ASX Announcement

Highly Successful Drilling Program Completed at the Australian Vanadium Project

Completion of large-scale sample collection allows acceleration of final process test work, resource update and upward revision of project economics

Highlights:

- **Metallurgical and resource drilling has concluded ahead of schedule**
- **Tightly controlled drilling program has collected over 30 tonnes of massive magnetite for further processing, utilising 2,862m of drilled core from 30 drillholes**
- **Drilling has confirmed geological model, proved depth extension and deposit thickness, supporting further resource upgrades**
- **Extensive drilling indicates shallow weathering and potential for improved magnetic recovery, directly improving project economics**
- **Program focused on development area in northern 2km of total 11.5km of AVL held deposit strike**
- **18 new drillholes successfully targeted resource depth extensions**
- **Pilot scale* metallurgical test program underway to confirm details of processing circuit for final DFS design**
- **Mineral Resource upgrade to follow**
- **Hydrology drilling, other DFS engineering and environmental approval support work ongoing**
- **Project timeline targeting 2021 production, subject to finance partner selection**
- **Company's flagship project, the Australian Vanadium Project (formerly Gabanintha) renamed for clarity with stakeholders, prospective partners and investors**

***Pilot Scale is a test program that allows simulation of typical processing of ore and should be at least at a scale of tonnes of ore per hour in a continuous process test, identical in as many ways as possible to the final built process. All inputs and outputs are measured and managed for analysis and if required, refinement in the final design to be built. Most successful projects complete properly scaled pilot studies, many failed projects do not.**

4 April 2019

ASX ANNOUNCEMENT

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Projects:

The Australian Vanadium Project - Vanadium
Blesberg,South Africa - Lithium/Tantalum
Nowthanna Hill – Uranium/Vanadium
Coates - Vanadium

Australian Vanadium Limited (ASX: AVL, “the Company” or AVL”) is pleased to report on the completion of metallurgical and resource drilling at the Australian Vanadium Project near Meekatharra in Western Australia (see Figure 4).

The completed drill program collected large diameter diamond (PQ size) core test material for pilot scale studies by targeting blends of material types that will be typical of material to be mined from the high-grade massive magnetite layer within the proposed open pit at the Australian Vanadium Project. (See ASX announcement dated 19 December 2018 ‘*Gabanintha Pre-Feasibility Study and Maiden Ore Reserve*’)

Detailed pilot scale test work has now commenced ahead of schedule for the finalisation of the processing flow diagram (PFD) ahead of final engineering design. The pilot program will test representative amounts of ore to ensure that the process is scaled up correctly for actual mine production. The large tonnage sample collected by the Company will allow for a scaled pilot program and is industry best practice for a project this size.

“Testing 30 tonnes of our target magnetite blend is necessary for a project like AVL’s. The data collected from this pilot program will de-risk the final design and assure investors that the project will achieve production and quality targets. Projects of this scale must be designed and built with high confidence in the outcome and this can only be attained by a well-managed pilot program. AVL’s world class team has all the experience in vanadium to know what to look for, and we will achieve the best possible process by thorough and efficient evaluation”,

“Time is very much of the essence, speed and accuracy are the way things will be done to achieve the goal of bringing this world class asset to production”, commented Managing Director Vincent Algar.

2019 Pilot Plant Drill Campaign

Collection of large diameter diamond core (PQ size) as test material for pilot scale studies has now been completed. Diamond core of all material types in the high-grade massive magnetite layer was drilled using downdip and vertical diamond drill holes. The drilling was completed within AVL’s proposed open pit at the Australian Vanadium Project, located 40 km south of Meekatharra.

Plate 1 - Diamond drill rig on site at the Australian Vanadium Project

Managing Director Vincent Algar further comments, “The globally unique substantial thickness of our Vanadium Titanium Magnetite (VTM) deposit has allowed the Company to advance collection of material for the Pilot Study by carefully planned and successfully executed downdip drilling. The time and cost savings gained by using this method match our accelerated time line to achieving production in 2021. We have learned a significant amount more about our amazing deposit by this well executed drill program. The complex, but predictable nature of the material types, weathering and mafic/magnetite ratios are all crucial for the final mine plan. One key discovery is the presence of less weathered, highly magnetic material at surface within our designed pit length. This finding will have a significant impact on our capex and opex costs, and consequently drive up our project NPV (value)”

23 tonnes of drill core have already been delivered to an experienced laboratory in Perth, with the remainder (7 tonnes) to be delivered in early April.

At completion, the drill program has provided AVL with:

- Over 30 tonnes of oxide, transitional and fresh core samples required to run a robust pilot plant testwork program for the Crushing, Milling and Beneficiation (CMB) circuit;
- Concentrate products from the CMB pilot plant testwork program for use in a continuous hydrometallurgical pilot including salt-roast leach that will produce samples of refined vanadium pentoxide (V_2O_5); and
- Information from these tests to be used to further refine the results of the Pre-Feasibility Study (PFS) released in December 2018.
- Significantly improved definition of oxidation boundaries. Drilling has indicated a region of the current pit design that is much less oxidised than originally estimated in the PFS. This increased volume of magnetically responsive material (transition ore), will improve the mine schedule by increasing overall mass yield, and decrease LOM capital (pre-strip) and opex.
- 18 additional deep intersections and associated assay information will be used to complete a revised Mineral Resource Estimate, targeting extensions to the resources below the current pit design where the deposit remains open at depth.

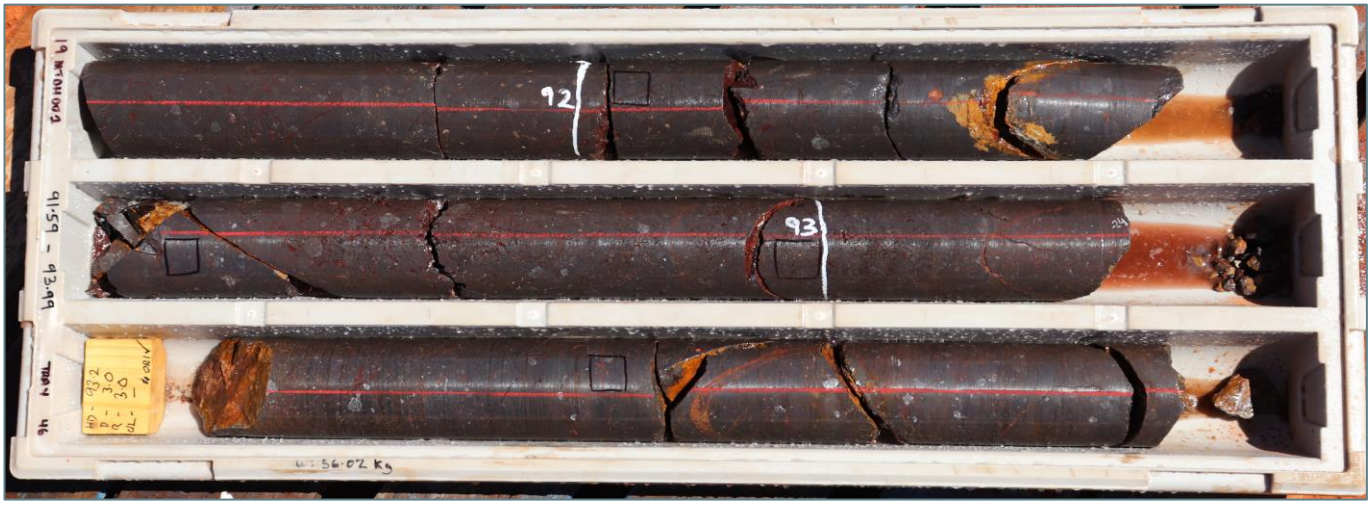

Plate 2 - Massive Magnetite in Diamond drill core from 19MTDH001 on site at the Australian Vanadium Project

Focused campaign

The drill program was completed in late March 2019, ahead of schedule.

The completed drilling campaign focused only on the northern 2km of AVL's 11.5km held deposit strike length with drill core collected along the length and depth of the current pit defined by the PFS (see Figure 4). AVL can significantly increase the resource base at the Project by further drilling southwards along its 100% owned large, dominant ground position in the area.

The robust analysis of large volumes of typical material from within the existing Ore Reserve aims to distinguish AVL as the leading vanadium project of choice globally.

A total of 30 large diameter diamond core holes, 12 downdip and 18 vertical holes, have been completed for a total of 4,823 metres during the program. Table 1 shows the drill collars and orientations of the completed drillholes. Of this, 2,862 metres of mineralised core samples collected are being prepared for assay analysis. Detailed calibrated handheld XRF measurements and portable Magnetic Susceptibility (MagSus) measurements have already been collected every 50cm along this core (see Plate 2). Downhole MagSus at 10cm resolution for detailed interpretation was also completed where holes remained open in mineralisation at depth.

For example, Hole 19MTDH006 was drilled down dip into the massive magnetite horizon and was terminated at 230m depth, still within the magnetite horizon (see Figures 2 and 3). This hole confirms the highly consistent nature of the Australian Vanadium Project massive magnetite horizon as well as confirming the accuracy of the current resource model.

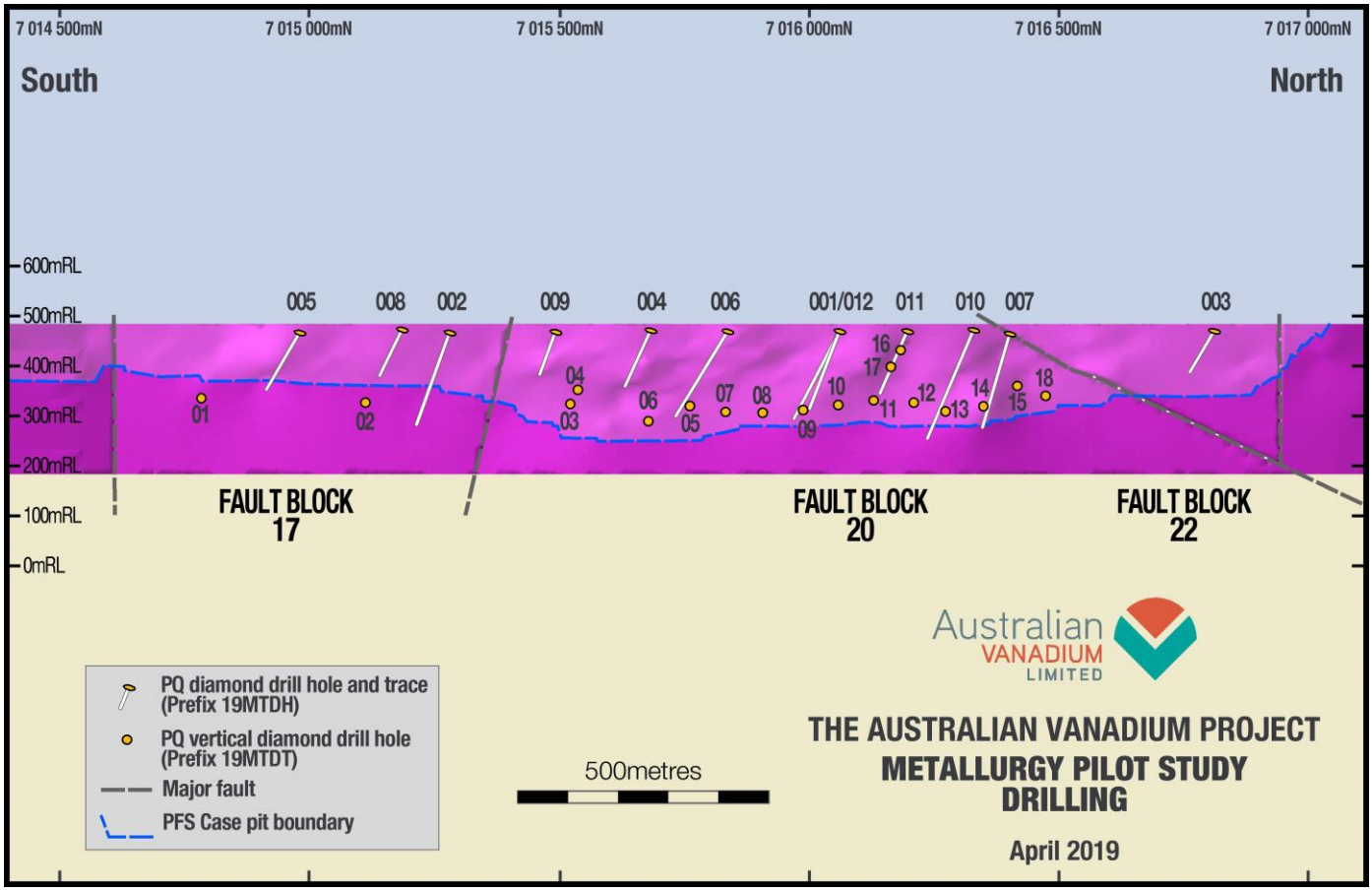

Figure 2 -Schematic Long Section of the 2019 metallurgical diamond drilling program.

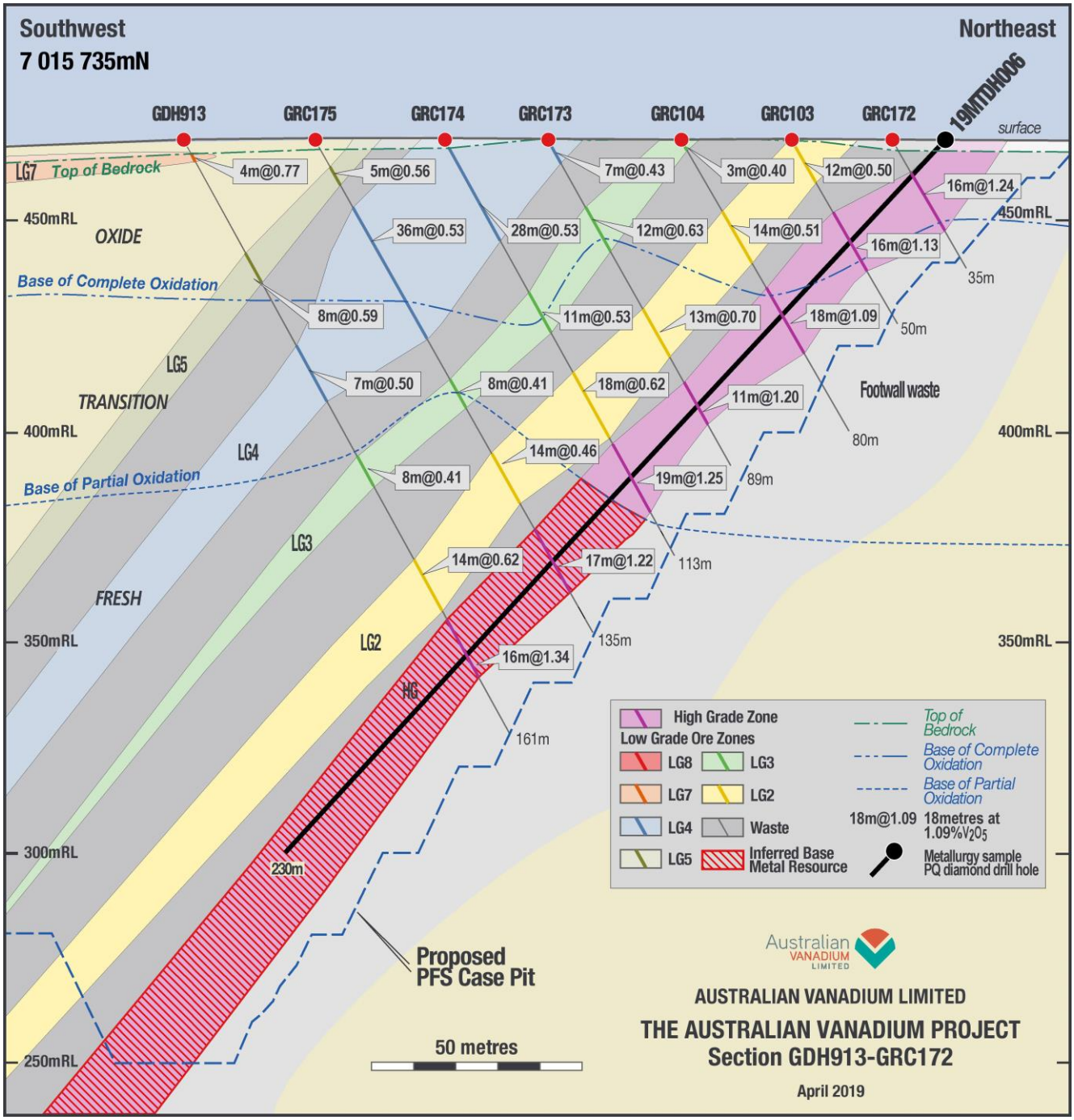

Figure 3 -Schematic Cross Section of hole 19MTDH006 showing hole's location inside the massive magnetite target zone. Lithologies intersected include 166m of massive magnetite with 60m of minor mafic bands.

The Australian Vanadium Project - Path forward

With the successful collection of the core for the Pilot Study, the Australian Vanadium Project is on schedule for completion of the Pilot Study and Definitive Feasibility Study (DFS) in 2019. The Company plans to then proceed into Front End Engineering Design (FEED) and aims to commence construction in 2020 followed by start-up in 2021.

The Pilot Study is split into the CMB pilot (crushing, milling and beneficiation using magnetic separation), and Refining pilot (Roast Leach and vanadium precipitation). The CMB pilot has commenced. Prior to the Refinery pilot commencing, AVL's expert vanadium team is conducting ground breaking value-adding test work to refine the conditions for the upcoming tests.

The team has identified some key areas of improvement that can further improve the Project's excellent economics. These improvements are in the areas of grind size, roast temperature and time, as well as reagent addition rates. Results will be confirmed prior to the Refinery pilot commencement and incorporated into a planned update to the PFS metrics later in 2019.

Follow-up hydrology drilling is planned to commence in the coming days with the drill rig already mobilised to site. Submission of a detailed environmental impact report for the Project will occur upon completion of the hydrology and other required study work, to allow full assessment by the regulators later in 2019.

The Company is active in the vanadium and financial markets, presenting the unique geological and technical merits of the project to prospective partners and investors. The Project is being very well received and the Company is confident that a prospective investment partner will be found to join with AVL in the development of the Project.

As the Company is marketing the project to prospective partners and investors largely outside of Australia, the Company has decided to rename the project, formerly known as the Gabanintha Project, as the Australian Vanadium Project to clearly highlight the attractive investment jurisdiction within which the project is located.

For further information, please contact:

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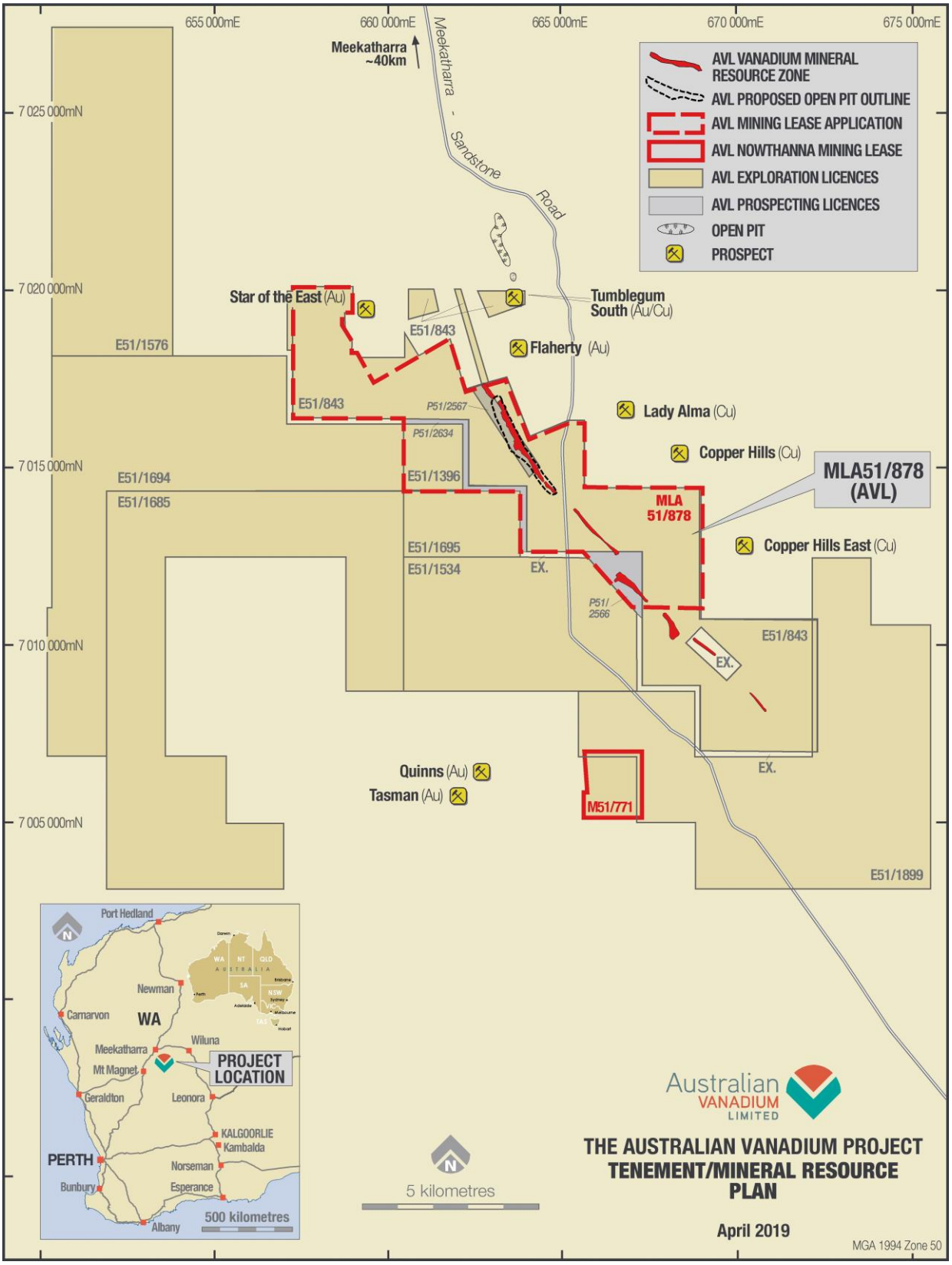

Figure 4 - Location Diagram of the Australian Vanadium Project

Table 1 Drillhole Collar Table

Hole ID	MGA94 East	MGA94 North	RL(m)	Precollar Depth (m)	Depth (m)	Dip	Azimuth
19MTDH001	663567	7016061	467.5	-	188.55	-55^{O}	233.3^{O}
19MTDH002	663996	7015280	465.6	-	211.9	-62^{O}	230.5^{O}
19MTDH003	663217	7016809	467.3	-	108.2	-50^{O}	230.0^{O}
19MTDH004	663760	7015685	468.2	-	135.0	-55^{O}	230.0^{O}
19MTDH005	664209	7014980	463.7	-	147.0	-49.5^{O}	229.1^{O}
19MTDH006	663689	7015838	467.7	-	230.0	-48^{O}	230.0^{O}
19MTDH007	663350	7016401	464.9	-	207.4	-65^{O}	231.8^{O}
19MTDH008	664076	7015183	468.4	-	111.0	-55^{O}	228.9^{O}
19MTDH009	663217	7016809	467.3	-	96.3	-50^{O}	228.6^{O}
19MTDH010	663418.7	7016328.1	466.0	-	261.3	-55^{O}	230.0^{O}
19MTDH011	663488	7016186.4	466.1	-	129.3	-55^{O}	230.0^{O}
19MTDH012	663570	7016060	467.5	-	222.3	-51^{O}	230.0^{O}
19MTDT001	664219.1	7014782.2	462.8	102	141.4	-90^{O}	0^{O}
19MTDT002	664011.5	7015111.5	465.8	124	170	-90^{O}	0^{O}
19MTDT003	663706.4	7015517.8	470.7	101	157.8	-90^{O}	0^{O}
19MTDT004	663728.7	7015536.3	468.9	94	171.3	-90^{O}	0^{O}
19MTDT005	663556	7015755	469.0	140	181.9	-90^{O}	0^{O}
19MTDT006	663587.3	7015677.3	467.4	166	195.5	-90^{O}	0^{O}
19MTDT007	663527.2	7015832.7	467.8	154	182	-90^{O}	0^{O}
19MTDT008	663502.5	7015908.9	468.4	142	211.2	-90^{O}	0^{O}
19MTDT009	663467.2	7015987.1	468.0	128	181.8	-90^{O}	0^{O}
19MTDT010	663438	7016059	467.0	117	155.1	-90^{O}	0^{O}
19MTDT011	663394	7016126	466.0	114	145.9	-90^{O}	0^{O}
19MTDT012	663360.4	7016202.8	466.0	118	148.4	-90^{O}	0^{O}
19MTDT013	663331	7016272	467.0	106	175.9	-90^{O}	0^{O}
19MTDT014	663301.4	7016349.6	466.4	120	165.7	-90^{O}	0^{O}
19MTDT015	663264.4	7016416.9	465.8	85	115.9	-90^{O}	0^{O}
19MTDT016	663464	7016181.7	465.6	20	54.8	-90^{O}	0^{O}
19MTDT017	663441.1	7016162.4	465.6	60	81.1	-90^{O}	0^{O}
19MTDT018	663211.2	7016472.3	467.6	70	139.6	-90^{O}	0^{O}
Total Diamond Drill meters					**2862.55**		
Total Reverse Circulation meters					**1961.00**		
Total Drilled meters					**4823.55**		

Table 2 – The Australian Vanadium Project – Mineral Resource estimate at November 2018 by domain and resource classification using a nominal 0.4% V_2O_5 wireframed cut-off for low grade and nominal 0.7% V_2O_5 wireframed cut-off for high grade (total numbers may not add up due to rounding)

Zone	Classification	Mt	V_2O_5 %	Fe %	TiO_2 %	SiO_2 %	Al_2O_3 %	LOI %
HG 10	Measured	10.2	1.11	42.7	12.6	10.2	8.0	3.9
	Indicated	12.1	1.05	43.8	11.9	10.6	7.6	3.5
	Inferred	74.5	0.97	42.1	11.2	11.6	7.6	3.4
	Sub-total	**96.7**	**1.00**	**42.4**	**11.4**	**11.3**	**7.7**	**3.5**
LG 2-5	Measured	-	-	-	-	-	-	-
	Indicated	28.6	0.50	24.6	6.9	27.5	17.9	8.6
	Inferred	53.9	0.49	25.3	6.7	27.5	16.4	7.3
	Sub-total	**82.5**	**0.49**	**25.1**	**6.8**	**27.5**	**16.9**	**7.7**
Transported 6-8	Measured	-	-	-	-	-	-	-
	Indicated	-	-	-	-	-	-	-
	Inferred	4.4	0.65	28.2	7.2	24.7	16.7	8.5
	Sub-total	**4.4**	**0.65**	**28.2**	**7.2**	**24.7**	**16.7**	**8.5**
Total	Measured	10.2	1.11	42.7	12.6	10.2	8.0	3.9
	Indicated	40.7	0.66	30.3	8.3	22.5	14.8	7.1
	Inferred	132.7	0.77	34.8	9.2	18.5	11.5	5.1
	Sub-total	**183.6**	**0.76**	**34.3**	**9.2**	**18.9**	**12.1**	**5.5**

Table 3 - Ore Reserve Statement as at November 2018, at a cut-off grade of 0.8% V_2O_5

Reserve classification	t	V_2O_5 %	Co ppm	Ni ppm	Cu ppm	S %	SiO_2 %	Fe_2O_3 %	V_2O_5 produced t
Proved	9, 820 ,000	1.07	172	571	230	0.06	9.47	58.7	65,000
Probable	8 ,420, 000	1.01	175	628	212	0.08	10.07	59.5	56,000
Total	**18, 240, 000**	**1.04**	**173**	**597**	**222**	**0.07**	**9.75**	**59.1**	**121,000**

Competent Person Statement – Exploration Results and Exploration Targets

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 Australasian Institute of Mining and Metallurgy 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 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 Davis consents to the inclusion in this report of the matters based on his information in the form and context in which they appear.

Competent Person Statement — Mineral Resource Estimation

The information in this announcement 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 (AusIMM) and Mr Davis is a member of the Australian Institute of Geoscientists, 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 announcement of the matters based on their information in the form and context in which they appear.

Competent Person Statement — Ore Reserves

The scientific and technical information in this announcement that relates to ore reserves estimates for the Project is based on information compiled by Mr Roselt Croeser, an independent consultant to AVL. Mr Croeser is a member of AusIMM. Mr Croeser has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a competent person

as defined in the JORC 2012 Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Croeser consents to the inclusion in the announcement of the matters related to the ore reserve estimate in the form and context in which it appears.

Competent Person Statement – Metallurgical Results

The information in this announcement 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 AusIMM. 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 JORC 2012 Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr McNab consents to the inclusion in the announcement of the matters based on the information made available to him, in the form and context in which it appears.

Appendix 1 – JORC Code Table 1

2019 Drilling Progress Update with latest Mineral Resource Estimate dated November 2018 (2012 JORC Code – Table 1)

Section 1: Sampling Techniques and Data

Criteria	JORC Code Explanation	Commentary
Sampling techniques	Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.	The Australian Vanadium Project deposit was sampled using diamond core and reverse circulation (RC) percussion drilling from surface. During 2019 a further 30 PQ diamond drill holes have been completed to collect metallurgy sample for a plant pilot study. 12 are drilled down-dip of the high-grade zone. These were complimented by an additional 18 PQ diamond drill tails on RC pre-collars, drilling vertically. These holes are measured by hand-held XRF at 50 cm intervals to inform metallurgy characterisation but will not form part of any resource estimation update unless certified laboratory analysis is completed on a cut portion of the drill core. At the time of the latest Mineral Resource estimation (November 2018), a total of 250 RC holes and 20 diamond holes (6 of which are diamond tails) were drilled into the deposit. 59 of the 251 holes were either too far north or east of the main mineralisation trend or excised due to being on another tenancy. One section in the southern part of the deposit (holes GRC0156, GRC0074, GRC0037 and GRC0038) was blocked out and excluded from the resource due to what appeared to be an intrusion which affected the mineralised zones in this area. Of the remaining 191 drillholes, one had geological logging, but no assays and one was excluded due to poor sample return causing poor representation of the mineralised zones. Two diamond holes drilled during 2018 were not part of the resource estimate, as they were drilled into the western wall for geotechnical purposes. The total metres of drilling available for use in the interpretation and grade estimation was 17,530m at the date of the most recent resource estimate. The initial 17 RC drillholes were drilled by Intermin Resources NL (IRC) in 1998. These holes were not used in the 2015 and 2017 estimates due to very long unequal sample lengths and a different grade profile from subsequent drilling. 31 RC drillholes were drilled by Greater Pacific NL in 2000 and the remaining holes for the project were drilled by Australian Vanadium Ltd (Previously Yellow Rock Resources Ltd) between 2007 and 2018. This drilling includes 20 diamond holes (6 of which are diamond tails) and 76 RC holes, for a total of 20,974m drilled. All of the drilling sampled both high and low-grade material and were sampled for assaying of a typical iron ore suite, including vanadium and titanium plus base metals and sulphur.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	2019 PQ core has not been sampled. Handheld XRF machines being used to take ½ metre measurements on the core have been calibrated using pulps from previous drilling by the Company, for which there are known head assays. 2018 HQ diamond core was half-core sampled at regular intervals (usually one metre) with smaller sample intervals at geological boundaries. 2015 diamond core was quarter-core sampled at regular intervals (usually one metre) and constrained to geological boundaries where appropriate. 2009 HQ diamond core was half-core sampled at regular intervals (one metre) or to geological boundaries. Most of the RC drilling was sampled at one metre intervals, apart from the very earliest programme in 1998. RC samples have been split from the rig for all programs with a cone splitter to obtain 2.5 – 3.5 kg of sample from each metre. Field duplicates were collected for every 40th drill metre to check sample representativity from the drill rig splitter.

Criteria	JORC Code Explanation	Commentary
	Aspects of the determination of mineralisation that are Material to the Public Report.	RC drilling samples were collected at one metre intervals and passed through a cone splitter to obtain a nominal 2-5kg sample at an approximate 10% split ratio. These split samples were collected in pre-numbered calico sample bags. The sample was dried, crushed and pulverised to produce a sub sample (~200g) for laboratory analysis using XRF and total LOI by thermo-gravimetric analysis. Diamond core was drilled predominantly at HQ size for the earlier drilling (2009) and entirely HQ for the 2018 program, with the 2015 and 2019 drilling at PQ3 size. Field duplicates, standards and blanks have been inserted into the sampling stream at a rate of nominally 1:20 for blanks, 1:20 for standards (including internal laboratory), 1:40 for field duplicates, 1:20 for laboratory checks and 1:74 for umpire assays.
Drilling techniques	Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face- sampling bit or other type, whether core is oriented and if so, by what method, etc.).	Diamond drillholes account for 14% of the drill metres used in the Resource Estimate and comprises HQ and PQ3 sized core. RC drilling (generally 135 mm to 140 mm face-sampling hammer) accounts for the remaining 86% of the drilled metres. Six of the diamond holes have RC pre-collars (GDH911, GDH913 & GDH916, 18GEDH001, 002 and 003), otherwise all holes are drilled from surface. No core orientation data has been recorded in the database. 17 RC holes were drilled during the 2018 program and three HQ diamond tails were drilled on RC pre-collars for resource and geotechnical purposes. The core was not orientated but all diamond holes were logged by OTV and ATV televiewer. Six RC holes from the 2018 campaign are not used in the resource estimate due to results pending at the time of the latest update, and two diamond holes drilled during 2018 were not used as they are for geotechnical purposes and do not intersect the mineralised zones. During 2019 a further 12 PQ diamond holes have been drilled down-dip on the high-grade zone for metallurgical sample, but have not been sampled for assay analysis, and do not form part of any resource estimation. An addition 18 PQ diamond tails on RC pre-collars have been drilled vertically and are expected to contribute to the resource.
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed.	Diamond core recovery is measured when the core is recovered from the drill string. The length of core in the tray is compared with the expected drilled length and is recorded in the database. For the 2019, 2018 and 2015 drilling, RC chip sample recovery was gauged by how much of the sample was returned from the cone splitter. This was recorded as good, fair, poor or no sample. The older drilling programmes used a different splitter, but still compared and recorded how much sample was returned for the drilled intervals. All of the RC sample bags (non-split portion) from the 2018 programme were weighed as an additional check on recovery. An experienced AVL geologist was present during drilling and any issues noticed were immediately rectified. No significant sample recovery issues were encountered in the RC or PQ drilling in 2019.
	Measures taken to maximize sample recovery and ensure representative nature of the samples.	Core depths are checked against the depth given on the core blocks and rod counts are routinely carried out by the drillers. Recovered core was measured and compared against driller's blocks. RC chip samples were actively monitored by the geologist whilst drilling. All drillholes are collared with PVC pipe for the first metres, to ensure the hole stays open and clean from debris.

Criteria	JORC Code Explanation	Commentary
	Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.	No relationship between sample recovery and grade has been demonstrated. Two shallow diamond drillholes drilled to twin RC holes have been completed to assess sample bias due to preferential loss/gain of fine/coarse material. Geologica Pty Ltd is satisfied that the RC holes have taken a sufficiently representative sample of the mineralisation and minimal loss of fines has occurred in the RC drilling resulting in minimal sample bias.
Logging	Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.	All diamond core and RC chips from holes included in the latest resource estimate were geologically logged. Diamond core was geologically logged using predefined lithological, mineralogical and physical characteristics (such as colour, weathering, fabric, texture) logging codes and the logged intervals were based on lithological intervals. RQD and recoveries were also recorded. Minimal structural measurements were recorded (bedding to core angle measurements) but have not yet been saved to the database. The logging was completed on site by the responsible geologist. All of the drilling was logged onto paper and was transferred to a SQL Server drillhole database using DataShedTM database management software. The database is managed by Mitchell River Group (MRG). The data was checked for accuracy when transferred to ensure that correct information was recorded. Any discrepancies were referred back to field personnel for checking and editing. All core trays were photographed wet and dry. RC chips were logged generally on metre intervals, with the abundance/proportions of specific minerals, material types, lithologies, weathering and colour recorded. Physical hardness for RC holes is estimated by chip recovery and properties (friability, angularity) and in diamond holes by scratch testing. From 2015, drilling also had magnetic susceptibility recorded, with the first nine diamond holes (GDH901-GDH909) having readings taken on the core every 30 cm or so downhole. Holes GDH910 to GDH917 had readings every 50 cm and RC holes GRC0159 to GRC0221 had readings for every one metre green sample bag. 2018 RC drill holes also have magnetic susceptibility data for each one metre of drilling. All resource (vs geotechnical) diamond core and RC samples have been logged to a level of detail to support Mineral Resource estimation to and classification to Measured Mineral Resource at best. Geotechnical logging and OTV/ATV data was collected on three diamond drillholes from the 2018 campaign, by consultant company Dempers and Seymour, adding to an existing dataset of geotechnical logging on 8 of the 2015 diamond drillholes and televiewer data for four of the same drillholes. In addition, during 2018 televiewer data was collected on a further 15 RC drillholes from various drill campaigns at the project. PQ diamond drill holes completed during 2019 have handheld XRF readings per half metre, in addition to KT-10 magnetic susceptibility readings at the same core locations. They are being geologically and geotechnically logged in detail by the site geologists.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	Logging was both qualitative and quantitative in nature, with general lithology information recorded as qualitative and most mineralisation records and geotechnical records being quantitative. Core photos were collected for all diamond drilling.
	The total length and percentage of the relevant intersections logged.	All recovered intervals were geologically logged.

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Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken.	The 2018 and 2009 HQ diamond core was cut in half and the half core samples were sent to the laboratories for assaying. Sample intervals were marked on the core by the responsible geologist considering lithological and structural features. No core was selected for duplicate analysis. The 2015 PQ diamond core was cut in half and then the right-hand side of the core (facing downhole) was halved again using a powered core saw. Quarter core samples were sent to the laboratories for assaying. Sample intervals were marked on the core by the responsible geologist considering lithological and structural features. No core was selected for duplicate analysis. 20-30% of the total PQ diamond drill holes from 2019 will be sampled, through cutting a wedge from the core. This sample will be available for assay analysis. The portions of core to be sampled are still to be selected.
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	RC drilling was sampled by use of an automatic cone splitter for the 2018 and 2015 drilling programmes; drilling was generally dry with a few damp samples. Older drilling programmes employed riffle splitters to produce the required sample splits for assaying. One in 40 to 50 RC samples was resampled as field duplicates for QAQC assaying.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	The sample preparation techniques employed for the diamond core samples follow standard industry best practice. All samples were crushed by jaw and Boyd crushers and split if required to produce a standardised ~3kg sample for pulverising. The 2015 programme RC chips were split to produce the same sized sample. All samples were pulverised to a nominal 90% passing 75 micron sizing and sub sampled for assaying and LOI determination tests. The remaining pulps are stored at an AVL facility. The sample preparation techniques are of industry standard and are appropriate for the sample types and proposed assaying methods.
	Quality control procedures adopted for all sub-sampling stages to maximize representivity of samples.	Field duplicates, standards and blanks have been inserted into the sampling stream at a rate of nominally 1:20 for blanks, 1:20 for standards (including internal laboratory), 1:40 for field duplicates, 1:20 for laboratory checks and 1:74 for umpire assays. Also, for the recent sampling at BV, 1 in 20 samples were tested to check for pulp grind size.
	Measures taken to ensure that the sampling is representative of the in-situ material collected, including for instance results for field duplicate/second-half sampling.	To ensure the samples collected are representative of the in-situ material, a 140mm diameter RC hammer was used to collect one metre samples and either HQ or PQ3 sized core was taken from the diamond holes. Given that the mineralisation at the Australian Vanadium Project is either massive or disseminated magnetite/martite hosted vanadium, which shows good consistency in interpretation between sections and occurs as percentage values in the samples, Geologica Pty Ltd considers the sample sizes to be representative. Core is not split for duplicates, but RC samples are split at the collection stage to get representative (2-3kg) duplicate samples. The entire core sample and all the RC chips are crushed and /or mixed before splitting to smaller sub-samples for assaying.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	As all of the variables being tested occur as moderate to high percentage values and generally have very low variances (apart from Cr_2O_3), the chosen sample sizes are deemed appropriate.

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Quality of assay data and laboratory tests	The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	All samples for the Australian Vanadium Project were assayed for the full iron ore suite by XRF (24 elements) and for total LOI by thermo-gravimetric technique. The method used is designed to measure the total amount of each element in the sample. Some 2015 RC samples in the oxide profile were also selected for SATMAGAN analysis that is a measure of the amount of total iron that is present as magnetite (or other magnetic iron spinel phases, such as maghemite or kenomagnetite). SATMAGAN analysis was conducted at Bureau Veritas (BV) Laboratory in early 2018. Analysis results of the relevant portions of the RC holes by Satmagan are pending, but underway. Although the laboratories changed over time for different drilling programmes, the laboratory procedures all appear to be in line with industry standards and appropriate for iron ore deposits, and the commercial laboratories have been industry recognized and certified Samples are dried at 105^{o}C in gas fired ovens for 18-24 hours before RC samples being split 50:50. One portion is retained for future testing, while the other is then crushed and pulverised. Sub-samples are collected to produce a 66g sample that is used to produce a fused bead for XRF based analysing and reporting. Certified and non-certified Reference Material standards, field duplicates and umpire laboratory analysis are used for quality control. The standards inserted by AVL during the 2015 drill campaign were designed to test the V_2O_5 grades around 1.94%, 0.95% and 0.47%. The internal laboratory standards used have varied grade ranges but do cover these three grades as well. During 2018, three Certified Reference Materials (CRMs) were used by AVL as field standards. These covered the V_2O_5 grade ranges around 0.327%, 0.790% and 1.233%. These CRMs are also certified for other relevant major element and oxide values, including Fe, TiO_2, Al_2O_3, SiO_2, Co, Ni and Cu (amongst others). Most of the laboratory standards used show an apparent underestimation of V_2O_5, with the results plotting below the expected value lines, however the results generally fall within ± 5-10% ranges of the expected values. The other elements show no obvious material bias. Standards used by AVL generally showed good precision, falling within 3-5% of the mean value in any batch. The standards were not certified but compared with the internal laboratory standards (certified) they appear to show good accuracy as well. Field duplicate results from the 2015 drilling all fall within 10% of their original values. The BV laboratory XRF machine calibrations are checked once per shift using calibration beads made using exact weights and they performed repeat analyses of sample pulps at a rate of 1:20 (5% of all samples). The lab repeats compare very closely with the original analysis for all elements. 2019 PQ diamond core is not yet sampled, but any core sampled will be subject to the same process outlined above for previous drill campaigns.
	For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.	The geophysical readings taken for the Australian Vanadium Project core and RC samples and recorded in the database were magnetic susceptibility. For the 2009 diamond and 2015 RC and diamond drill campaigns this was undertaken using an RT1 hand magnetic susceptibility meter (CorMaGeo/Fugro) with a sensitivity of 1 x 10^{-5} (dimensionless units). The first nine diamond holes (GDH901 – GDH909) were sampled at approximately 0.3m intervals, the last eight (GDH910 – GDH917) at 0.5m intervals and the RC chip bags for every green bagged sample (one metre). During 2018 and 2019 RC and diamond core has been measured using a KT-10 magnetic susceptibility metre, at 1 x 10^{-3} ssi unit. In addition to the handhold magnetic susceptibility described above the 2019 drilling included downhole magnetic susceptibility. This was taken using a Century Geophysical 9622 Magnetic Susceptibility tool. The 9622 downhole tool sensitivity is 20 x 10^{-5} with a resolution of 10cm 2019 diamond core is being analysed using an Olympus Vanta pXRF with a 20 second read time. The unit has been calibrated using pulp samples with known head assays from previous drill campaigns by the Company. Standard

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		deviations for each element analysed are being recorded and retained. Elements being analysed are: Mg, Al, Si, P, S, K, Ca, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Rb, Sr, Y, Zr, Nb, Mo, Ag, Cd, Sn, Sb, W, Hg, Pb, Bi, Th, and U. Four completed diamond drillholes were down hole surveyed by acoustic televiewer (GDH911, 912, 914 and 915) as a prequel to geotechnical logging during the 2015 drill campaign. A further six holes from the 2018 campaign have been down hole surveyed using acoustic televiewer and optical televiewer (18GEDH001, 002 and 003 and partial surveys of 18GERC005, 008 and 011) for 627 metres of data. Televiewer data was also collected during 2018 on some of the holes drilled in 2015 and prior. The holes surveyed were GRC0019, 0024, 0168, 0169, 0173, 0178, 0180, 0183, 0200 and Na253, Na258 and Na376 for a further 286.75 m of data. All 12 of the 2019 down dip PQ holes have been televiewer surveyed.
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	QAQC results from both the primary and secondary assay laboratories show no material issues with the main variables of interest for the recent assaying programmes.
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel.	Diamond drill core photographs have been reviewed for the recorded sample intervals. Geologica Pty Ltd Consultant, Brian Davis, visited the Australian Vanadium Project site and the BV core shed and assay laboratories in September 2015 and on multiple occasions over a 10-year period. Whilst on site, the drillhole collars and remaining RC chip samples were inspected. All of the core was inspected in the BV facilities in Perth and selected sections of drillholes were examined in detail in conjunction with the geological logging and assaying. Resource consultants from Trepanier have visited the company core storage facility in Bayswater and reviewed the core trays for select diamond holes.
	The use of twinned holes.	Two diamond drillholes (GDH915 and GDH917) were drilled to twin the RC drillholes GRC0105 and GRC0162 respectively. The results show excellent reproducibility in both geology and assayed grade for each pair.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	All primary geological data has been collected using paper logs and transferred into Excel spreadsheets and ultimately a SQL Server Database. The data were checked on import. Assay results were returned from the laboratories as electronic data which were imported directly into the SQL Server database. Survey and collar location data were received as electronic data and imported directly to the SQL database. All of the primary data have been collated and imported into a Microsoft SQL Server relational database, keyed on borehole identifiers and assay sample numbers. The database is managed using DataShed™ database management software. The data was verified as it was entered and checked by the database administrator (MRG) and AVL personnel
	Discuss any adjustment to assay data.	No adjustments or calibrations were made to any assay data, apart from resetting below detection limit values to half positive detection values.

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Location of data points	Accuracy and quality of surveys used to locate drillholes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.	The 2019 drill holes have been set out using a real-time Kinematic (RTK) GPS system. At completion of drilling the collar positions were picked up by a professional surveyor with an RTK system. For the 2018 drilling, all collars were set out using a handheld GPS. After drilling they were surveyed using a Trimble RTK GPS system. The base station accuracy on site was improved during the 2015 survey campaign and a global accuracy improvement was applied to all drillholes in the Company database. For the 2015 drilling, all of the collars were set out using a Trimble RTK GPS system. After completion of drilling all new collars were re- surveyed using the same tool. Historical drill holes were surveyed with RTK GPS and DGPS from 2008 to 2015, using the remaining visible collar location positions where necessary. Only five of the early drillholes, drilled prior to 2000 by Intermin, had no obvious collar position when surveyed and a best estimate of their position was used based on planned position data. Downhole surveys were completed for all diamond holes, using gyro surveying equipment, as well as the RC holes drilled in 2015 (from GRC0159). Some RC drillholes from the 2018 campaign do not have gyro survey as the hole closed before the survey could be done. These holes have single shot camera surveys, from which the dip readings were used with an interpreted azimuth (nominal hole setup azimuth). The holes with interpreted azimuth are all less than 120m depth. All other RC holes were given a nominal -60º dip measurement. These older RC holes were almost all 120m or less in depth.
	Specification of the grid system used.	The grid projection used for the Australian Vanadium Project is MGA_GDA94, Zone 50. All reported coordinates are referenced to this grid.
	Quality and adequacy of topographic control.	High resolution Digital Elevation Data was captured by Arvista for the Company in June 2018 over the MLA51/878 tenement area using fixed wing aircraft, with survey captured at 12 cm GSD using an UltraCam camera system operated by Aerometrex. The data has been used to create a high-resolution Digital Elevation Model on a grid spacing of 5m x 5m, which is within 20 cm of all surveyed drill collar heights, once the database collar positions were corrected for the improved ground control survey, that was also used in this topography survey. The vertical accuracy that could be achieved with the 12 cm GSD is +/- 0.10 m and the horizontal accuracy is +/- 0.24m. 0.5m contour data has also been generated over the mining lease application. High quality orthophotography was also acquired during the survey at 12cm per pixel for the full lease area, and visual examination of the imagery shows excellent alignment with the drill collar positions. The November 2018 Mineral Resource used this surface for topographic control within the Mining Lease Application area (MLA51/878). For the entire 2017 and July 2018 Mineral Resource estimates, and the November 2018 Mineral Resource estimate outside the MLA area, high resolution Digital Elevation Data was supplied by Landgate. The northern two thirds of the elevation data is derived from ADS80 imagery flown September 2014. The data has a spacing of 5M and is the most accurate available. The southern third is film camera derived 2005 10M grid, resampled to match it with the 2014 DEM. Filtering was applied and height changes are generally within 0.5M. Some height errors in the 2005 data may be +/- 1.5M when measured against AHD but within the whole area of interest any relative errors will mostly be no more than +/- 1M. In 2015 a DGPS survey of hole collars and additional points was taken at conclusion of the drill program. Trepanier compared the elevations the drillholes with the supplied DEM surface and found them to be within 1m accuracy. An improved ground control point has been established at the Australian Vanadium Project by professional

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		surveyors. This accurate ground control point was used during the acquisition of high quality elevation data. As such, a correction to align previous surveys with the improved ground control was applied to all drill collars from pre-2018 in the Company drill database. Collars that were picked up during 2018 were already calibrated against the new ground control. 2019 drill collar locations have been verified with a DGPS in the field (accuracy about 20 cm on the horizontal) with final RTK pick up complete.
Data spacing and distribution	Data spacing for reporting of Exploration Results.	The 2018 RC drilling in Fault Block 17 has infilled areas of 260 m spaced drill lines to about 130m spaced drill lines, with holes on 30 m centres on each line. The closer spaced drilled areas of the deposit now have approximately 80m to 100m spacing by northing and 25m to 30m spacing by easting. Occasionally these spacings are closer for some pairs of drillholes. Outside of the main area of relatively close spaced drilling (approximately 7015400mN to 7016600mN), the drillhole spacing increases to several hundred metres in the northing direction but maintains roughly the same easting separation as the closer spaced drilled area.
	Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.	The degree of geological and grade continuity demonstrated by the data density is sufficient to support the definition of Mineral Resources and the associated classifications applied to the Mineral Resource estimate as defined under the 2012 JORC Code. Variography studies have shown very little variance in the data for most of the estimated variables and primary ranges in the order of several hundred metres.
	Whether sample compositing has been applied.	All assay results have been composited to one metre lengths before being used in the Mineral Resource estimate. This was by far the most common sample interval for the diamond drillhole and RC drillhole data.
Orientation of data in relation to geological structure	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	The grid rotation is approximately 45^{o} to 50^{o} magnetic to the west, with the holes dipping approximately 60^{o} to the east. The drill fences are arranged along the average strike of the high grade mineralised horizon, which strikes approximately 310^{o} to 315^{o} magnetic south of a line at 7015000mN and approximately 330^{o} magnetic north of that line. The mineralisation is interpreted to be moderate to steeply dipping, approximately tabular, with stratiform bedding striking approximately north-south and dipping to the west. The drilling is exclusively conducted perpendicular to the strike of the main mineralisation trend and dipping approximately 60^{o} to the east, producing approximate true thickness sample intervals through the mineralisation.

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	If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.	The orientation of drilling with respect to mineralisation is not expected to introduce any sampling bias. Drillholes intersect the mineralisation at an angle of approximately 90 degrees. The 2019 PQ diamond holes are deliberately drilled down dip to maximise the amount of metallurgy sample collected for the pilot study. They are not intended to add material to the resource estimation, or to define geological boundaries, though where further control on geological contacts is intercepted, this will be used to add more resolution to the geological model.
Sample security	The measures taken to ensure sample security.	Samples were collected onsite under supervision of a responsible geologist. The samples were then stored in lidded core trays and closed with straps before being transported by road to the BV core shed in Perth (or other laboratories for the historical data). RC chip samples were transported in bulk bags to the assay laboratory and the remaining green bags are either still at site or stored in Perth. RC and core samples were transported using only registered public transport companies. Sample dispatch sheets were compared against received samples and any discrepancies reported and corrected.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	A review of the sampling techniques and data was completed by Mining Assets Pty Ltd (MASS) and Schwann Consulting Pty Ltd (Schwann) in 2008 and by CSA in 2011. Neither found any material error. AMC also reviewed the data in the course of preparing a Mineral Resource estimate in 2015. The database has been audited and rebuilt by AVL and MRG in 2015. In 2017 geological data was revised after missing lithological data was sourced. Geologica Pty Ltd concludes that the data integrity and consistency of the drillhole database shows sufficient quality to support resource estimation.