

## Quarterly Activities Report for period ending 30<sup>th</sup> June 2018

### Highlights:

#### Gabanintha Project

- MoU signed with Chinese steel and alloy product company Win-Win Development Group for potential finance of vanadium offtake.
- Cobalt, Nickel and Copper in a sulphide concentrate added to Vanadium resource at Gabanintha.
- Updated Mineral Resource at Gabanintha Vanadium Project released:
  - Revised Gabanintha Mineral Resource includes a distinct massive magnetite high-grade zone of **93.6 Mt at 1.00% V<sub>2</sub>O<sub>5</sub>**
  - Total Mineral Resource revised to **175.5 Mt at 0.77% V<sub>2</sub>O<sub>5</sub>**
  - Mineral Resource now includes an estimation of cobalt, nickel and copper with the initial Inferred Mineral Resource of **12.5 Mt at 206 ppm Co, 659 ppm Ni and 222 ppm Cu**.
  - The potential sale of a by-product cobalt, nickel and copper sulphide concentrate to increase revenue at Gabanintha.
- Todd Richardson appointed to a permanent role as Development Manager for Gabanintha Project studies currently underway.
- PFS study advancing with base case nearing completion.

#### VSUN Energy

- Expression of interest submitted to Western Power for its Stand-alone Power Systems' project covering 60 sites.
- Appointment of graduate Energy Data Modeller to support technical battery modelling and sales.

#### Corporate

- Vanadium prices reach 10 year high during the quarter
- 1,437,935 of 2 cent 31-Dec-2018 Listed Options exercised, raising \$28,758 during the quarter.
- Cash position of \$5.16M. Use of funds to focus on PFS deliverables.

23.07.2018

#### ASX ANNOUNCEMENT

#### Australian Vanadium Limited

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#### Projects:

Gabanintha – Vanadium  
Coates – Vanadium  
Blesberg – Feldspar/Lithium/Tantalum  
Nowthanna Hill – Uranium/Vanadium



Activities for the June 2018 quarter for Australian Vanadium Limited (“AVL” or “the Company”) are as follows:

## **GABANINTHA VANADIUM PROJECT**

### **MOU signed with Win-Win Development Group**

The Company announced on 26<sup>th</sup> June 2018 that it had signed a Memorandum of Understanding (MOU) with Chengdu based, Chinese steel and alloy product company Win-Win Development Group. The agreement provides an understanding between the two companies to further discussions around project finance and purchase of vanadium for steel strengthening. Win-Win is currently building a 5,000 tonnes per annum (tpa) vanadium carbon nitride (VCN) production line which requires approximately 7,000-8,000tpa of 98% V<sub>2</sub>O<sub>5</sub>. The first stage will require 2,000-3,000tpa and be operational in 2019 and the second stage is planned for the following year. Win-Win has a shareholding in an operating production line currently producing 2,400tpa of VCN products for existing steel companies.

The timing of the Win-Win development and full production has strong synergies with the planned development of the Gabanintha Vanadium Project.



*Figure 1 Win-Win Management team with AVL at Win-Win Development Group Head Office in Chengdu*

### **Mineral Resource Update**

On 22<sup>nd</sup> May 2018, AVL announced the recovery of Cobalt, Nickel and Copper in a sulphide concentrate from the non-magnetic stream in bench-scale tests on fresh high-grade massive magnetite at Gabanintha. This adds another saleable battery metal opportunity to the Company’s flagship vanadium project. As a result of this work, the Company was able to announce a resource update on 5<sup>th</sup> July 2018 which outlined these by-product grades in addition to an increase in the Mineral Resource of the high-grade vanadium zone by 0.8Mt (0.9%).

The Company announced an Inferred Mineral Resource of 12.5Mt containing 202ppm Cobalt, 659ppm Nickel, 222ppm Copper<sup>1</sup> and 0.14% Sulphur.

<sup>1</sup> Nickel and Copper credits to Bryah Resources Limited (ASX: BYH)

The Inferred Mineral Resource is contained exclusively within the fresh massive high-grade zone (HG10) in Fault Block 20 of the resource model (see Figure 2). The base metal sulphide Mineral Resource is considered to be potentially economically recoverable following metallurgical test work conducted by the Company. The base metal sulphide mineralisation has consistently reported to the non-magnetic fraction during the separation of the vanadium bearing magnetite. This has effectively concentrated the sulphide minerals, enabling further concentration by flotation methods.

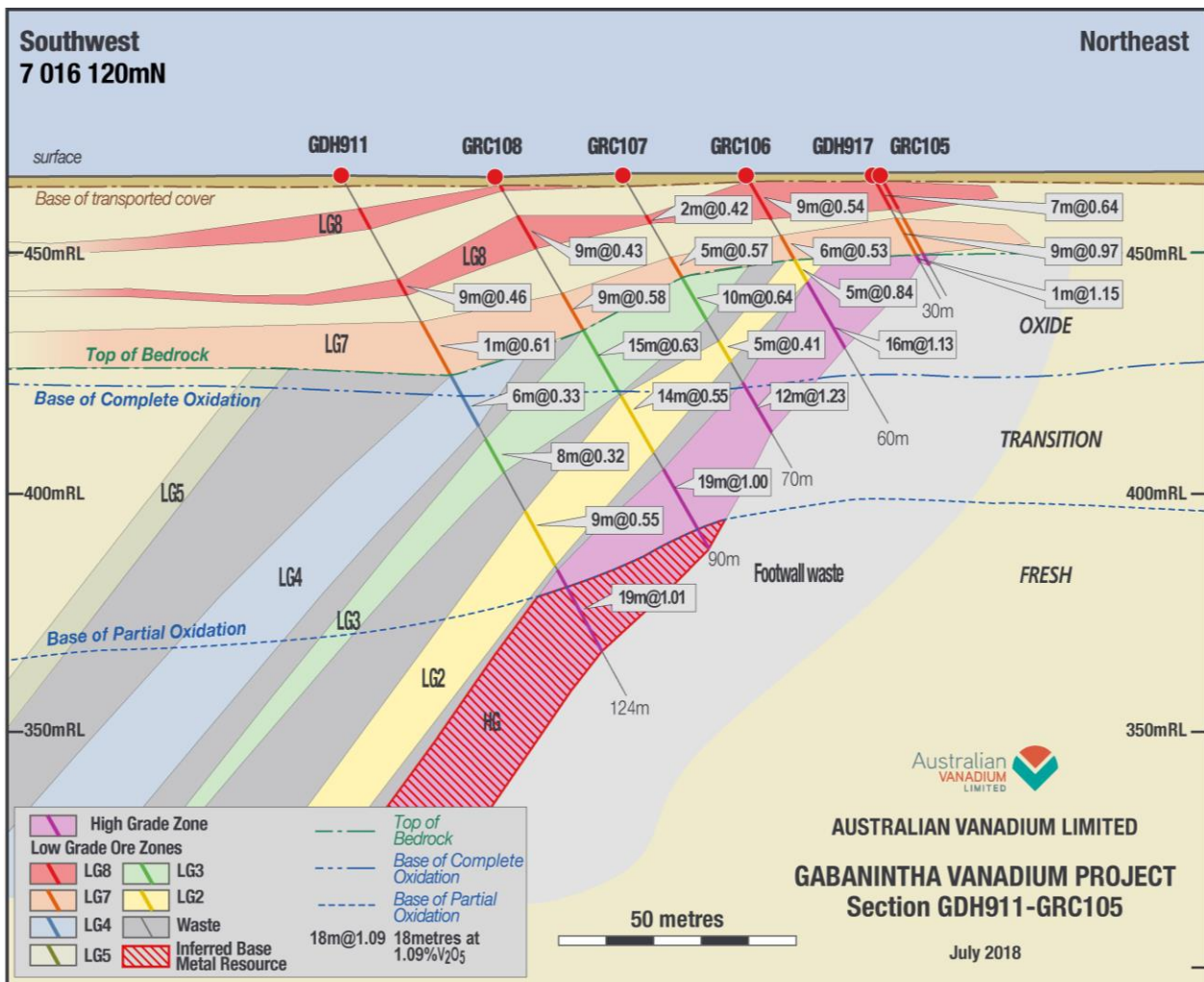


Figure 2 Cross Section at Northing 7016120m Showing Drill Intercepts, High-Grade and Low-Grade Domains, Weathering

The announcement included the following key information about the vanadium in the updated resource:

- **175.5 million tonnes at 0.77 %  $V_2O_5$**  containing 1,348,300 tonnes of  $V_2O_5$  (see Figure 3 for location map);
- A discrete high-grade zone of **93.6 million tonnes at 1.00%  $V_2O_5$**  containing 936,000t  $V_2O_5$ ;
- Discrete low-grade zones of 77.5 million tonnes at 0.50%  $V_2O_5$  containing 384,000t  $V_2O_5$ .
- Combined Measured and Indicated Mineral Resources of 34.1 million tonnes at 0.77%  $V_2O_5$  in low and high-grade domains containing 263,000t  $V_2O_5$ .
- The resource update included a summary of the resource by mineralized zone and oxidation state, factors critical to vanadium recovery and mineral processing design. The new information derived from the update is being used in the PFS currently underway.
- The updated mineral resource table is shown in Table 1 below.



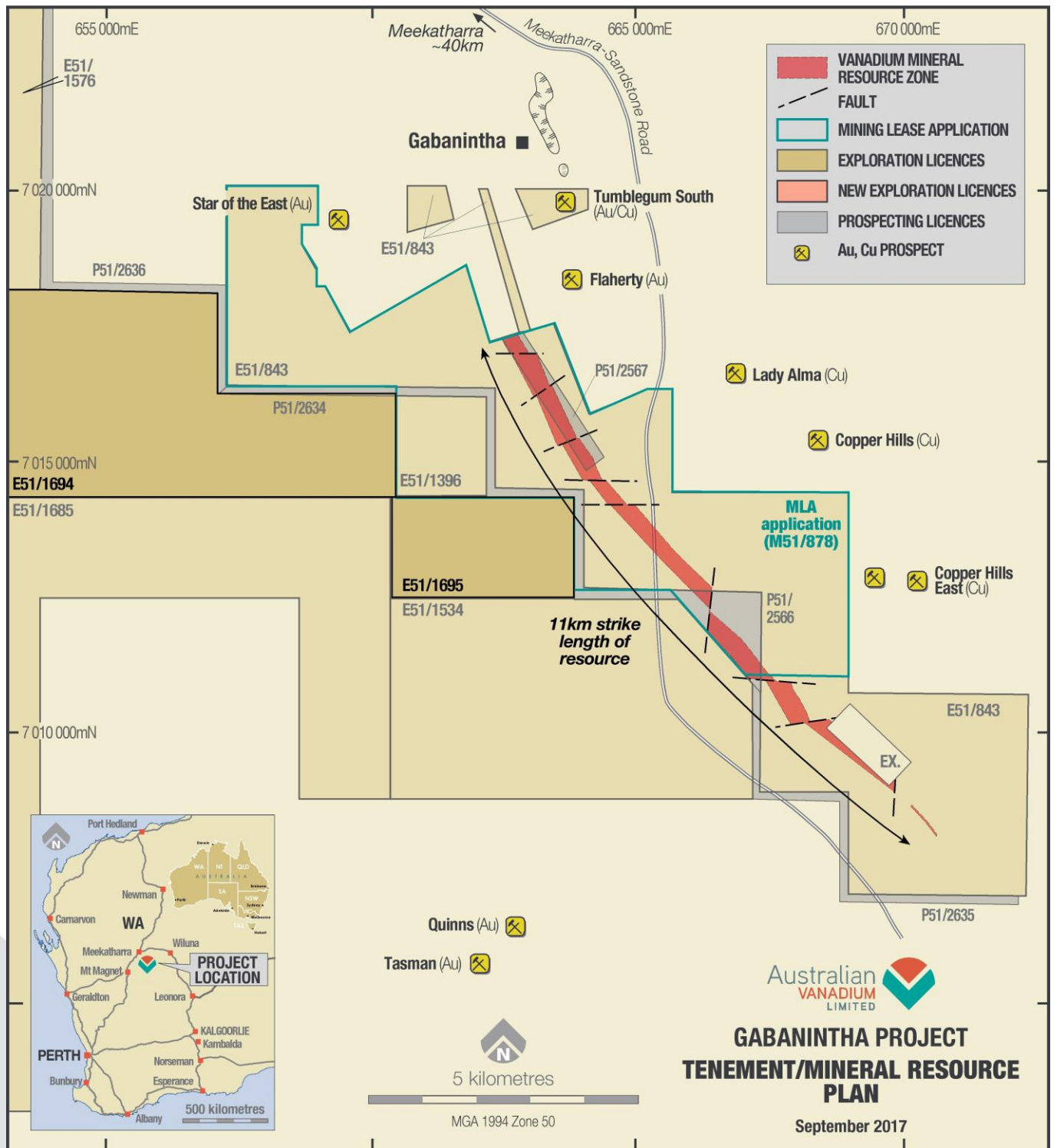


Figure 3 Location Diagram of the Gabanintha Project.

Table 1 Gabanintha Project – Mineral Resource estimate by domain and resource classification using a nominal 0.4% V<sub>2</sub>O<sub>5</sub> wireframed cut-off for low grade and nominal 0.7% V<sub>2</sub>O<sub>5</sub> wireframed cut-off for high grade (total numbers may not add up due to rounding)

Zone	Classification	Mt	V <sub>2</sub> O <sub>5</sub> %	Fe %	TiO <sub>2</sub> %	SiO <sub>2</sub> %	Al <sub>2</sub> O <sub>3</sub> %	LOI %
HG 10	Measured	10.1	1.11	42.7	12.6	10.3	8.0	4.0
	Indicated	4.9	1.09	43.3	12.1	10.5	7.8	3.7
	Inferred	78.6	0.98	42.4	11.2	11.4	7.6	3.4
	<b>Sub-total</b>	<b>93.6</b>	<b>1.00</b>	<b>42.5</b>	<b>11.4</b>	<b>11.3</b>	<b>7.6</b>	<b>3.5</b>
LG 2-5	Measured	-	-	-	-	-	-	-
	Indicated	19.1	0.51	23.9	7.0	27.8	18.1	8.7
	Inferred	58.5	0.49	25.5	6.7	27.5	16.5	7.4
	<b>Sub-total</b>	<b>77.5</b>	<b>0.50</b>	<b>25.1</b>	<b>6.8</b>	<b>27.5</b>	<b>16.9</b>	<b>7.7</b>
Transported 6-8	Measured	-	-	-	-	-	-	-
	Indicated	-	-	-	-	-	-	-
	Inferred	4.3	0.65	28.1	7.2	24.7	16.7	8.5
	<b>Sub-total</b>	<b>4.3</b>	<b>0.65</b>	<b>28.1</b>	<b>7.2</b>	<b>24.7</b>	<b>16.7</b>	<b>8.5</b>
Total	Measured	10.1	1.11	42.7	12.6	10.3	8.0	4.0
	Indicated	24.0	0.63	27.9	8.0	24.2	16.0	7.7
	Inferred	141.4	0.77	35.0	9.2	18.5	11.5	5.2
	<b>Sub-total</b>	<b>175.5</b>	<b>0.77</b>	<b>34.5</b>	<b>9.3</b>	<b>18.8</b>	<b>11.9</b>	<b>5.5</b>

### Activities focused on advancing Gabanintha towards feasibility

The release of the updated Mineral Resource statement supports the activities of the Company to advance the Gabanintha vanadium project. Key activities currently underway include:

- A Pre-Feasibility Study under the management of Wood Mining and Metals, external consultants and members of the AVL technical team.
- Initial metallurgical test work and process circuit design work are well advanced.
- Work is ongoing on the geo-metallurgical understanding of the mineralised domains to support processing circuit design, performance prediction and mine scheduling.
- Metallurgical test work has identified the opportunity to produce a base-metal rich sulphide (Co, Ni, Cu) concentrate by flotation from the non-magnetic tailings stream. Further work will be conducted to refine the resource opportunity, concentrate quality and economic benefit.
- A detailed mining study including pit optimisation and a preliminary assessment of an initial mine schedule is well advanced.
- Preparation is underway for ongoing optimization of the initial base case proposition.
- Determination of environmental constraints to the project and progress towards completion of a Native Title Mining Agreement and approval of a Mining Lease.

The Company will also incorporate results from additional research it will be conducting on vanadium electrolyte for use in vanadium redox flow batteries (VRFB). The manufacture of electrolyte is a process that can be achieved as part of the processing of vanadium ore. It offers the Company an opportunity to value-add to the project and develop a greater presence in the VRFB market.

## PFS Progress Update

Solid progress is being made on a robust PFS utilising a combination of in-house expertise and external consultants. The base case scenario is nearing completion and will be reported when available. This is the first step in a series of activities that will allow the Company to deliver a realistic and achievable study, supporting future investment decisions.

One of the aims of the PFS is to define a low-risk, low-cost process for production of high purity vanadium products. The Company has begun to build relationships with end users and interim product producers such as those making vanadium carbon nitride (VCN) and vanadium electrolyte for vanadium redox flow batteries. Relationship building with companies interested in the reported cobalt, nickel and copper by-product from the non-magnetic tailings is also underway.

The Company's intention is to produce a high quality PFS with a well-defined process flowsheet and is focused on de-risking the project to allow future investment. The PFS will include a robust options study to assure that the most viable, lowest cost mining and processing operation is pursued. The Company is basing the study on conservative economic assumptions and proven technologies. The goal is to develop a vanadium operation that is low-risk, low-cost and profitable in all business conditions.

Following the release of an initial base case for the project, detailed option analysis to maximise economic returns and reduce capital and operating costs will continue during the remainder of 2018. This will include new drilling for geotechnical and hydrology purposes and additional metallurgical test work on existing sample material. Favourable outcomes will allow the Company to advance the project to a Definitive Feasibility Study.

Key focuses for the Company are minimising environmental impacts, identifying and mitigating process and project risks at an early stage, developing a clear pathway to a timely design and to build a world class, long-life vanadium operation.

Development Manager, Todd Richardson, has been appointed as a permanent member of the AVL team to lead the PFS, subsequent DFS and development of Gabanintha. Todd's significant vanadium expertise and measured approach to project management, is another pivotal step-up for the AVL team. This appointment will also provide continuity as we move through the PFS stages into the DFS. Technical understanding and key relationships being fostered now will be crucial to the project's success.

The Company has also added further vanadium technical experience to the team by appointing Michael Woolery as a consultant to the Company on an 'as needed' basis. Michael has many years of vanadium operations' experience, including Australia and the USA. He has worked for global vanadium companies including Evraz Stratcor.

## VSUN ENERGY

AVL announced on 4<sup>th</sup> April 2018, that its energy focused subsidiary VSUN Energy had submitted a registration of interest to Western Power for its Stand-alone Power Systems (SPS) project. Since this announcement, VSUN Energy has submitted an Expression of Interest to Western Power for the project, with successful respondents progressing to the Request for Tender phase in the coming weeks.

SPS are hybrid systems which are not physically connected to the existing network. The systems use a combination of renewable energy, batteries and back-up diesel generators, enabling generation, storage and reliable delivery of power. They are particularly useful in areas on the fringe of the existing grid where power is not as stable, or in remote, off-grid locations.

VSUN has been successfully operating a stand-alone power system using a 3-phase Cellcube 10kw-100kwh Vanadium Redox Flow Battery continuously without interruption since October 2016. In that time the tree nursery site at Busselton has not used any grid power or alternative fuel and has been 100% powered by solar energy.

VSUN Energy has appointed Murdoch University graduate Paul Donovan to undertake energy data modelling and sales assistance for the company. His Graduate Diploma in Energy and Carbon Studies builds on a foundation in the environmental field, which provide another useful skill set for AVL. Paul has quickly learnt about the strengths and weaknesses of the vanadium redox flow battery and how to use the software required to model the data. He provided assistance at the Energy and Mines Summit and with tender response preparation and the Company is pleased to welcome him to the team.

## **CORPORATE**

### **Marketing**

Mastermines mining materials promotion and marketing consultancy continues to successfully promote AVL in China and the wider Asian markets.

Vanadium Prices have been trending steadily upwards since November 2015 and recently achieved 10 year high prices in over \$19/lb  $V_2O_5$ .

The Company presented at the CIO Mining Australia Summit in Perth. AVL and VSUN Energy had panel representatives at the Energy and Mines Summit, also in Perth. VSUN Energy also sponsored the event and had a booth with information about vanadium in energy storage and the Company's working model VRFB.

Managing Director, Vincent Algar, visited China and Hong Kong, meeting with companies in the VRFB market, steel market and with financial contacts.

The Western Australian government is looking at how the State can benefit from and help the battery metals' industry to develop. Vincent has been invited to be part of the Lithium and Energy Materials Industry Consortium which will meet to discuss ways in which the government can support the mining industry in this globally significant sector.

### **Capital Raising**

During the quarter the Company received a total of \$28,758 through the exercise of 1,437,935 listed options (expiring December 31, 2018) at 2.0 cents per share.

### **Cash Position**

As at the 30<sup>th</sup> June 2018, the Company had \$5.16 million in cash and cash equivalents.

For further information, please contact:

**Vincent Algar, Managing Director**

## About Australian Vanadium Limited

AVL is a diversified resource company with an integrated strategy with respect to vanadium, seeking to offer investors a unique exposure to all aspects of the vanadium value chain – from resource through to steel and energy storage opportunities.

AVL is advancing the development of its 100%-owned, world-class Gabanintha vanadium project. The Gabanintha vanadium project is currently one of the highest-grade vanadium projects being advanced globally with existing Mineral Resource of 175.5Mt at 0.77% vanadium pentoxide ( $V_2O_5$ ), made up of a Measured Mineral Resource of 10.1Mt at 1.11%  $V_2O_5$ , an Indicated Mineral Resource of 24Mt at 0.63%  $V_2O_5$ , and an Inferred Mineral Resource of 141.4Mt at 0.77%  $V_2O_5$ , reported in compliance with the JORC Code 2012 (see AVL ASX Announcement 5<sup>th</sup> July 2018).

The Mineral Resource includes a distinct massive magnetite high-grade zone of 93.6 Mt at 1.00%  $V_2O_5$  consisting of Measured Mineral Resource of 10.1Mt at 1.11%  $V_2O_5$ , Indicated Mineral Resource of 4.9Mt at 1.09%  $V_2O_5$ , and Inferred Mineral Resource of 78.6Mt at 0.98%  $V_2O_5$ .

AVL is aiming to develop a local commercial production capacity for high-purity vanadium electrolyte, which forms a key component of vanadium redox flow batteries (VRFB). AVL, through its 100%-owned subsidiary VSUN Energy Pty Ltd, is also actively marketing VRFB in Australia.

## Tenement Schedule

Tenement Information as Required by Listing Rule 5.3.3 For the Quarter Ended 30 June 2018					
Project	Location	Tenements	Economic Interest	Notes	Change in Quarter %
Western Australia	Gabanintha	E51/843	100% Granted <sup>1</sup>		Nil
		E51/1396	100% Granted <sup>1</sup>		Nil
		E51/1534	100% Granted <sup>1</sup>		Nil
		E51/1576	100% Granted <sup>1</sup>		Nil
		E51/1685	100% Granted <sup>1</sup>		Nil
		E51/1694	100% Granted <sup>1</sup>		Nil
		E51/1695	100% Granted <sup>1</sup>		Nil
		P51/2566	100% Granted <sup>1</sup>		Nil
		P51/2567	100% Granted <sup>1</sup>		Nil
		P51/2634	100% Granted <sup>1</sup>		Nil
		P51/2635	100% Granted <sup>1</sup>		Nil
		P51/2636	100% Granted <sup>1</sup>		Nil
		MLA51/878		100% On application	Nil
Western Australia	Nowthanna	M51/771	100% Granted		Nil
Western Australia	Peak Hill	E52/3349	0.75% NSR Production Royalty		Nil
Western Australia	Coates	E70-4924-I	100% Granted		Nil
South Africa	Blesberg	(NC) 940 PR		Earning 50.03%	Nil

Note 1: Australian Vanadium Limited retains 100% rights in V/U/Co/Cr/Ti/Li/Ta/Mn & iron ore on the Gabanintha Project. Bryah Resources Limited holds the Mineral Rights for all minerals except V/U/Co/Cr/Ti/Li/Ta/Mn & iron ore only.



## Competent Person Statements – Gabanintha Project

*The information in this report that relates to Exploration Results and Exploration Targets is based on and fairly represents information and supporting documentation prepared by Mr Brian Davis (Consultant with Geologica Pty Ltd). Mr Davis is a shareholder of Australian Vanadium Limited. Mr Davis is a member of the Australian Institute of Geoscientists and has sufficient experience of relevance to the styles of mineralisation and types of deposits under consideration, and to the activities undertaken to qualify as a Competent Person as defined in the 2012 Edition of the Joint Ore Reserves Committee (JORC) Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Specifically, Mr Davis consents to the inclusion in this report of the matters based on his information in the form and context in which they appear.*

*The information in this report that relates to Mineral Resources is based on and fairly represents information compiled by Mr Lauritz Barnes, (Consultant with Trepanier Pty Ltd) and Mr Brian Davis (Consultant with Geologica Pty Ltd). Mr Davis is a shareholder of Australian Vanadium Limited. Mr Barnes and Mr Davis are members of the Australasian Institute of Mining and Metallurgy and both have sufficient experience of relevance to the styles of mineralisation and types of deposits under consideration, and to the activities undertaken to qualify as Competent Persons as defined in the 2012 Edition of the Joint Ore Reserves Committee (JORC) Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Specifically, Mr Barnes is the Competent Person for the estimation and Mr Davis is the Competent Person for the database, geological model and site visits. Mr Barnes and Mr Davis consent to the inclusion in this report of the matters based on their information in the form and context in which they appear.*

*The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and, in the case of estimates of Mineral Resource or Ore Reserves, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. The company confirms that the form and context in which the competent person's findings are presented has not been materially modified from the original market announcement.*

## Competent Person Statement – Blesberg Exploration Program

*The information relating to the Blesberg Feldspar-Lithium-Tantalum Project exploration program reported in this announcement is based on information compiled by Mr Vincent Algar. Mr Algar is a Member of The Australian Institute of Mining and Metallurgy (AusIMM) and a full-time employee of the Company. Mr Algar has more than 25 years' experience in the field of mineral exploration. He has sufficient experience relevant to the style of mineralisation and type of deposit under consideration 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. Algar consents to the inclusion in the report of the matters based on the information made available to him, in the form and context in which it appears.*

## Competent Person Statement – Metallurgical Results

*The information in this statement that relates to Metallurgical Results is based on information compiled by independent consulting metallurgist Brian McNab (CP. B.Sc Extractive Metallurgy), Mr McNab is a Member of The Australasian Institute of Mining and Metallurgy. Brian McNab is employed by Wood Mining and Metals. Mr McNab has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which is undertaken, 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 McNab consents to the inclusion in the report of the matters based on the information made available to him, in the form and context in which it appears.*

## Forward Looking Statements

*This announcement may contain certain "forward-looking statements" which may not have been based solely on historical facts, but rather may be based on the Company's current expectations about future events and results. Where the Company expresses or implies an expectation or belief as to future events or results, such expectation or belief is expressed in good faith and believed to have a reasonable basis. However, forward looking statements are subject to risks, uncertainties, assumptions and other factors which could cause actual results to differ materially from future results expressed, projected or implied by such forward-looking statements. Such risks include, but are not limited to Resource risk, metal price volatility, currency fluctuations, increased production costs and variances in ore grade or recovery rates from those assumed in mining plans, as well as political and operational risks in the countries and states in which we sell our product to, and government regulation and judicial outcomes. For more detailed discussion of such risks and other factors, see the Company's Annual Reports, as well as the Company's other filings. Readers should not place undue reliance on forward looking information. The Company does not undertake any obligation to release publicly any revisions to any "forward looking statement" to reflect events or circumstances after the date of this announcement, or to reflect the occurrence of unanticipated events, except as may be required under applicable securities laws.*