



Australian
VANADIUM
LIMITED

The Australian Vanadium Project

Corporate Presentation

May 2019 | ASX: AVL

DISCLAIMER

The views expressed in this presentation contain information derived from publicly available sources that have not been independently verified. No representation or warranty is made as to the accuracy, completeness or reliability of the information.

COMPETENT PERSON REFERENCES

Competent Person Statement – Mineral Resource Estimation The information in this presentation 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 Mr Davis is a member of the Australian Institute of Geoscientists 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 presentation 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 presentation that relates to Ore Reserve estimates for the Project is based on information compiled by Mr Roselt Croeser, an independent consultant to AVL. Mr Croeser is a member of the Australasian Institute of Mining and Metallurgy. 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 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Croeser consents to the inclusion in the presentation 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 presentation 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. Mr 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 presentation of the matters based on the information made available to him, in the form and context in which it appears.

The information is extracted from the announcement entitled "Gabanintha Pre-Feasibility Study and Maiden Ore Reserve" released to ASX on 19 December 2018 and is available on the Company website at www.australianvanadium.com.au.

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 Resources 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.

FORWARD LOOKING STATEMENTS

This presentation 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.

Developing the Globally Significant High-Grade Australian Vanadium Project

Pre-feasibility study completed showing strong economic fundamentals.

Definitive study well underway with a highly experienced vanadium expert team.



Australian Vanadium Limited

Corporate Snapshot



Key Statistics (as at 10-5-19)

Ordinary shares on issue	1,97m
Share price	A\$0.02
Market Cap (undiluted)	A\$38m
Cash	~A\$6m
Shareholders	6,700
Enterprise Value	A\$31m



AVL Share Price History



Australian Vanadium Limited

Investment Highlights



At a vanadium price of US\$13/lb, the project has a post-tax NPV_{8%} of

NPV US\$616 million

- Globally significant project with high-grade Resources and Reserves hosted in magnetite-bearing rocks.
- Pre-feasibility study completed with strong economic fundamentals through all price cycles.
- Pilot Scale processing underway as part of definitive study - due for completion late 2019.
- Highly experienced corporate and vanadium expert team.
- Developing a vertically integrated vanadium business with exposure to vanadium applications in steel and energy storage.
- Ongoing studies focused on de-risking and improving project valuation.

Expert Vanadium Team

Vanadium expertise separates AVL from other explorers

At Australian Vanadium Limited, our management is committed to fast-track this significant global resource.

Our team brings together experts in geoscience, mining, chemical engineering, marketing and corporate governance and has an extensive vanadium network and processing knowledge.



Vincent Algar
Managing Director



Daniel Harris
Technical Director

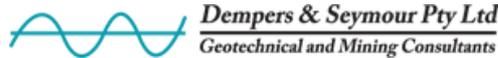


Todd Richardson
Chief Operating Officer

Expert Vanadium Team

Vanadium expertise separates AVL from other explorers

AVL is supported by a group of highly skilled external consultants which includes:



The Australian Vanadium Project



HIGH-GRADE RESOURCE
96.7MT at 1% V_2O_5



MINERAL RESOURCE ESTIMATE
183.6Mt at 0.76% V_2O_5



MINE LIFE
17+ Years



OPEX
US\$4.15/lb V_2O_5



VANADIUM PRODUCTION
22.5Mlbs per Annum



60%
Average Yield



CAPITAL COSTS
US\$354M



PROVED RESERVE
9.82Mt at 1.07% V_2O_5



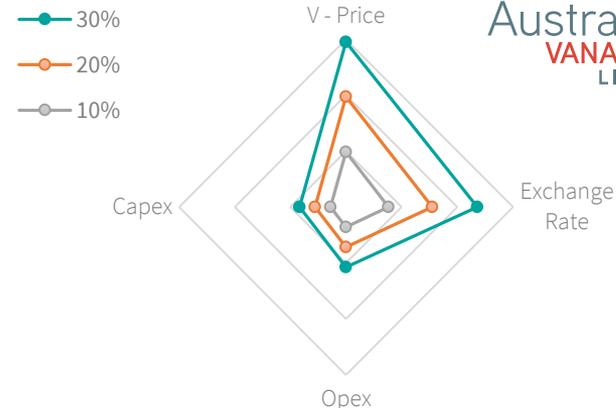
PROBABLE RESERVE
8.42Mt at 1.01% V_2O_5

Financial Model Results - PFS

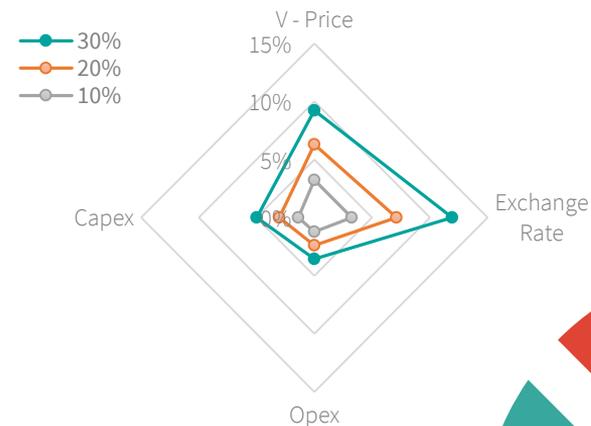
- C1 costs \$4.15/lb – optimisation underway
- Mineral Reserve defined to support 17 year initial Mine schedule
- Conventional Vanadium salt roast processing route selected
- Significant potential to improve project economics identified and being actively investigated through multiple option studies

	V ₂ O ₅ Product Pricing Scenarios			
Pricing Year 1–5	\$8.67/lb V ₂ O ₅	\$13/lb V ₂ O ₅	\$13/lb V ₂ O ₅	\$20/lb V ₂ O ₅
Pricing Year 6–17	\$8.67/lb V ₂ O ₅	\$8.67/lb V ₂ O ₅	\$13/lb V ₂ O ₅	\$20/lb V ₂ O ₅
Pre-tax NPV _{8%}	\$230M	\$444M	\$912M	\$2,013M
Post-tax NPV _{8%}	\$125M	\$280M	\$616M	\$1,410M
IRR	12.4%	19.7%	27.2%	47.5%
Pre-tax UDCF	\$1,232M	\$1,634M	\$3,166M	\$6,292M
Post-tax UDCF	\$867M	\$1,148M	\$2,221M	\$4,409M

NPV Sensitivity



IRR Sensitivity



The Australian Vanadium Project

Project in active mining region close to road, rail, port and natural gas

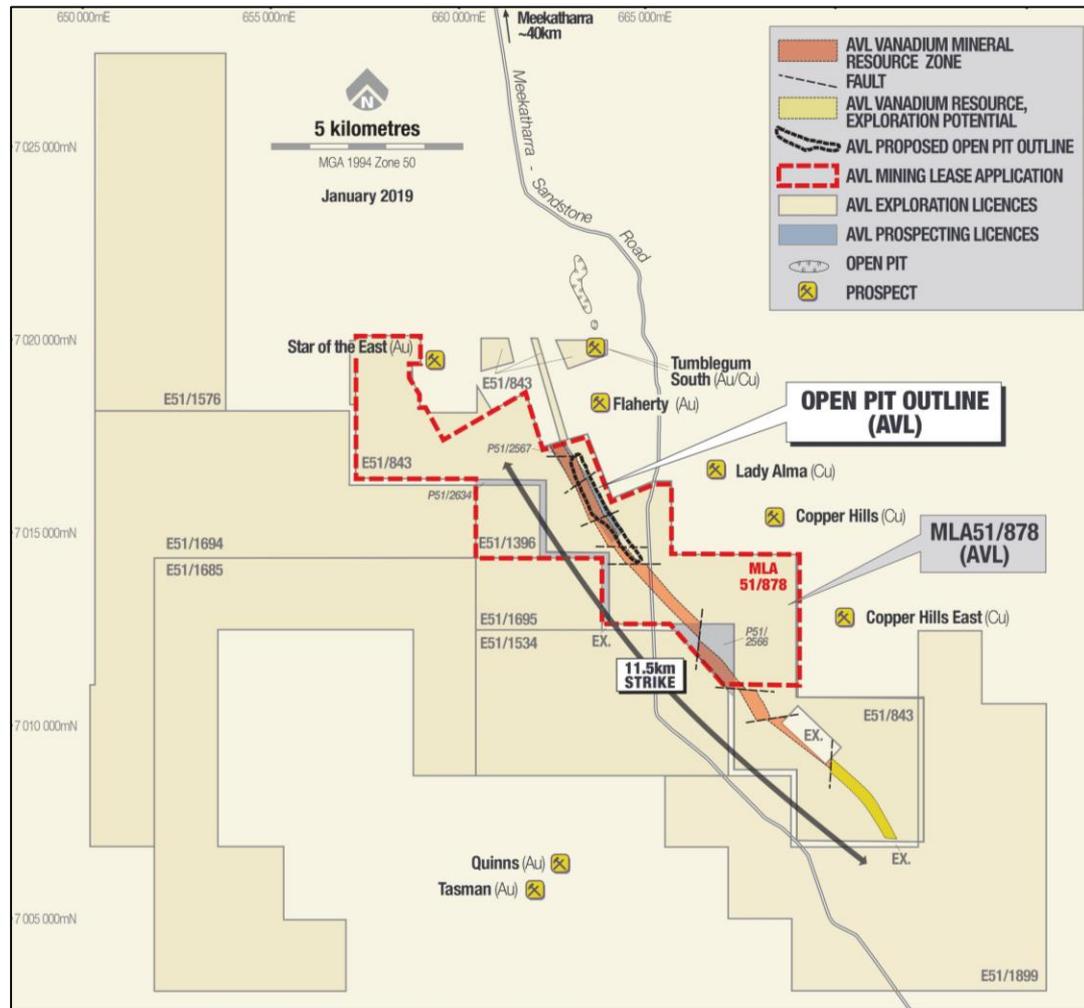
WA ranked 2nd in the world's best mining investment locations



The Australian Vanadium Project

Tenure and Location Plan

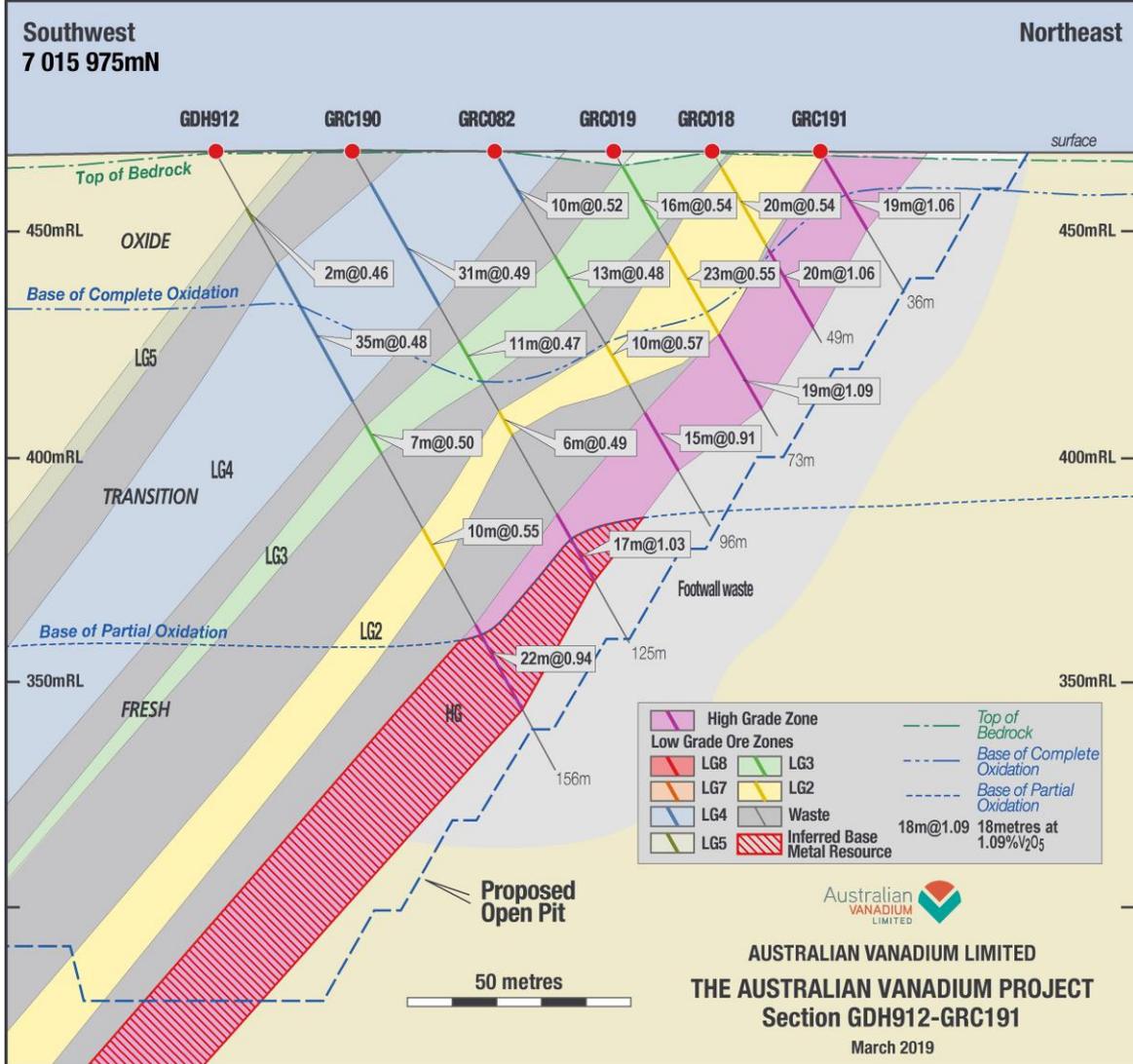
11.5km of known mineralisation under 100% AVL control



The Australian Vanadium Project

Geology

- Bushveld-type VTM deposit, drilled over 11km of AVL controlled strike
- AVL holds significant ground position for project development
- Highly consistent geology over 11.5km of AVL controlled strike
- Massive magnetite averaging 15–20m in true thickness



**MINING SEQUENCE
YEAR 0 - 14**

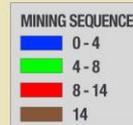
December 2018

**MINING SEQUENCE
YEAR 0**

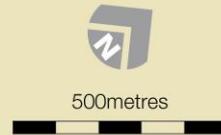
**MINING SEQUENCE
YEAR 0 - 4**

**MINING SEQUENCE
YEAR 4 - 8**

**MINING SEQUENCE
YEAR 14**

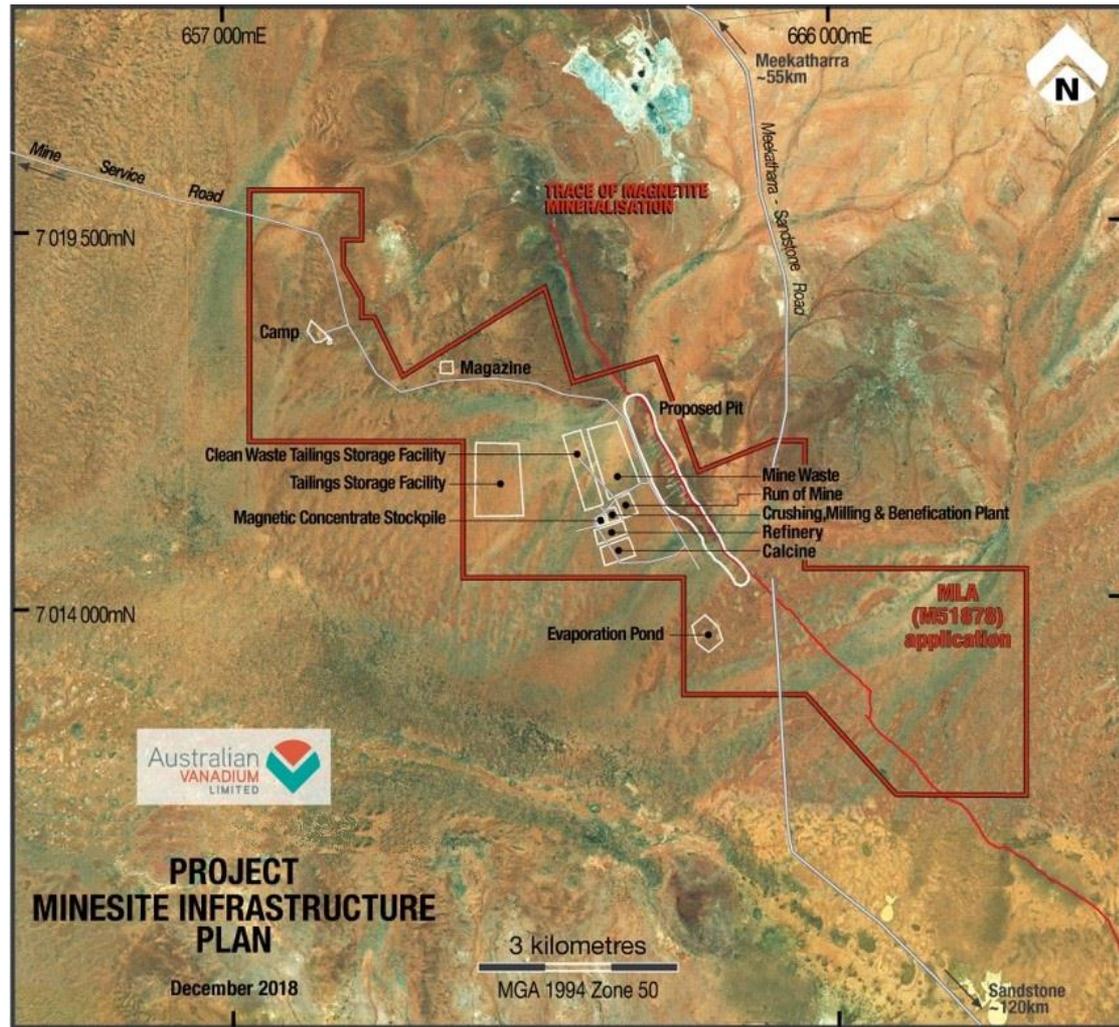


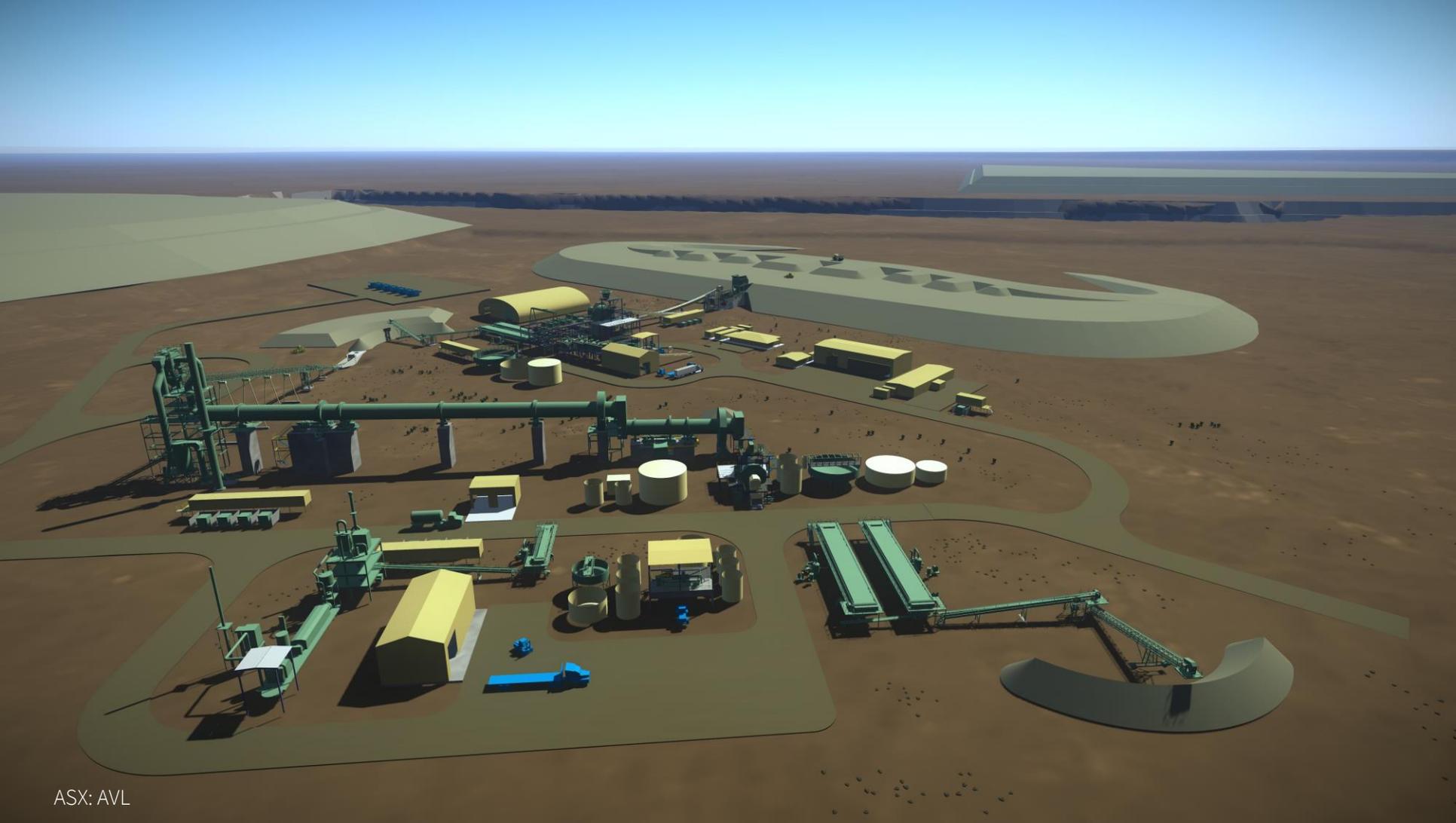
PROPOSED PIT



The Australian Vanadium Project

Planned Infrastructure





Highlights

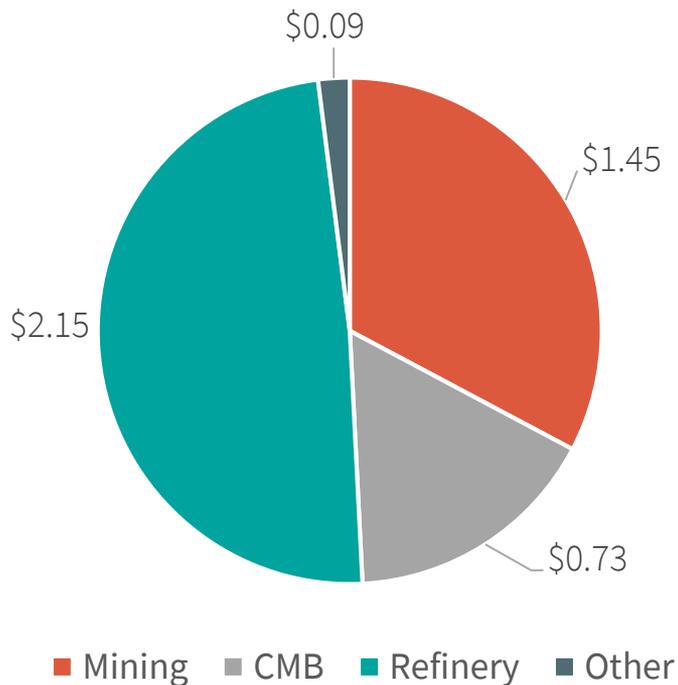
- Plant Capital US\$260M ($\pm 25\%$)
- Total project cost \$US\$354M
- Production rate of 22.5Mlb V_2O_5 or 5,650MTV
- Ability to produce high purity V_2O_5 powder for superalloys and energy storage
- 17-year initial mine life defined, potential for extension
- Resource strike covers 11km, current mine plan based on 2.5km
- Opex of \$4.15/lb V_2O_5 equivalent
- Low cost base metal (cobalt nickel copper) recovery circuit improves overall operating expenses



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Total PFS Opex Breakdown

US\$/lb V₂O₅

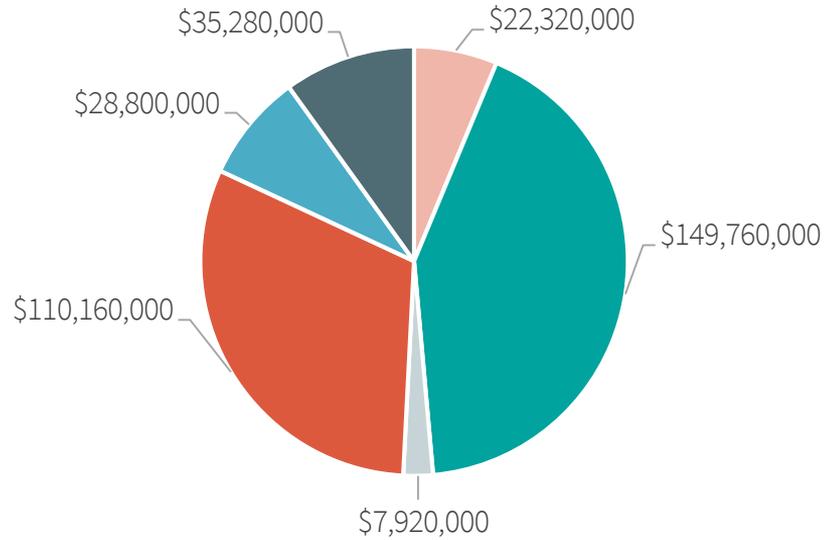


Total Opex	US\$/lb V ₂ O ₅	\$/a
Mining *	\$1.37	\$31M
CMB*	\$0.71	\$16M
Refinery*	\$2.05	\$46M
Other*	\$0.10	\$2M
By-product credits*	-\$0.07	-\$2M
Total	\$4.15	\$93M

* Identified opportunities to improve in DFS

Total Capex Breakdown

US\$



- Mining & Pre-Strip
- Processing Plant
- Sulphide Float
- Infrastructure
- Gas Pipeline
- Owner's Contingency

Total Capex	US\$	Comment
Processing Plant	\$149.76M	
Infrastructure	\$110.160M	
Subtotal	\$259.92M	
Mining & Pre-Strip*	\$22.32M	Improve in DFS
Gas Pipeline	\$28.8M	Own 50%
Sulphide Float	\$7.92M	Starts in Yr 3
Owner's Contingency	\$35.28M	
Total	\$354.24M	



Ongoing Testwork

- Pilot scale metallurgical test program on 30 tonnes underway
- Focus is on refining plant conditions and locking in optimisation opportunities
- Life-of-mine blends and recoveries being tested to confirm globally unique vanadium mass yields of over 60%
- Testwork at scale a key differentiator of successful projects – de-risking final design
- Definitive Feasibility Study underway

Social Responsibility

Alongside the legal responsibilities for native title claims and environmental regulations, AVL is keen to ensure that its mining activities in the Meekatharra region bring additional benefits

-  AVL sponsors the Stephen Michael Foundation which helps to engage children in school and improve their lives through sport
-  Subsidiary VSUN Energy is sponsoring the inimitable *Meeka Howler* through ongoing advertising
-  AVL is continuously analysing its processes to see where emission reduction can occur, including the use of solar plus VRFBs and non-traditional fuel sources for haulage



Carbon Footprint Lifecycle of Vanadium

Minimising supply chain emissions and protection of the environment including air quality are key elements of AVL's strategy. The company is undertaking numerous tasks in this area as part of its environmental compliance obligations, including;

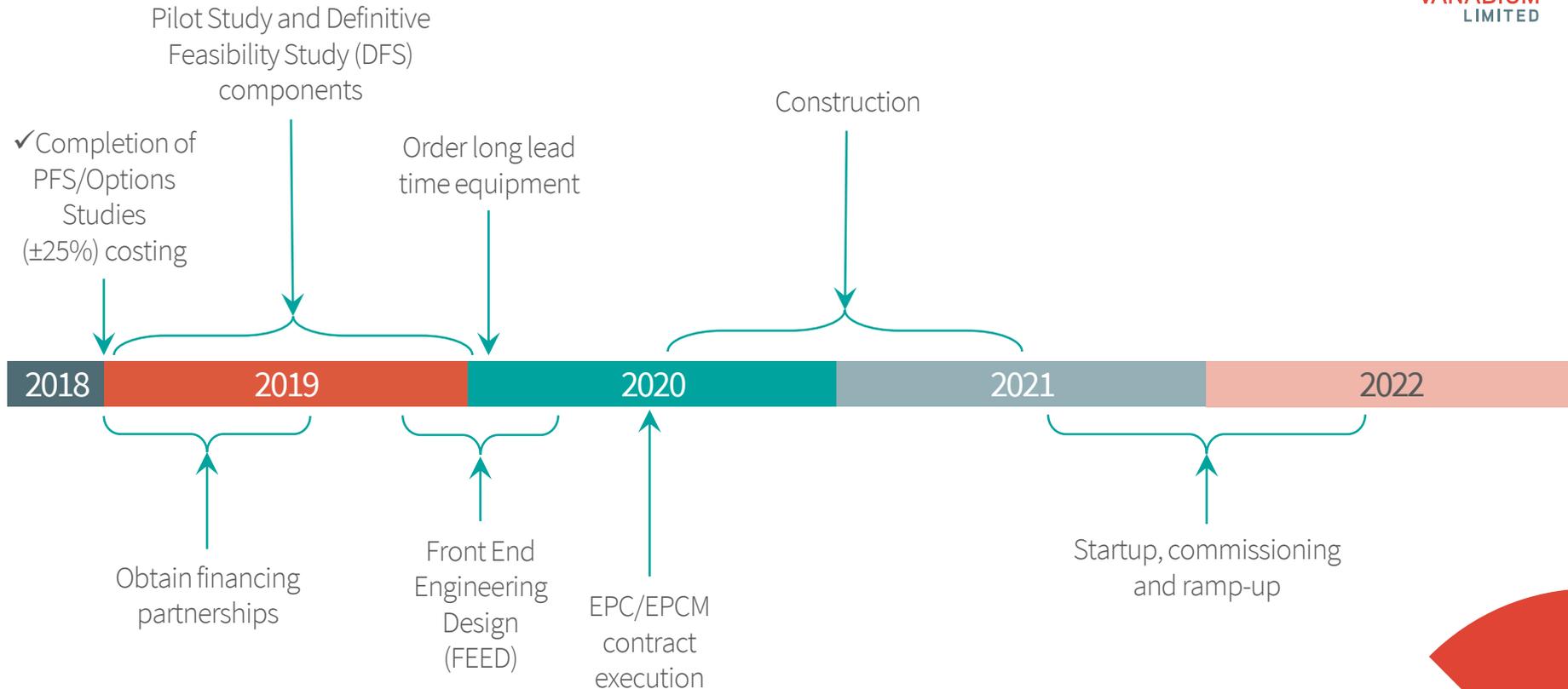
- A full project analysis of emissions generated through energy use, transport and processing.
- An off-set and emission reduction plan.
- Cost assessment of the plan with recommendations for immediate and future abatement schemes.
- Potential strategies to include electric vehicles for minesite and haulage; solar and VRFB for some energy requirements and air filtration technology.
- Understanding the lifecycle emissions of vanadium for the steel industry (in conjunction with work being undertaken by Vanitec).



The Australian Vanadium Project Path Forward

- ✓ Completion of PFS, options studies, Mineral Reserve – completed December 2018
- ✓ Pilot Study sample collection (30t) – commenced January 2019
- Pilot Study, Environmental Impact Studies, Heritage review – August 2019
- Financing – partnership agreement /MOUs in place – August 2019
- Definitive Feasibility Study completion – December 2019
- Detailed design engineering completion – April 2020
- Order long lead time equipment – April 2020
- EPC/EPCM contract execution – June 2020
- Construction, startup, commissioning and ramp-up – 2020/2021

The Australian Vanadium Project Path Forward



Vanadium Market

Vanadium supply for steel currently in deficit, new markets for energy storage rapidly expanding

- Demand projections indicate market to remain in deficit in all sectors.
- Increased demand from VRFBs and other energy applications growing exponentially.
- Tightened environmental and quality controls in steel supply chain in China supporting new supply.
- Deposits with high in-situ grade combined with high concentrate grade will have the best chance of success.

Summary

AVL has a globally significant vanadium resource with a team of experts experienced in the extraction of vanadium using conventional processing of vanadium magnetite

- Pre-feasibility study completed with strong economic fundamentals through all price cycles
- Pilot scale processing underway as part of definitive study - due for completion late 2019
- Highly experienced corporate and vanadium expert team
- Developing a vertically integrated vanadium business with exposure to vanadium applications in steel and energy storage
- Ongoing studies focused on de-risking and improving project valuation
- Potential to become the world's lowest cost vanadium producer





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Vanadium Markets

Steel

Metal Bulletin V₂O₅ Monthly Midpoint Average Price Inflated to January 2019 US\$



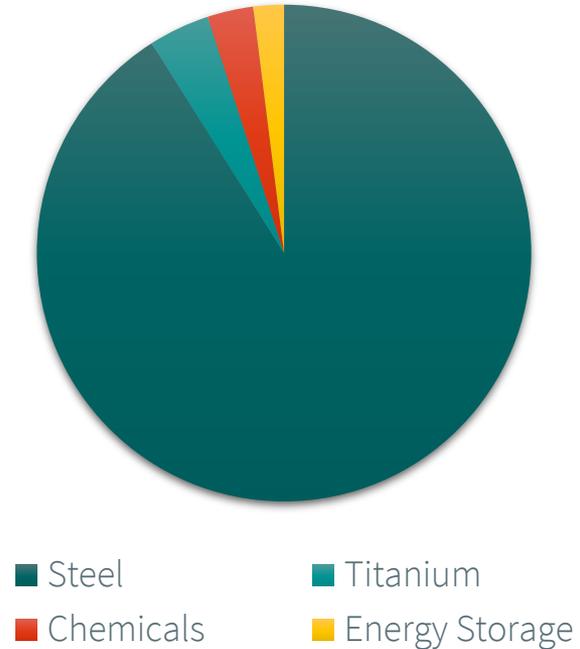
Source: Metals Bulletin/Fastmarkets publication

- 15-year average price US\$8.67 in 2018 dollars.
- Historically, vanadium pricing has experienced long periods of low price followed by periods of price rises.
- Competitive vanadium producers in lowest quartile are best positioned to survive downturns and therefore benefit from high price periods.
- Fundamental changes in vanadium market have tightened supply. New vanadium production must be competitive with the lowest cost primary producers.

Vanadium Markets – Steel

Steel remains the price driver and primary market for vanadium (92% of vanadium consumption)

- Key metric is Chinese rebar consumption
- New standards for Chinese rebar require increased vanadium use, doubling to rest-of-world standards (implemented today)
- Risk of substitution minimal due to unique micro-alloy effects
- New markets in steel will increase demand, such as:
 - Materials for automotive, aviation and aerospace
 - Powerlines and power pylons
 - High-strength steel structures





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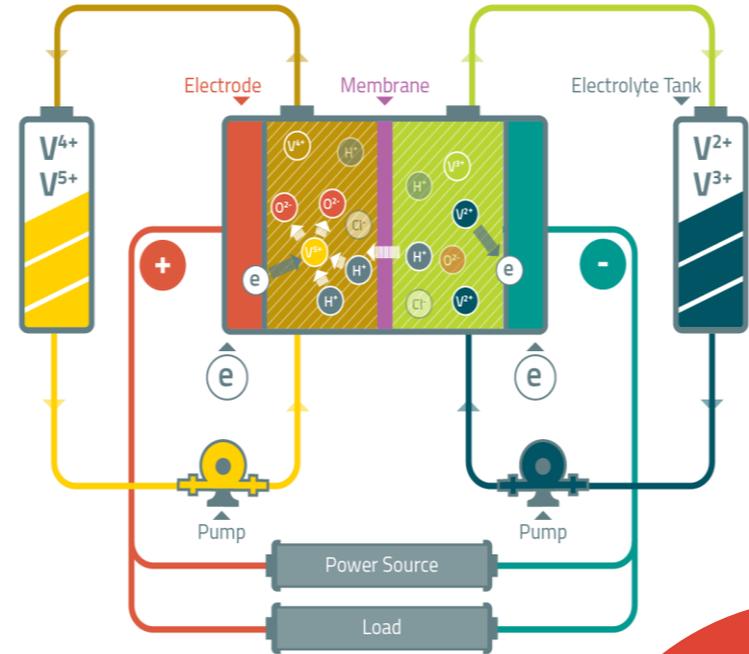
Vanadium Markets

Energy Storage

Vanadium Markets – Energy Storage

Unique characteristics of Vanadium Redox Flow Batteries (VRFBs)

- VRFBs provide a way to store and re-supply renewable energy. Their very high capacity is ideal for large-scale energy storage applications, unlocking the full potential of renewables while maintaining grid security
- VRFBs have unique advantages over other batteries:
 - Easily scaled into large MW scale solutions
 - Lifespan of 20 years with very high cycle life and no capacity loss over time
 - A key feature of using only one element in electrolyte, V_2O_5 which can be recycled
 - Immediate and rapid energy release
 - Non-flammable
 - Suitable for grid connection or off-grid use
 - Can discharge 100% with no damage
 - Improved safety and low replacement rate compared to Li-ion (lower lifetime LCOE)



VSUN Energy

Vertical integration strategy

- AVL's 100% owned subsidiary VSUN Energy is focused on growing the market for VRFBs
- Involvement in Future Battery Industries Cooperative Research Centre application
- First VRFB installed in Western Australia at a native tree nursery with 2.5 years continuous operation with no issues and no degradation in performance
- Potential for electrolyte production in Australia and either assembly or manufacture of VRFBs
- Markets include utility, industrial, commercial, education, agricultural, mining, remote, tourism, manufacturing and residential



Status of VRFB market

Vanadium price rises have led to innovations from manufacturers, with new entrants also entering the market

- Stack technology advancements, utilising welded stack technology
- Leasing of electrolyte, reducing capex and transferring some of the cost to opex
- Changing power to energy ratio to compete directly with lithium
- Incorporating VRFBs into solar farms to provide dispatchable energy
- Government incentive programs in countries such as China and Korea



VRFB Manufacturers

The number of manufacturers continues to grow, with a wide range of sizing available





Technical appendices

Resource Table

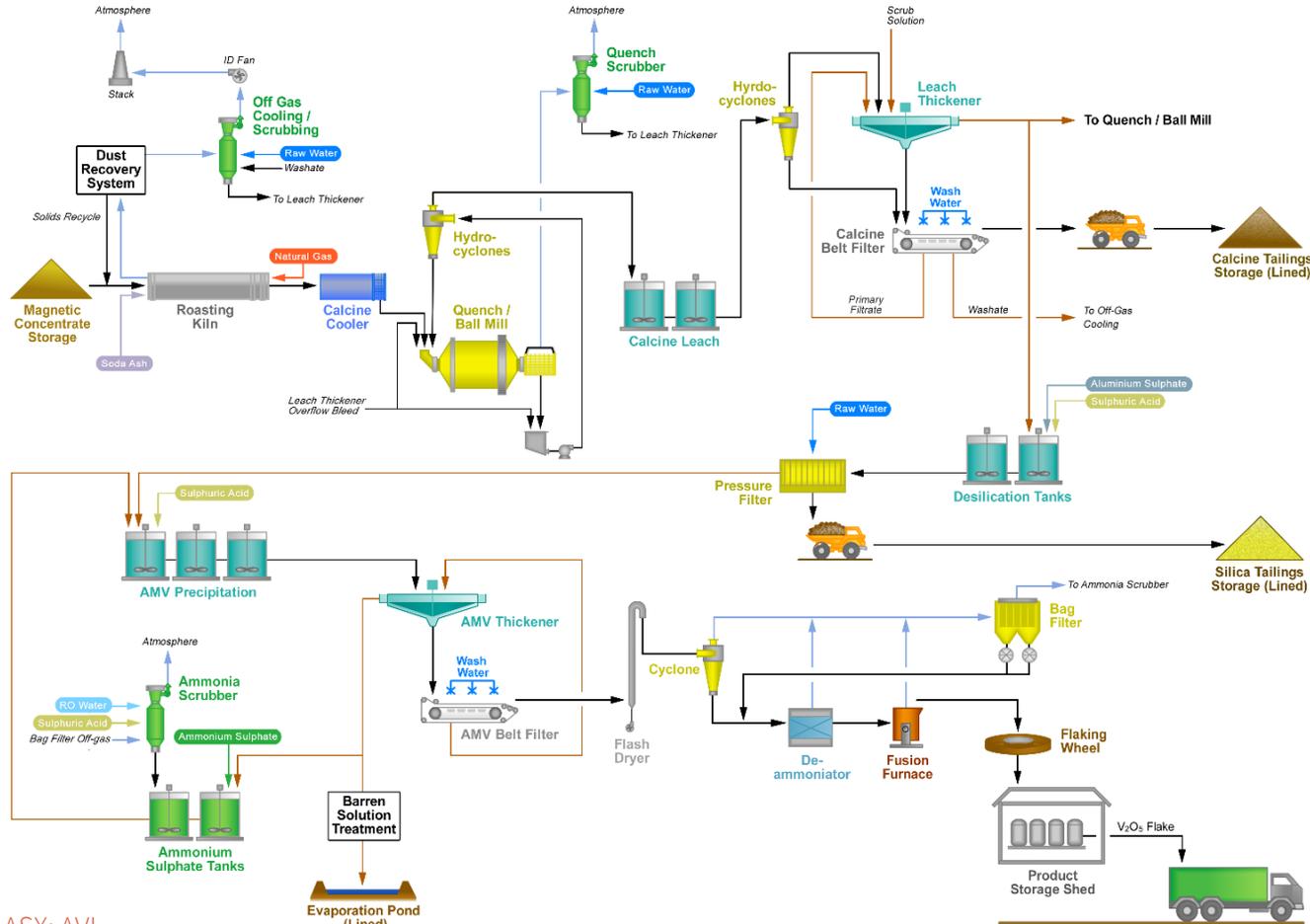
Material	JORC Resource Class	Million Tonnes	V ₂ O ₅ %	Fe%	TiO ₂ %	SiO ₂ %	Al ₂ O ₃ %	LOI%
High Grade	Measured	10.2	1.11	42.7	12.6	10.2	8.0	3.9
	Indicated	12.1	1.05	43.8	11.9	10.6	7.6	3.5
	Inferred	74.5	0.97	42.1	11.2	11.6	7.6	3.4
	Subtotal – High Grade	96.7	1.00	42.4	11.4	11.3	7.7	3.5
Low Grade	Indicated	28.6	0.5	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
	Subtotal – Low Grade	82.5	0.49	25.1	6.8	27.5	16.9	7.7
Transported	Inferred	4.4	0.65	28.2	7.2	24.7	16.7	8.5
	Subtotal – Transported	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
	TOTAL	183.6	0.76	34.3	9.2	18.9	12.1	5.5

Note: Mineral Resource estimate by domain and resource classification using a nominal 0.4% V₂O₅ wireframed cut-off for low grade and nominal 0.7% V₂O₅ wireframed cut-off for high grade (total numbers may not add up due to rounding).

Ore Reserve

Reserve classification	t	V ₂ O ₅ %	Co ppm	Ni ppm	Cu ppm	S %	SiO ₂ %	Fe ₂ O ₃ %	V ₂ O 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

Refining – V₂O₅ Production



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