

## AGM Presentation November 2019

ASX:VML



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This presentation provides an overview of prospective rare earth projects ("the Projects") and development opportunities and contains "forward looking statements". Forward looking statements are all statements other than statements of historical fact included in this presentation including and without limitation those regarding the Projects' strategy, financial positions, plans and identification of additional resources and reserves. Such forward looking statements are subject to risk factors associated with exploration, development and the acquisitions of mining tenements and involve known and unknown risks, uncertainties and other factors. These risk factors could have a material effect on the operating, financial performance and achievements of the Projects and may cause the actual results to be materially different from any future operating , financial performance and achievements expressed or implied in the forward looking statements contained in this presentation. Although there are reasonable grounds for making the forward looking statements, such forward looking statements may be materially affected by changes in the underlying assumptions and changes to the environment which the Projects will operate in the future and such assumptions may or may not prove to be correct. Some of the underlying assumptions in this presentation are based on information which has not been independently verified.

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#### ASX Listing Ruel 5.13 Information

The Company has previously disclosed the foreign estimates in compliance with ASX Listing Rule 5.12 in the announcement dated 25 June 2019 titled "Vital to Transform into Rare Earth Oxide Developer" ("Announcement"). The Company is not in possession of any new information or data relating the foreign estimates that materially impacts on the reliability of the estimates or the Company's ability to verify the foreign estimates in accordance with Appendix 5A (JORC Code). The Company confirms that the supporting information provided in the Announcement continues to apply and has not materially changed.

Investors should note that the Mineral Resource estimate for the Wigu Hill Rare Earth Project is a foreign estimate and is not reported in accordance with the JORC Code. A competent person has not done sufficient work to classify this foreign estimate as a mineral resource in accordance with the JORC Code and it is uncertain that following further exploration or evaluation work that this foreign estimate will be able to be reported as a mineral resource in accordance with the JORC Code

Investors should note that the Mineral Resource estimate for the Nechalacho Project Upper Zone is a foreign estimate and is not reported in accordance with the JORC Code. A competent person has not done sufficient work to classify this foreign estimate as a mineral resource in accordance with the JORC Code and it is uncertain that following further exploration or evaluation work that this foreign estimate will be able to be reported as a mineral resource in accordance with the JORC Code

## **Corporate Snapshot**



Vital Metals Limited (ASX:VML) is an explorer and developer focussing on rare earths, with projects located in Canada and Tanzania

Capital Structure					
ASX Code	VML				
Shares on Issue	2.142m				
Performance Rights*	800m				
Current Options on Issue*	433.5m				
Share Price (as 12 November 2019)	\$0.012				
Market Capitalisation	\$25.70m				
Cash (30 September 2019)	\$8.6m				

Board of Directors		
Geoff Atkins	Managing Director	
Frances Harper	Chairman	
Zane Lewis	Executive Director	
Phil Coulson	Non-Executive Director	
Evan Cranston	Non-Executive Director	

\*For terms of performance rights and exercise price and expiry date of options, please see Appendix 3B dated 22 October 2019.

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## Rare Earths – Strategic Resources











Military Strategic Resources

- Jet engines, submarines, advanced weapons systems (lasers and satelites), communication networks and computing.
- Military's night-vision goggles, GPS equipment, batteries, and other defence electronics also utilise rare-earth elements

#### Green Energy

- Rare earth materials have also played a pivotal role in the development of state-of-the-art technologies used in the renewable energy industry.
- A 3MW wind turbine user 1,200kg + of RE's
- Projected to grow at a rate of over 7%

#### **Electric Vehicles**

- Rare earths are a critical component in EV Batteries
- EV's expected to grow from 3 million to 125 million by 2030
- Every electric car will use 0.5 1.5kgs more NdPr than the combustion engine it replaces

#### Oil

- Every barrel of oil fracked uses 3.8kgs of cracking catalysts
- In 2018 global oil production reached 75.78MMbpd

## **REO Supply Risk**



## **Rare Earths Entering Supply/Demand Imbalance** Annual development of new mines will be required from 2020

- 2011 price spike (up to 50x current prices) resulted in approximately a 20% reduction in demand due to concerns over supply security
- Reduced prices post-2011 resulted in a halt in the development of any new rare earth projects with existing projects now valued at a fraction of historical values
- Rare earth demand is again growing, with forecasts that 50% of all new global rare earth demand growth over the next 10 years being directly or indirectly driven by Government-led initiatives
- Accelerated demand is forecasted between 2020 and 2025, which require a new rare earth mine (20,000tpa) to be brought into production every year
- China will become a net importer of certain rare earths by 2025 and is therefore actively looking for investment opportunities in rare earth projects outside of China



## **Rare Earths Entering Supply/Demand Imbalance** Annual development of new mines will be required from 2020

- To meet global rare earth demand, new mines with production of 20,000t REO per year are required by 2021
- To achieve this, projects of this size would have to have immediate financing and immediate approval
- NO projects of this scale exist at this state of readiness
- The first companies in production will have a significant strategic advantage



Source: Adamus Intelligence

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## Lanthanum and Neodymium



## Lanthanum and Neodymium Supply/Demand Imbalance

- Demand for both neodymium and lanthanum is forecast to grow significantly from 2021
- With new projects typically taking 2-4 years to reach production, there is a risk of significant supply/demand imbalance
- Note that production forecasts include the assumption of two new mines entering production by 2021







Global annual lanthanum production-demand balance from 2005 through to 2025

Source: Adamus Intelligence



## The right people with the ability to execute

#### **Geoff Atkins - Managing Director**

- Civil Engineer with over 20 years of project and corporate development experience across commercial, industrial, mining and infrastructure sectors, with responsibility for driving projects from concept, through feasibility and development to operational assets
- Managing Director of Cheetah Resources, with other recent roles include Corporate Planning Manager at Lynas Corporation where he oversaw development and implementation of the corporate strategic planning process

#### Matthew Edler – General Manager

- Former General Manager for Lynas Corporation and was responsible for all in-country activities for the Kangankunde rare earth project Malawi
- Geologist with over 30 years of resource development experience across Africa, the Americas and Asia

#### Darren Sutten – Process Engineer

- Former Process Engineer at Lynas Corporation and Hastings Technology Metals and developed the process flow fleet for Lynas' Mt Weld and Hastings' Yangibana rare earth project
- Responsibilities included concentration, leaching and solvent extraction plus customer acceptance of the final mixed rare earth

Successful rare earth companies have the 'right' people, a different approach to development and projects which meet a well defined strategic criteria



# Traditional Rare Earths Project Development Model

## **Traditional Development Strategy**



Increased Complexity

Project Defined





- Due to the specialised nature of rare earths are subject to a rigorous customer acceptance process which commences with plant commissioning
- Between plant commissioning and customer acceptance it may be 4-5 years before all production of a large plant will receive acceptance



## **REO Projects developed by Junior Explorers**



## **Traditional Rare Earth Development Strategy**

- Green field rare earth projects will typically be developed by junior mining companies
- Typically the largest possible project will be developed
- Capital costs will often exceed \$500M and often \$1B
- Investment returns will take 8-10 years from the commencement of construction
- A large proportion of construction and working capital funding will be sourced from equity
- Result = massive equity dilution for shareholders



Lynas Corporation 's cracking and separation facility Kuatan , Malaysia



HIGHWOOI RESOURCE

# **The Vital Metals Strategy**

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## Vital Metals Development Strategy





## Scale Operations with Customer Acceptance



- use only of personal
- Matching production capacity to customer acceptance volumes
- Target annual production growth to match acceptance ramp up
- Minimise initial capex to reduce shareholder dilution





### The quality of a resource is more important than the size

• A typical project will not process more than 5Mt of ore over a 20 year mine life.

#### Ease of processing is more important than grade

• A low grade deposit with clearly defined rare earth mineral crystals is preferable to higher grade deposits with mineralisation indistinguishable from waste

#### Profitability is more important than product mix

• Whilst certain REO elements are more desirable/valuable producing REO for a profit is preferable to producing more valuable REO at a loss

## Mineralogy better than Grade



- High Grade REO ore from Mt Weld (LHS), Wigu Hill and Nechalacho (RHS)
- LHS waste not distinguishable from REO ore
- RHS high grade REO ore easily distinguishable (Crystals / Red Bastnasite Ore)
- Amenable to Ore Sorting for initial concentration
- Ore sorting significantly cheaper OPEX than floatation









# Nechalacho Canada

## Nechalacho REO Project - Canada



## (100% of Upper Zone)

#### Large World Class REO Resource

149.30MT at 1.43% REO (indicated and inferred)

#### Tier 1 Mining Jurisdiction

#### Excellent infrastructure

- Located 100km from Yellowknife
- 40 person camp with air strip
- Barge access in summer Ice Road winter

#### Previous Owners spent C\$100m+

- Targeting heavy rare earth basal zone
- Completed DFS 2013 \$1.6B CAPEX including separator
  - Upper Zone acquired for C\$5m in 2018

#### Fully permitted for large scale operation

#### Vital to target LREO Upper Zone

Lower CAPEX and OPEX potential



## Target Light Rare Earths Zone



## (100% of Upper Zone)

#### Initial Targets North T and Tardiff Zones

- Small higher grade starter pits targeting Bastnasite Mineralisation
- Current Resource ~ 3.2mt at 2.4% TREO

#### **Bastnasite mineralisation**

- Amenable to concentration via ore sorting
- No water or reagents required

#### Initial concentration done on site only

 Barge high grade concentrate to off site location for "cracking"











## Containing a historical NI43-101 Resource of 149Mt@1.42% REO

#### Nechalacho Upper Zone

Resource Type	Mt	TREO (%)	HREO (%)	HREO/TREO
Indicated	47.21	1.52%	0.15%	10.11%
Inferred	102.09	1.38%	0.13%	10.01%
Indicated and Inferred	149.3	1.42%	0.14%	10.07%

Rare Earth Resources of the Upper Zone, Lake Zone Deposit, Nechalacho. Mineral Resource Estimation as per Avalon News Release issued and dated August 15, 2013, prepared in accordance with NI-43-101 with Dr. William Mercer, VP-Exploration, as the Qualified Person. The cutoff grade for this resource estimate was based on a net metal value of the contained rare earth elements at US\$345/tonne, reflecting rare earth pricing at the time and including metallurgical recovery estimates.

The 2013 resource estimate for the Upper Zone was prepared under 2013 rare earth prices for the purposes of a feasibility study on the whole of the Nechalacho Property focused on development of the underlying Basal Zone of the Nechalacho deposit. In addition, the metallurgical recoveries utilized for the cutoff grade calculation were based on testwork completed only on Basal Zone rock, which has different metallurgical characteristics to the Upper Zone mineralization because of more complex mineralogy. A revised estimate of the resource between surface and 150m elevation is in preparation that will also include cutoff grades reflecting present rare earth prices and revised metallurgical recoveries





## Wigu Hill REO Project (Tanzania) (90%)



#### Excellent infrastructure

Rail and Power within 10 km of project

#### Previous Owners spent US\$10m+

Acquired for US\$1m 2018

Barrack and Tanzania Gov recently resolved mining issues

Vital to target Wigu Hill – as second development project

#### Potential to be a large world class resource

Current high grade resource of 3.3Mt at 2.6% REO

## Mineralise widespread over entire hill with only 2 out of 10 known target drilled



## Target Light Rare Earths Zone



#### Bastnasite mineralisation

- Amenable to concentration via ore sorting
- No water or reagents required

#### Initial concentration done on site only

 Barge high grade concentrate to off site location for "cracking"





## Contains a historical NI43-101 Resource of 3.3Mt@2.6% REO

Zone	Mt	TREO (%)	La2O3 %	CeO₂ %	Pr <sub>6</sub> O <sub>11</sub> (%)	Nd₂O₃ (%)
Twiga NE	1.6	2.6%	0.98%	1.26%	0.1%	0.23%
Twiga SW	0.5	3.6%	1.33%	1.71%	0.13%	0.3%
Tembo NW	0.9	2.2%	0.78%	1.09%	0.09%	0.23%
Tembo SE	0.2	2.2%	0.69%	1.1%	0.1%	0.27%
Total Inferred Resource	3.3	2.6%	0.96%	1.27%	0.1%	0.24%

1. The effective date for this Inferred Mineral Resource Statement is 25 August 2011 and reported on SEDAR (contained in a Canadian National Instrument NI 43-101 Technical Report by AMEC Earth and Environmental UK Ltd.).

2.A selective mining unit (SMU) size of 3m by 3m by 3m was assumed when creating the block model.

3.Reported grades are based on consideration of the grades of mineralised material and weakly to non-mineralised wallrock material estimated to fall within each SMU

4. The reported Mineral Resource is based on a grade cut-off of 1.0% LREO5 (sum of estimated grades of La<sub>2</sub>O<sub>3</sub>, CeO<sub>2</sub>, Pr<sub>6</sub>O<sub>11</sub>, Nd<sub>2</sub>O<sub>3</sub> and Sm<sub>2</sub>O<sub>3</sub>).

5. The Mineral Resources for the Twiga and Tembo deposits have been constrained by an optimised pit shell defined by the following assumptions, slope angles of 50°; a mining dilution of 0% (already incorporated in the SMUs); a mining cost of USD2.85/t; process operating costs of USD12.0/t; G&A costs of USD3.0/t of resource, with a 90% recovery of REOs to a 45% LREO5 bastnaesite concentrate; and a concentrate price of USD10/kg

## **Next Steps**



## FY 2020 Development Strategy - Nechalacho Project



Following the conversion of the Nechalacho and Wigu Hill resources from Foreign Estimates to JORC Resources, VML will be in a position to announce specific project development options.



# Contact

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