

20 October 2017



## Quarterly Activities Report to 30 September 2017

---

### *Dubbo Project (DP)*

- The modularised build study being conducted by specialist engineers, particularly Outotec, will be completed in the current quarter.
- Upward price movements in the zirconium chemicals and powders, and rare earth magnet markets have continued.

### *Tomingley Gold Operations (TGO)*

- Strong gold production in the quarter of 24,122 ounces at an AISC of A\$982/ounce continued the excellent performance from the preceding quarter.
- Site operating cash flow after development costs for the quarter was A\$14.0M.
- Quarter Results
  - Gold production was above forecast at 24,122 ounces
  - Site operating cash costs were A\$766/ounce with all in sustaining costs (AISC) of A\$982/ounce
  - Gold sales 21,610 ounces for revenue of A\$36.4 million at an average price of A\$1,685/ounce
  - Gold forward contracts at 30 September 2017 of 4,500 ounces at average price of A\$1,720/ounce.
- Full year guidance for FY2018 remains unchanged at 65,000 to 70,000 ounces of gold at an AISC of A\$1,100 to A\$1,200.

### *Corporate*

- The Group's cash position totalled A\$53.3M with A\$46.3M in cash and bullion on hand at fair value of A\$7.0M, an increase of A\$8.4M from the previous quarter.
- Nic Earner was appointed to the Board as Managing Director, Ian Chalmers becomes Technical Director.
- John Dunlop retired from the Board, Ian Gandel takes the role of non-executive Chairman.

---

CONTACT : NIC EARNER, MANAGING DIRECTOR, ALKANE RESOURCES LTD, TEL +61 8 9227 5677  
INVESTORS : NATALIE CHAPMAN, CORPORATE COMMUNICATIONS MANAGER, TEL +61 418 642 556  
MEDIA : HILL KNOWLTON STRATEGIES, CONTACT: IAN WESTBROOK, TEL +61 2 9286 1225 OR +61 407 958 137



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

*Australian Strategic Materials Ltd (ASM) 100%*

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

### ***Financing***

ASM continues to work to finance the project, with the increase in prices of the project's major products, discussed below, generating renewed interest from investors and customers. ASM is focused on:

- Securing offtake contracts for its products
- Securing a strategic investor in the project, in particular an investor who has a long term interest in the project's products
- Updating its financial models to show the project's ability to carry debt and then working with commercial debt providers
- Engaging with Export Credit Agency (ECA) finance teams

ASM has continued to present to numerous local and international fund managers and customers.

The ability of the DP to provide long term sustainable security of supply of a diverse range of over 15 critical metals and oxides is recognised. The diversity of products and markets, whilst requiring specialist processing, does provide stability of revenue streams over a broad base as different markets cycle through ups and downs over time.

### ***Engineering***

The project remains ready for detailed design and construction to commence, contingent on financing.

ASM continues to work with engineers, particularly Outotec, to refine the existing engineering to provide highly accurate costing for the processing section of the project using the modularised build philosophy, allowing the Company to quickly commence the construction phase following financing. This work is expected to conclude in the current quarter.

ASM continues to work to refine its product suite to match end customer requirements, with additional samples expected to be released in the current quarter.

### ***Marketing Developments***

#### **Vietnam Rare Earths JSC (VTRE)**

The processing of small purchased parcels of concentrate at VTRE has been completed and ASM is now discussing sales and logistics with potential customers. This process forms part of the extended due diligence of downstream toll treatment, allowing evaluation of both the physical separation process capability as well as the business processes through to the end customers.

### ***Product Marketing***

Meetings with major consumers of zirconium, hafnium, and rare earths in Europe, USA and Japan were held during the quarter. Most customers are acutely aware that China supplies over 90% of zirconium chemicals and over 80% of rare earths supply, and the essential need for alternative supply sources. Customers have experienced a steady increase in prices this year from China, as well as periods of



interrupted supply, which have highlighted supply chain risks and the importance of the DP. An additional LOI was signed during the quarter for zirconium products, with further LOIs under discussion.

Marketing efforts in October included a presentation at the Materials Science and Technology Conference in Pittsburgh, with other associated meetings and visits in the United States. The Company will also be presenting at the Metal Events Rare Earths Conference and TZMI Congress in Hong Kong in November. Both of these conferences will be attended by key stakeholders and companies buying rare earths, zirconium and hafnium products, with multiple meetings already confirmed.

### ***Market Developments***

China's continuing "war on pollution" via strict environmental inspections is having far reaching effects on supply of all types of chemicals, including zirconium and rare earths. Reported shortages in availability of zirconium oxychloride (ZOC) have increased delivery times, and raised concerns about ongoing supply, with some suppliers said to have given priority to domestic ahead of export customers. This has triggered "alarm bells" for rest of world companies and highlighted the urgency to diversify supply. Enforcement of environmental regulations and monitoring of production activities, including the handling and treatment of waste streams is expected to continue. Efforts to reduce air, water and soil pollution has resulted in scores of companies and individuals being prosecuted, with China's Ministry of Environmental Protection releasing a continuous stream of news releases on inspection activities and results of past campaigns. Northern China, particularly Shandong province with its proximity to Beijing and Shanghai, is a constant focus of attention and is under intense pressure to meet clean air targets. Shandong province is also responsible for over 50% of zirconium chemicals production capacity in China, so ongoing scrutiny is expected to affect supply and continue the trend towards increased production costs and fewer producers.

ZOC is a key indicator for zirconium chemical prices as it is the primary precursor for producing downstream zirconium chemicals and zirconium dioxide products worldwide. Following a 40% increase in ZOC prices in the first half of 2017, prices are now over 60% higher compared to the end of last year and are currently ~US\$2,400/t, or approximately US\$6,700/t on a 100% zirconia basis. The increase in prices is even more dramatic for zirconium carbonate, which has almost doubled in price from the lows of last year to US\$3,500/t, or US\$8,700/t on a 100% zirconia basis.

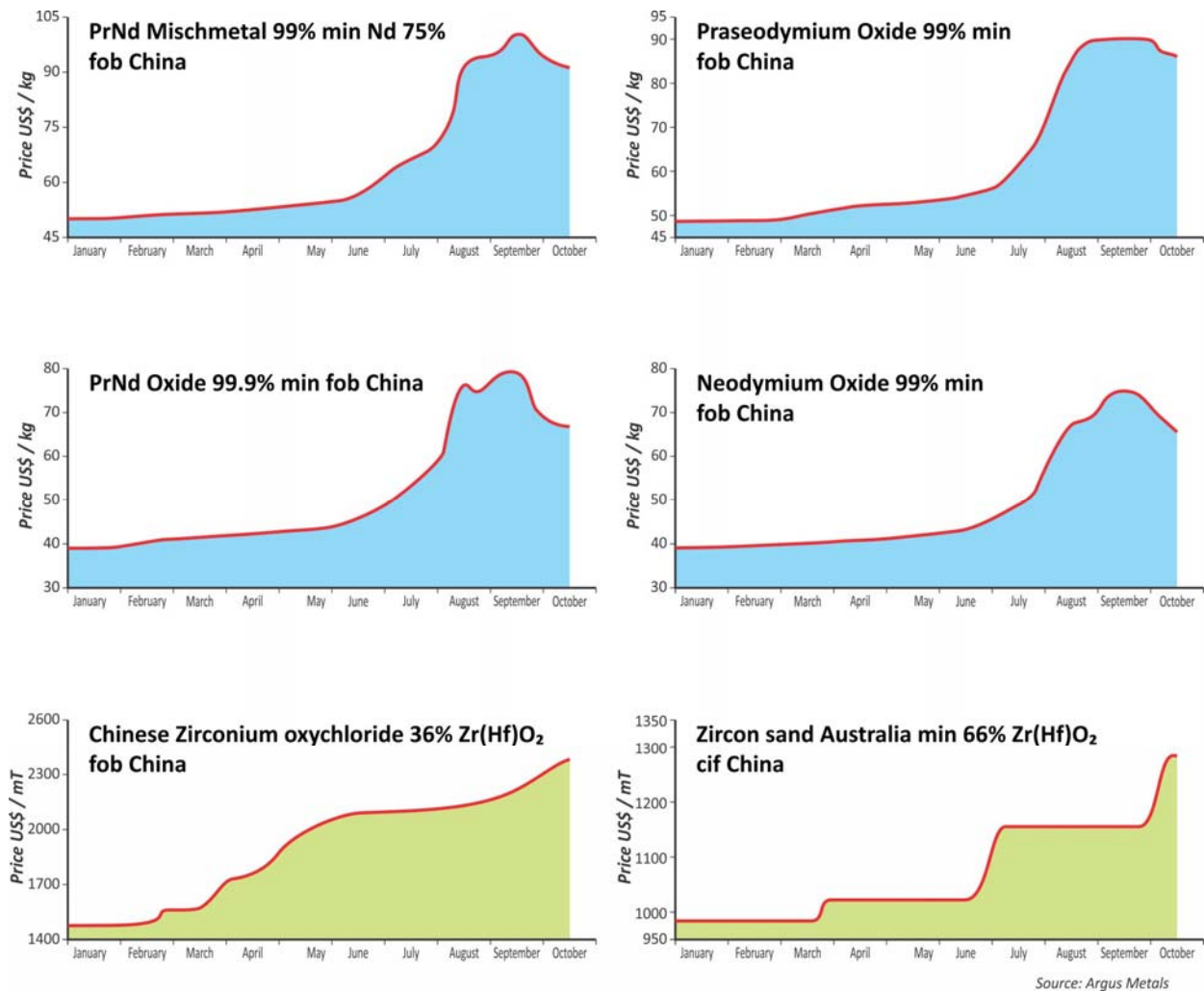
ZOC prices are expected to increase further due to higher raw material costs and the strict enforcement of environmental regulations and inspections. Zirconium silicate (zircon) is the key mineral source of zirconium and prices have increased by an additional US\$150/t for the December quarter, with further price increases expected in 2018. Some of the major producers are experiencing declining mineral sand ore grades with consequent reductions in output of zircon and associated increases in production costs. From a low of ~US\$850/t in early 2016, zircon prices are now US\$1,200-1,300/t, but still well below the peak in 2011 when prices reached US\$2,500/t or higher.

Chinese fused zirconia prices have also increased significantly this year and now exceed US\$4,000/t, due to higher zircon raw materials costs, as well as graphite electrode costs which have more than doubled in the past year.

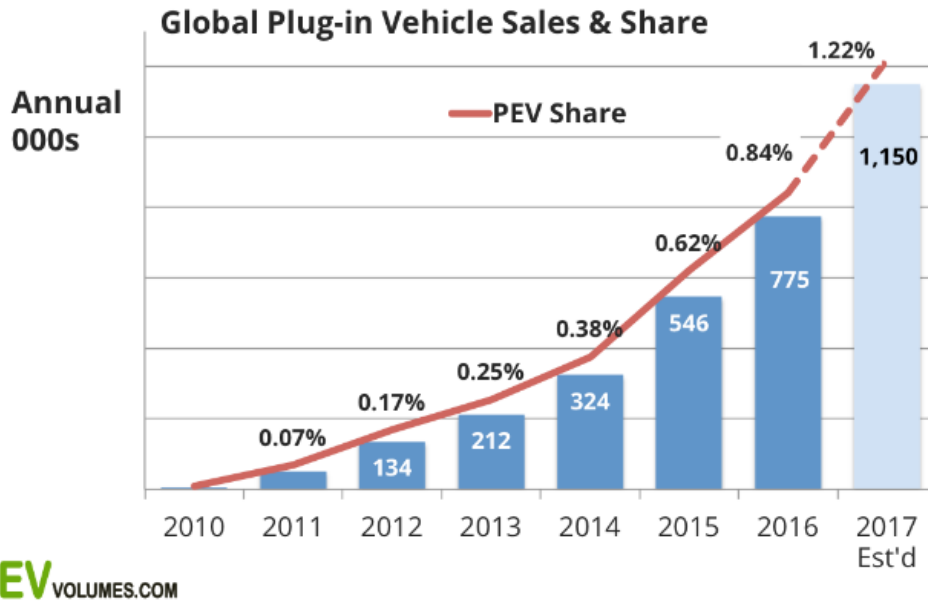
With China accounting for over 75% of global zirconium production from zirconium chemicals and fused zirconia, the structural changes now occurring as a result of tougher environmental standards and stricter compliance are expected to result in fewer producers and longer term sustainable prices. Against a background of increasing raw materials prices and a trend towards higher product prices, the DP will be an important alternative, with zirconium revenue accounting for approximately 40% of its total revenue.



In respect of rare earths, prices increased further during the quarter for PrNd mischmetal, the key rare earths for neodymium iron boron magnets (NdFeB), touching US\$100/kg in September before settling lower at US\$95/kg by the end of the quarter. Prices have since drifted lower in October to around US\$87/kg, but are up almost 80% since January. Prices for rare earths oxides have mirrored those for metals. The recovery in rare earths prices this year is important to restore profitability for the broader industry, which has run at a loss for the past 3-4 years. Approximately 30% of total DP revenue will come from rare earths, with over 80% of this from magnet rare earths. With the looming shortage of magnet rare earths as a result of high growth rates for existing and new applications, there will be continued pressure on supply outside China, which is very limited.



Electric vehicles (EV) are attracting growing media attention with growth rates accelerating in major markets of China, Europe, and USA. EVolumes.com forecasts global plug in vehicle sales to reach 1.15 million this year, with plug in volumes having more than tripled since 2013 following last year's growth rate of 42%. With the global market passing 1% market share this year, growth rates are set to increase further on the back of greater product offerings, lower prices, and higher range. Norway leads with 35% plug in share, followed by Iceland with 9% and Sweden with 4.5%. Up to 70% of all electric vehicles are forecast to be pure battery electric vehicles, which will increase demand for REPMs worldwide. The Company's presentation at the Metal Events conference in Hong Kong in November will be entitled "From horse power to e- power: The looming REPM shortage and consequences".



## TOMINGLEY GOLD OPERATIONS (TGO)

Tomingley Gold Operations Pty Ltd 100%

The TGO is based on four gold deposits (Wyoming One, Wyoming Three, Caloma and Caloma Two) located about 14 kilometres north of the Company's inactive Peak Hill Gold Mine, and approximately 50 kilometres southwest of Dubbo.

### Operations

TGO had another excellent quarter with continued releases of high grade ore from the Caloma Two pit, and releases from the next development stage of the Wyoming One pit. The Caloma One pit was completed during the quarter.

A total of 24,122 ounces of gold were poured for the quarter, with site cash costs of A\$766/oz and all in sustaining costs (AISC) of A\$982/oz. Guidance remains at 65,000 to 70,000 ounces of gold at an AISC of A\$1,100 to A\$1,200. Guidance for the coming quarter is 13,000 to 15,000 ounces of gold as the material that will be mined for the December quarter and the remainder of the year is at a lower grade than the September quarter.

The open cut pits are still scheduled to finish in Q1 FY2019. The mining fleet reduced in size at the end of the quarter to keep the costs low as the stripping ratio steadily decreases.

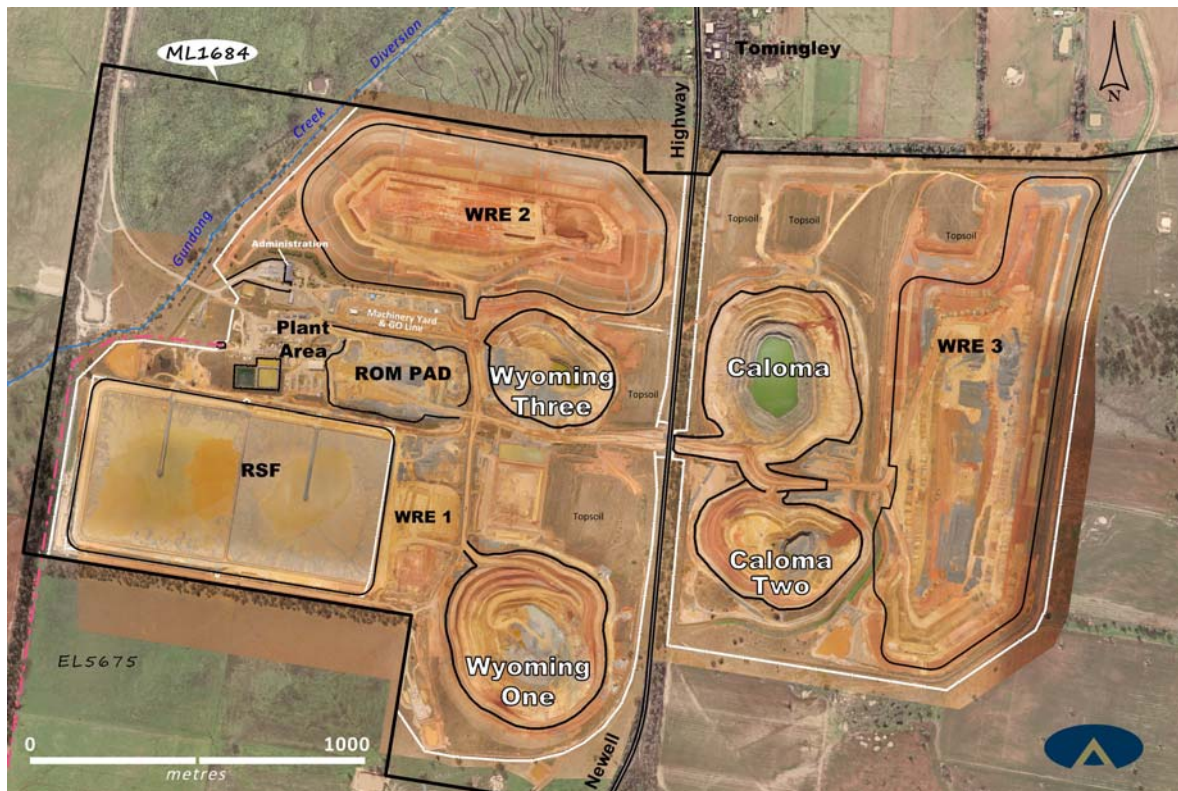
Gold sold for the quarter totalled 21,610 ounces at an average sales price of A\$1,685/oz generating revenue of A\$36.4 million. Bullion on hand increased by 2,489 ounces to 4,303 ounces (fair value at quarter end of A\$7.0 million). Site operating cash flow after development costs for the quarter was A\$14.0M. The hedge book at quarter end consisted of forward contracts for 4,500 ounces gold at an average forward price of A\$1,720/oz.



## TGO FY 2018 Quarterly Production Figures

TGO Production		FY 2017	Sep Quarter 2017	FY 2018
Waste mined	BCM	7,679,110	1,807,545	1,807,545
Ore mined	Tonnes	1,222,868	289,627	289,627
Strip Ratio	Ratio	16.6	16.0	16.0
Grade	g/t	2.08	2.55	2.55
Ore milled	Tonnes	1,087,983	281,191	281,191
Head grade	g/t	2.15	2.80	2.80
Recovery	%	91.5	92.7	92.7
Gold poured	Ounces	68,836	24,122	24,122
<b>Revenue Summary</b>				
Gold sold	Ounces	69,929	21,610	21,610
Average price realised	A\$/oz	1,678	1,685	1,685
Gold revenue	A\$M	117.3	36.4	36.4
<b>Cost Summary</b>				
Mining	A\$/oz	748	501	501
Processing	A\$/oz	295	208	208
Site Support	A\$/oz	84	56	56
<b>C1 Site Cash Cost</b>	<b>A\$/oz</b>	<b>1,127</b>	<b>766</b>	<b>766</b>
Royalties	A\$/oz	49	54	54
Sustaining capital	A\$/oz	47	34	34
Rehabilitation	A\$/oz	71	97	97
Corporate	A\$/oz	41	31	31
<b>AISC<sup>1</sup></b>	<b>A\$/oz</b>	<b>1,335</b>	<b>982</b>	<b>982</b>
Bullion on hand	Ounces	1,814	4,303	4,303
<b>Stockpiles</b>				
Ore for immediate milling	Tonnes	761,829	770,136	770,136
Grade	g/t	0.95	0.86	0.86
Contained gold	Ounces	23,300	21,086	21,086

<sup>1</sup>AISC = All in Sustaining Cost comprises all site operating costs, royalties, mine exploration, sustaining capex, mine development and an allocation of corporate costs, on the basis of ounces produced. AISC does not include share based payments or net realisable value provision for ore inventory.



TGO site image at 11 October 2017

### ***Underground Mining Study***

The drilling program targeting strike extensions and in-fill areas with the aim of lifting the gold ounces per vertical metre in any future designs continued with completion expected in the December quarter. At that time the geological models will be updated and a mine plan evaluated for development.

### ***Regional Exploration***

Regional air core drilling recommenced in May 2017 to infill previous air core drilling traverses to 400m apart where elevated gold and/or arsenic geochemistry had been intersected. The drilling consisted of 46 holes totaling 3,582m and intersected alteration and veining hosted within the prospective Mingelo Volcanic belt consistent with the previous air core drilling results at the El Paso (previously named Eulinda Park) and Buddong prospects.

Mineralisation at El Paso has been identified over a strike length of at least 1200 metres being open to the north where land access difficulties hampered the regional air core program. Approximately 2.5 km of the prospective belt within 5 km of the TGO remains untested.

Significant air core results include:

EPAC089	11 metres grading 2.82g/t Au from 32 metres (base of alluvium)
incl	2 metres grading 12.39g/t from 32 metres
and	10 metres grading 0.95g/t Au from 80 metres
incl	4 metres grading 1.76g/t Au from 82 metres

A small RC drilling program of 464m tested the oxide mineralisation in fresh rock at El Paso. The alluvial cover sequence is approximately 25 – 65 m deep and provides challenging drilling conditions with four of the five holes attempted not reaching target depth. RC drilling remains a priority and further drilling options are being considered.



Significant RC results include:

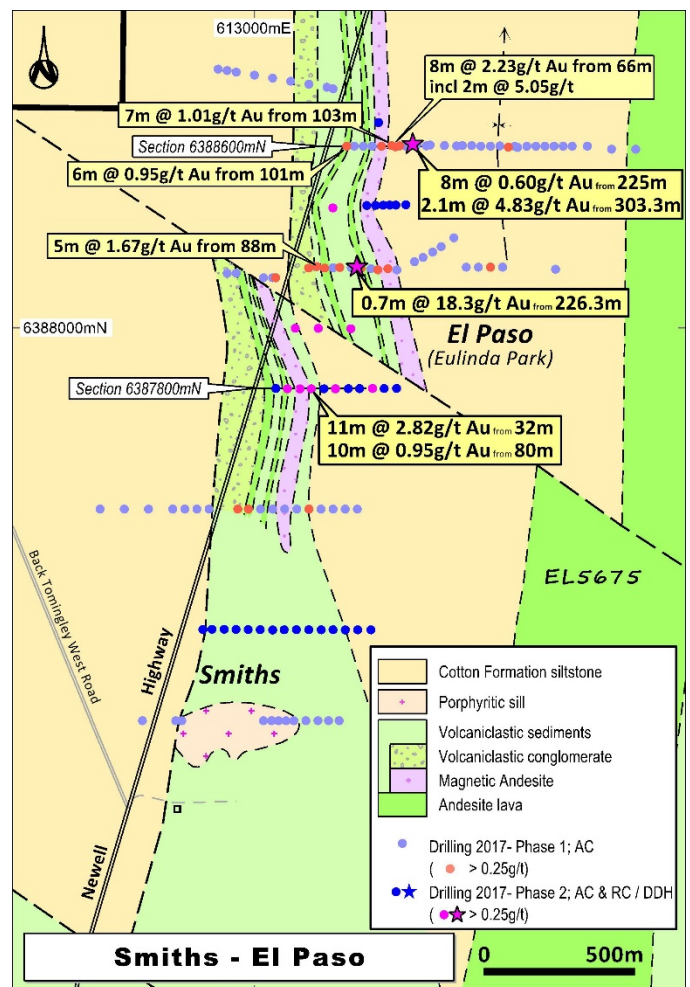
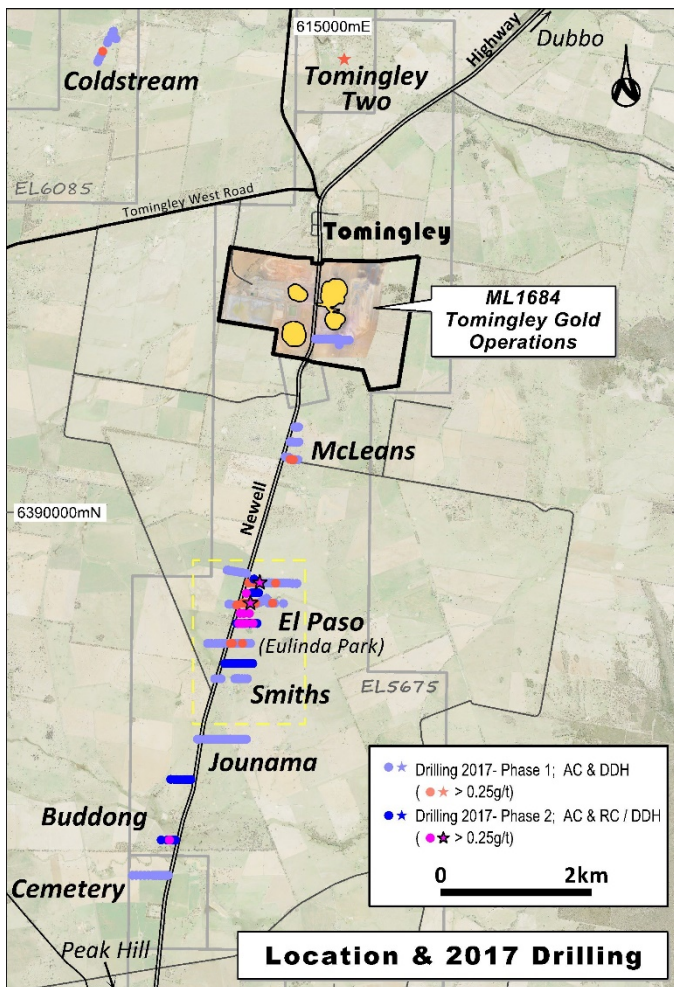
- EPP002 5 metres grading 0.71g/t Au from 197 metres
- EPP004 6 metres grading 1.07g/t Au from 48 metres (base of alluvium)
- EPP005 3 metres grading 1.68g/t Au from 66 metres
- and 3 metres grading 1.02g/t Au from 147 metres (to end of hole)

Two diamond core drill holes totaling 791m tested the stratigraphy and structures at depth at El Paso. The core drilling confirmed that the same volcanic stratigraphy which hosts the ore deposits at TGO (Mingelo Volcanics) is present at El Paso. The TGO orogenic style gold mineralisation is focused on structural zones generated by a competency contrast between 'brittle' porphyritic andesite sills and the 'ductile' volcanoclastic sediments. El Paso core drilling (EPD002) also intersected a magnetic porphyritic andesite hosting a broad zone of magnetite destructive quartz veining, carbonate-sericite alteration and sulphides (pyrite and arsenopyrite). Numerous thin zones of mineralisation were also intersected within the 'ductile' volcanoclastic sediments.

Significant diamond core results include:

- EPD001 0.7 metres grading 18.3g/t Au from 226.3 metres
- EPD002 8.0 metres grading 0.60g/t Au from 225 metres (within porphyry andesite host)
- and 2.1 metres grading 4.83g/t Au from 303.4 metres

Full details are available in the ASX Announcement 10 August 2017.







## NORTHERN MOLONG PORPHYRY PROJECT (NMPP)

### includes BODANGORA, KAISER and FINNS CROSSING PROPERTIES (gold-copper)

Alkane Resources Ltd 100%

During the quarter two diamond holes tested the Kaiser and Boda Prospects. Previous shallow drilling has identified a small, porphyry style gold-copper deposit (no JORC classification) at Kaiser.

Full details are given in the ASX Announcement 15 August 2017.

#### Boda Prospect

A single diamond drill hole (KSDD001, 801.5m) was drilled to test the depth extent of gold-copper mineralisation identified in RC drilling at the southern end of the Boda Prospect (130m @ 0.23g/t Au, 0.18% Cu KSRC021; ASX Announcement 3 April 2017). The drill hole identified a steeply east dipping sequence with the recognition of epithermal gold mineralisation overprinting the earlier gold-copper porphyry event. The epithermal mineralisation is characterised by gold-rich pyritic stringers associated with a distinctive pathfinder element suite (Au+As+Bi+Te+Se), an association also noted at the Duke Prospect nearby.

The gold-rich pyritic stringers combined with the distinctive element association is consistent with that described for intermediate sulphidation epithermal systems overlying porphyry systems and shows several similarities with the Cowal Gold Deposits (164.12Mt @ 0.96g/t gold, Evolution Mining 2016).

KSDD001	6m @ 2.14g/t gold from 483m
within	33m @ 0.51g/t gold from 476m
within	68m @ 0.35g/t gold from 476m

This interpretation defined several additional porphyry/epithermal exploration targets (including Boda North and Boda West) which remain untested.

The identification of epithermal mineralisation in this initial diamond drilling campaign is considered significant due to:

- the main extensive zone of epithermal gold defined in RC drilling at the Boda Prospect (311m @ 0.28g/t Au from 19m to EOH in KSRC018; ASX Announcement 6 May 2016) remains untested down dip (i.e. future drilling in the Boda area will be directed towards the west)
- this mineralisation style has the potential to carry high gold grades, as demonstrated by 4m @ 9.69g/t Au from 110m in KSRC013 at the nearby Duke Prospect (ASX Announcement 6 May 2016)

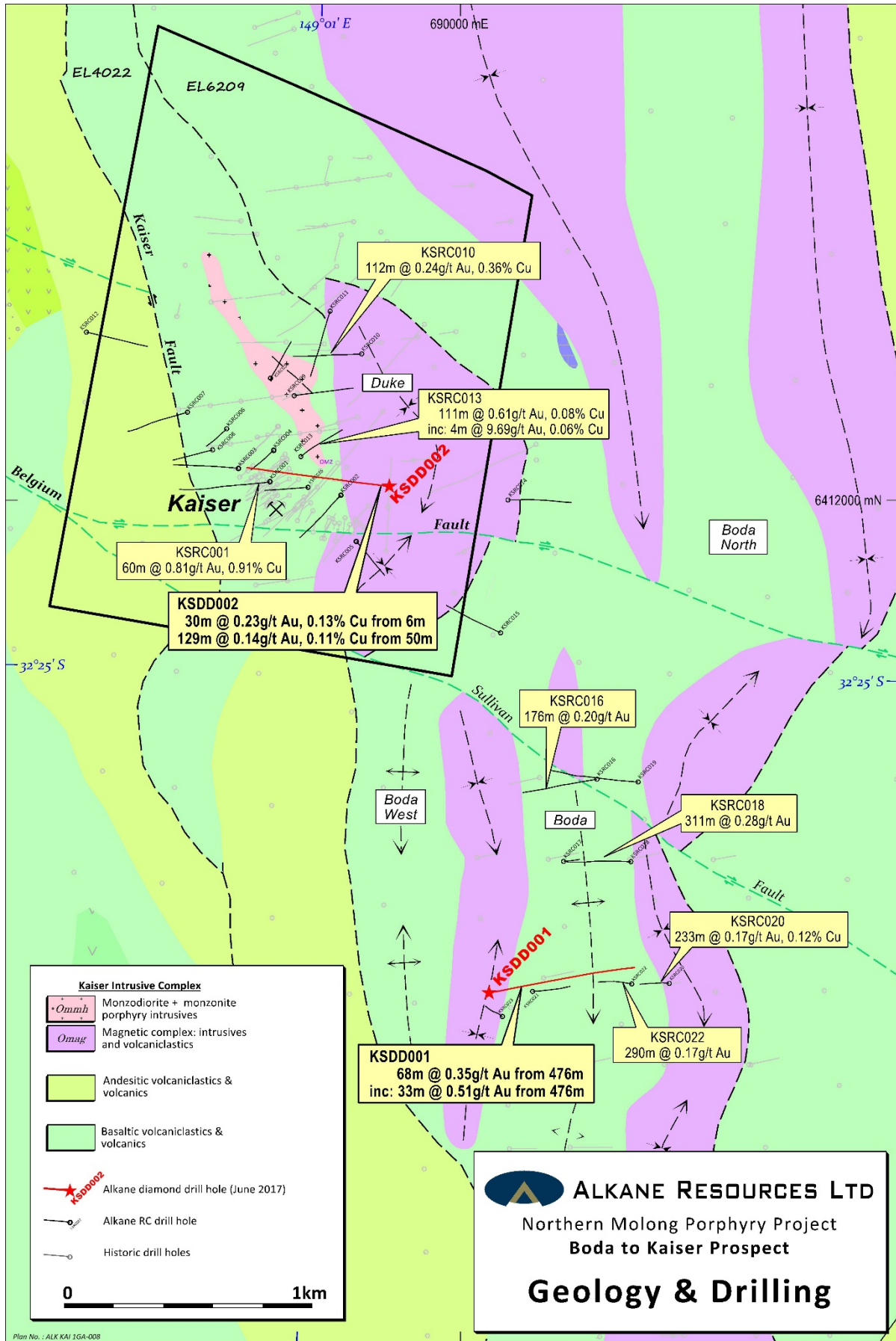
#### Kaiser Prospect

A single diamond drill hole (KSDD002, 591m) was drilled to test the depth extents at the Kaiser prospect and returned intervals of low grade porphyry mineralisation, including:

KSDD002	30m @ 0.23g/t gold, 0.13% copper from 6m
and	129m @ 0.14g/t gold, 0.11% copper from 50m
inc	23m @ 0.41g/t gold, 0.19% copper from 69m
and	142m @ 0.07g/t gold, 0.13% copper from 195m
and	2m @ 0.52g/t gold, 0.78% copper from 485m

The core hole was located at the north end and below the small porphyry style gold-copper deposit (no JORC classification) and further 3D modelling is required in this structurally complex target area.

A program comprising an Induced Polarisation (IP) survey and two diamond core holes is scheduled to commence in November at the Boda target.





**ELSIENORA (gold); ORANGE EAST PROJECT (gold-copper); WELLINGTON (copper-gold); CUDAL (gold-zinc); ROCKLEY (gold)** were inactive during the quarter.

### **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 have advised that a four drill-hole (RC) program designed to test for nickel sulphide occurrences within ultramafic host units along the western portion on the Miranda tenement is scheduled to commence late October.

### **CORPORATE**

The Group's cash position totalled A\$53.3M with A\$46.3M in cash and bullion on hand at fair value of A\$7.0M, an increase of A\$8.4M from the previous quarter.

The Group is now debt free and the performance bond facility terminated with all performance bonds now cash backed.

During the quarter, Ian Chalmers stepped down as Managing Director making way for the appointment of the Group's Chief Operations Officer, Nicholas Earner, in his place. The Board considers the Company to be fortunate in retaining both Mr Earner's energy and expertise in his new leadership role and Mr Chalmers' geological expertise and knowledge of the DP, its products and markets in his new role as Technical Director.

Also during the quarter, John Dunlop retired as a director and Chairman of the Company and Ian Gandel has assumed the role of non-executive Chairman to steer the Company through the crucial funding stage of the Dubbo Project.

### **Competent Person**

*Unless otherwise advised above, 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.*

*This document has been prepared in accordance with the requirements of Australian securities laws, which may differ from the requirements of United States and other country securities laws. Unless otherwise indicated, all ore reserve and mineral resource estimates included or incorporated by reference in this document have been, and will be, prepared in accordance with the JORC classification system of the Australasian Institute of Mining, and Metallurgy and Australian Institute of Geoscientists.*



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

Alkane is a multi-commodity company focused in the Central West region of NSW, Australia. Currently Alkane has two advanced projects - the Tomingley Gold Operations (TGO) and the nearby Dubbo Project (DP). Tomingley commenced production early 2014. Cash flow from the TGO has provided the funding to maintain the project development pipeline and will assist with the pre-construction development of the DP.

The NSW Planning Assessment Commission granted development approval for the DP on 28 May 2015 and on 24 August 2015 the Company received notification that the federal Department of the Environment gave its approval for the development. Mining Lease 1724 was granted on 18 December 2015 and the Environment Protection Licence was approved on 14 March 2016. Financing for this project is in progress and when completed should make Alkane a strategic and significant world producer of zirconium, hafnium and rare earth products with production targeted for 2019-20.

Alkane's most advanced gold copper exploration projects are at the 100% Alkane owned Bodangora, Wellington and Elsenora prospects. Wellington has a small copper-gold deposit which can be expanded, while at Bodangora a large monzonite intrusive complex has been identified with porphyry style gold copper mineralisation. Gold and base metal mineralisation has been identified at Elsenora.

