provided in **ASX announcement 31 January 2019** with significant results of:

**RWRC020** 12 metres grading 1.52g/t Au from 216 metres;  
 incl 3 metres grading 3.24g/t Au from 219 metres;  
 and 9 metres grading 1.18g/t Au from 243 metres;  
 and 3 metres grading 1.23g/t Au from 273 metres;  
 and 18 metres grading 2.28g/t Au from 285 metres;  
 incl 3 metres grading 9.98g/t Au from 294 metres;

**RWRC023** 39 metres grading 4.49g/t Au from 123 metres;



incl 9 metres grading 8.43g/t Au from 123 metres;  
and 6 metres grading 4.70g/t Au from 189 metres;  
and 21 metres grading 2.46g/t Au from 207 metres;  
incl 8 metres grading 4.83g/t Au from 217 metres;  
and 26 metres grading 2.48g/t Au from 234 metres to end of hole;  
incl 3 metres grading 5.57g/t Au from 234 metres;  
also 3 metres grading 4.63g/t Au from 249 metres.

The RC drilling of 26 holes totalling 5,577 metres at **San Antonio** also returned a number of high grade intercepts recorded over an open strike length of over 800 metres. Details were provided in **ASX announcement 28 March 2019** with substantial results of:

RWRC030 8 metres grading 6.10g/t Au from 61 metres;  
incl 1 metre grading 32.90g/t Au from 64 metres;

RWRC036 12 metres grading 4.01g/t Au from 126 metres;  
incl 3 metres grading 11.55g/t Au from 129 metres;

RWRC038 24 metres grading 5.08g/t Au from 78 metres;  
incl 6 metres grading 13.83g/t Au from 78 metres;  
and 9 metres grading 1.08g/t Au from 132 metres;  
and 30 metres grading 1.30g/t Au from 156 metres;  
incl 3 metres grading 4.30g/t Au from 166 metres;

RWRC044 51 metres grading 2.52g/t Au from 39 metres;  
incl 18 metres grading 5.34g/t Au from 57 metres;  
and 9 metres grading 1.69g/t Au from 96 metres;

RWRC045 33 metres grading 4.37g/t Au from 141 metres;  
incl 9 metres grading 12.25g/t Au from 141 metres;

RWRC046 6 metres grading 3.69g/t Au from 63 metres;  
and 6 metres grading 5.06g/t Au from 75 metres;  
and 21 metres grading 1.24g/t Au from 120 metres;

RWRC047 39 metres grading 6.09g/t Au from 153 metres to end of hole;  
incl 9 metres grading 10.45g/t Au from 153 metres;  
also 6 metres grading 15.41g/t Au from 180 metres.

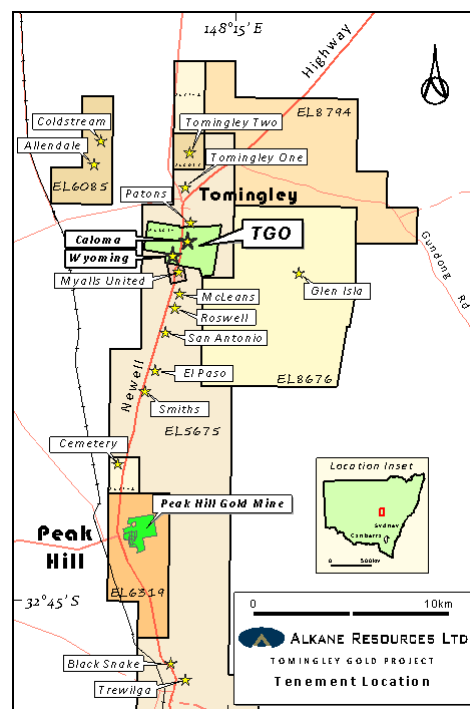
Additional RC drilling has been completed (11 holes for 2,498 metres) to infill the open zone between Roswell and San Antonio. At **El Paso** a 900 metre strike length of mineralisation was further tested by 10 RC holes (1,973 metres), while 5 RC holes (1,068 metres) of drilling was completed at the **McLeans South** target, immediately to the north of Roswell.

One core hole, RWD003 (358 metres), was drilled adjacent to broad high grade intercepts in RWRC023 for structural and lithological information. The hole intersected a 70 metre alteration zone with sections of extensive quartz veining; sulphide mineralisation and visible gold.

Results for the Roswell-San Antonio infill, El Paso and McLeans South holes will be released over the next two months once they are finalised.



Visible gold in RWD003 at 267.7 metres



A substantial RC and core drill out program of around 50,000 metres has been planned to commence as soon as practical.

### Peak Hill Gold Mine (PHGM)

Ten large diameter (PQ) core holes (2,775 metres) have been completed on the Proprietary deposit to confirm high grade structural zones and provide samples for metallurgical test work. The core is currently being geologically logged and sampled with results anticipated over the coming two months.

## CORPORATE

### Cash, Bullion and Listed Investments

Description	Mar-19 Quarter A\$M	Dec-18 Quarter A\$M	Sep-19 Quarter A\$M
Cash	72.4	73.7	59.6
Bullion	1.8	2.0	22.8
Cash and bullion sub-total	74.2	75.7	82.4
Listed investments	4.6	4.8	-
Total cash, bullion and listed investments	78.8	80.5	82.4

In accordance with its strategy of investing part of its cash balance in junior gold mining companies and projects that meet its investment criteria, namely potential investments that have high exploration potential and/or require near term development funding, the Company continues to hold its investment into gold exploration company Calidus Resources Limited (ASX:CAI). As at the end of the quarter the Company now holds ~145M CAI shares which is equivalent to ~10.2% of the currently issued capital.

The Company continues to evaluate other opportunities for investment.

### Gold Forward Sale Contracts & Puts

During the quarter the Company entered into a further 11,500 ounces of forward contracts at an average price of \$1,849/oz for delivery over the period June 2019 to March 2021.



At the end of the quarter the Company holds the following forward sale contracts;

Quarter	Average Forward Price A\$/oz	Delivery Ounces
June 2019	1,825	3,000
December 2019	1,804	2,000
March 2020	1,803	3,500
June 2020	1,801	4,500
September 2020	1,796	3,750
December 2020	1,801	4,500
March 2021	1,844	3,750
<b>Total</b>	<b>1,810</b>	<b>25,000</b>

In addition, the Company holds 10,400 oz of put options priced at A\$1,800/oz to manage expected revenue from processing the low-grade stockpiles.

## **DUBBO PROJECT – zirconium, hafnium, niobium, yttrium, rare earth elements**

*Australian Strategic Materials Ltd (ASM) 100%*

The Dubbo Project (DP) remains construction ready, with the mineral deposit and surrounding land wholly owned, all material State and Federal approvals in place, an established flowsheet and a solid business case.

### **Financing**

ASM's key focus is on securing offtake contracts for its products and a resultant strategic investor in the project. These contracts are dependent on the risk and investment appetite of third parties.

### **Engineering**

The projects engineering is substantially complete such that execution options (staged versus full build) can be matched to the level of offtake contacts obtained. There is minimal spend occurring in this area.

### **Product Development**

#### *Zirconium*

Feedback from key customers on zirconium samples is expected shortly, and some larger quantities of product will be supplied in the June quarter.

#### *Hafnium*

Increasing interest in larger quantities of hafnium samples has also been received, with plans to produce additional quantities from existing product stocks.

#### *Metallisation*

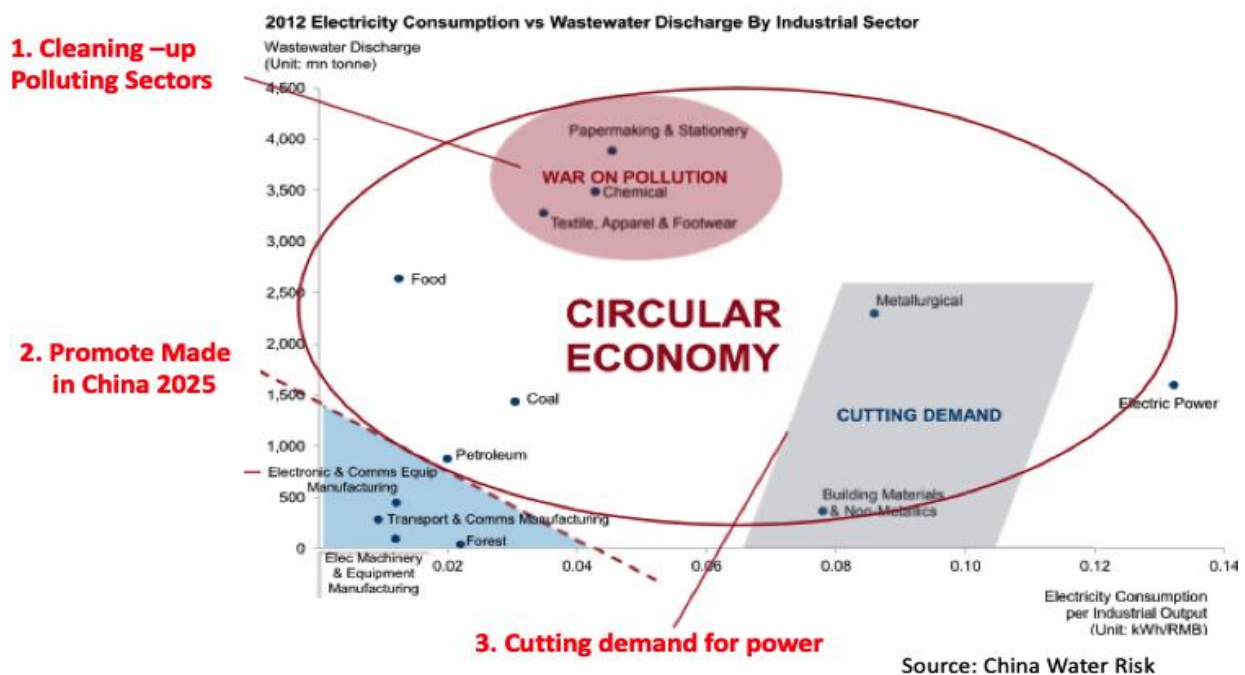
Further progress on metallisation of Dubbo Project zirconium oxide, hafnium oxide, and magnet rare earths oxides has been made during the quarter, with small test samples expected to be available in the near future for customer evaluation.

### **Product Marketing**

#### *Northern China's water crisis*



A better understanding of China's roadmap for a circular economy shows the "war on pollution", Made in China 2025, and reducing demand for power are part of managing China's limited water resources for a sustainable future. The implications for China's chemicals industries and the supply chains that depend on them are profound, as China targets its most polluting industries that are energy intensive and consume vast quantities of water. Textiles are already targeted and affected, while paper making and chemicals are next to attract scrutiny.



Northern China is likely to be most affected as water shortages are at crisis levels. According to [China Water Risk](#), the 11 driest provinces are in northern China. Home to 38% of the population, these provinces account for 36% of agricultural output, 47% of industrial output and 43% of GDP, yet have only 7% of the country's water resources. To meet demand, the Chinese have been extracting groundwater at unsustainably high rates. The driest 11 provinces rely on groundwater for 28% of water needs, compared to just 13% for the 13 most water-secure provinces, which are mostly in the south.

China's dry northern provinces are also home to two-thirds of China's zirconium capacity, which is water intensive with over 30 m<sup>3</sup> of water required to produce 1 tonne of zirconium oxychloride (ZOC), the main chemical precursor for zirconium chemicals. Parched [Shandong province](#) accounts for 52% of ZOC capacity alone. With a population of around 100 million, Shandong province has only 250 m<sup>3</sup> of water per person – less than most countries in the Middle East. Less than 500 m<sup>3</sup> of water per person is considered a critical shortage. Similarly, most of China's rare earths production occurs in Inner Mongolia, where water supply is also under stress, despite relatively low population density. This heightens risks for zirconium chemicals and rare earths supply disruption, where China accounts for ~95% and 80% of global supply, respectively.

### **Offtake agreements**

With few alternatives to China for zirconium chemicals and rare earths, offtake agreement discussions for the Dubbo Project have progressed significantly during the first quarter, particularly for zirconium/hafnium chemicals which account for over 50% of revenue. Most companies have been unaware of the water crisis in Northern China, which is in addition to the crackdown on pollution from waste water, plus liquid and solid waste materials. The combination of high water consumption in the driest provinces, plus multiple waste streams, makes the Dubbo Project very attractive to those companies seeking to reduce China's supply risks.

Marketing visits were made to the United States, Japan and Korea during the quarter. Alkane also attended the Minor Metals Trade Association's conference in Edinburgh, Scotland in early April, with a



number of positive meetings about offtake for chemicals, oxides, and metal products. Follow up meetings are planned in coming weeks.

### *Zirconium*

With stable zircon prices, ZOC prices traded in a narrow range during the quarter, with some weakness around Chinese New Year as companies reduced stock levels. ZOC prices are US\$2,350-2,500/t FOB China (us\$6.7 – 6.9/kg ZrO<sub>2</sub> equivalent). Unfortunately, chemical plant explosions in some provinces resulted in numerous fatalities, and caused the temporary suspension of several zirconium chemicals operations as authorities conducted inspections.

Concerns over proposed radioactivity limits of 1 Bq/g for fused zirconia may increase demand for chemical zirconia. Global fused zirconia production is about half of the total 160,000 tpa market for zirconium materials, so this could result in a significant increase in demand for Dubbo Project chemical zirconium products.

### *Hafnium*

Hafnium metal (max 1% Zr) prices increased ~10% during the quarter to US\$875-925/kg, in warehouse, Rotterdam, which supports Alkane's efforts on metallisation.

### *Rare Earths*

Magnet rare earth prices were mixed during the quarter, with Pr/Nd metals drifting lower to ~US\$53/kg, while Dysprosium metal and Terbium metal prices increased significantly to US\$260-270/kg, while Terbium metal stands at US\$606-615/kg. Suspension of ionic clay mining operations in southern provinces, combined with a ban on imports from Myanmar, are likely to support higher prices in the current quarter.

### *Niobium*

Spot ferro niobium prices continued to edge higher during the quarter to US\$48/kg, before drifting back to US\$44-46/kg as ferro vanadium prices fell further to almost match ferro niobium prices.

## **NORTHERN MOLONG PORPHYRY PROJECT (NMPP) (gold-copper)**

*Alkane Resources Ltd 100%*

RC and core drilling is scheduled to recommence at the Kaiser and Boda porphyry gold-copper prospects in May.

**GLEN ISLA (gold); ELSIENORA (gold); ORANGE EAST PROJECT (gold-copper); WELLINGTON (copper-gold); CUDAL (gold-zinc); ROCKLEY PROJECT (gold); TRANGIE (nickel-copper +); ARMSTRONGS (gold);** *Alkane Resources Ltd 100%.* Prospect activities were limited to data compilation and review, or preparation for field activities.

## **LEINSTER REGION JOINT VENTURE (nickel-gold)**

*Alkane Resources Ltd 19.4% diluting, Australian Nickel Investments Pty Ltd (ANI) 79.6%. Two prospects - **Miranda and McDonough Lookout.** ANI advised that no ground exploration was completed during the quarter.*





## Competent Person

Unless otherwise advised above or in the Announcements referenced, the information in this report that relates to exploration results, mineral resources and ore reserves is based on information compiled by Mr D I Chalmers, FAusIMM, FAIG, (director of the Company) who has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Chalmers consents to the inclusion in this report of the matters based on his information in the form and context in which it appears.

## Disclaimer

This report contains certain forward looking statements and forecasts, including possible or assumed reserves and resources, production levels and rates, costs, prices, future performance or potential growth of Alkane Resources Ltd, industry growth or other trend projections. Such statements are not a guarantee of future performance and involve unknown risks and uncertainties, as well as other factors which are beyond the control of Alkane Resources Ltd. Actual results and developments may differ materially from those expressed or implied by these forward looking statements depending on a variety of factors. Nothing in this report should be construed as either an offer to sell or a solicitation of an offer to buy or sell securities.

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**ABOUT ALKANE** - [www.alkane.com.au](http://www.alkane.com.au) - ASX: ALK and OTCQX: ANLKY

Alkane is a gold production company with a multi-commodity exploration and development portfolio. Alkane's projects are predominantly in the Central West region of NSW, but extend throughout Australia.

Alkane's gold production is from the Tomingley Gold Operations (TGO) which has been operating since early 2014. Alkane has investments in other gold exploration and development companies.

Alkane's most advanced gold exploration projects are in the 100% Alkane owned tenement area between TGO and Peak Hill and have the potential for sourcing additional ore for TGO. Alkane has other 100% owned exploration tenements in Central Western NSW prospective for gold and copper.

Alkane's largest non-gold project is the Dubbo Project (DP), a large in-ground resource of zirconium, hafnium, niobium, yttrium and rare earth elements. As it is an advanced polymetallic project outside China, it is a potential strategic and independent supply of critical minerals for a range of sustainable technologies and future industries. It has a potential mine life of 75+ years. The DP is development ready, subject to financing, with the mineral deposit and surrounding land acquired and all major State and Federal approvals in place.

