

# KING RIVER COPPER LIMITED

Australia's largest Vanadium in magnetite deposit ... delivering the highest Vanadium grade in concentrate

**VANADIUM CONCEPT STUDY UNDERWAY**  
High Purity Vanadium Pentoxide, Titanium Dioxide and Iron Oxide

ASX: KRC

**ASX:KRC - EXPLORING NEW HORIZONS**

**April 2018**

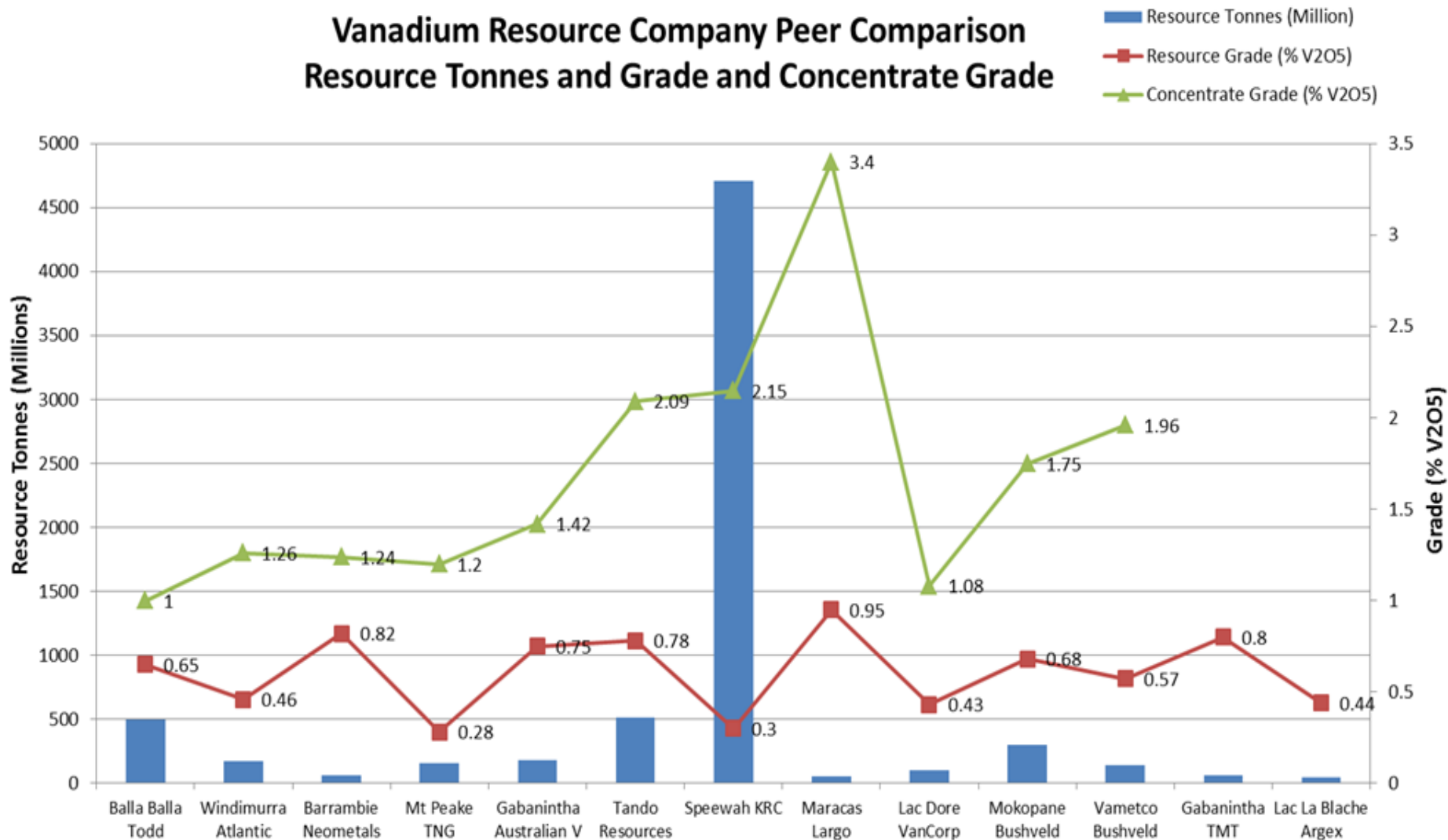
# Project location



- Nearby infrastructure includes sealed major highway, Wyndham Port, Ord River Dam and hydro electric project, Kununurra skilled workforce and industry involved with servicing the Argyle Diamond project.
- The project is ~110 kilometres southwest of Kununurra

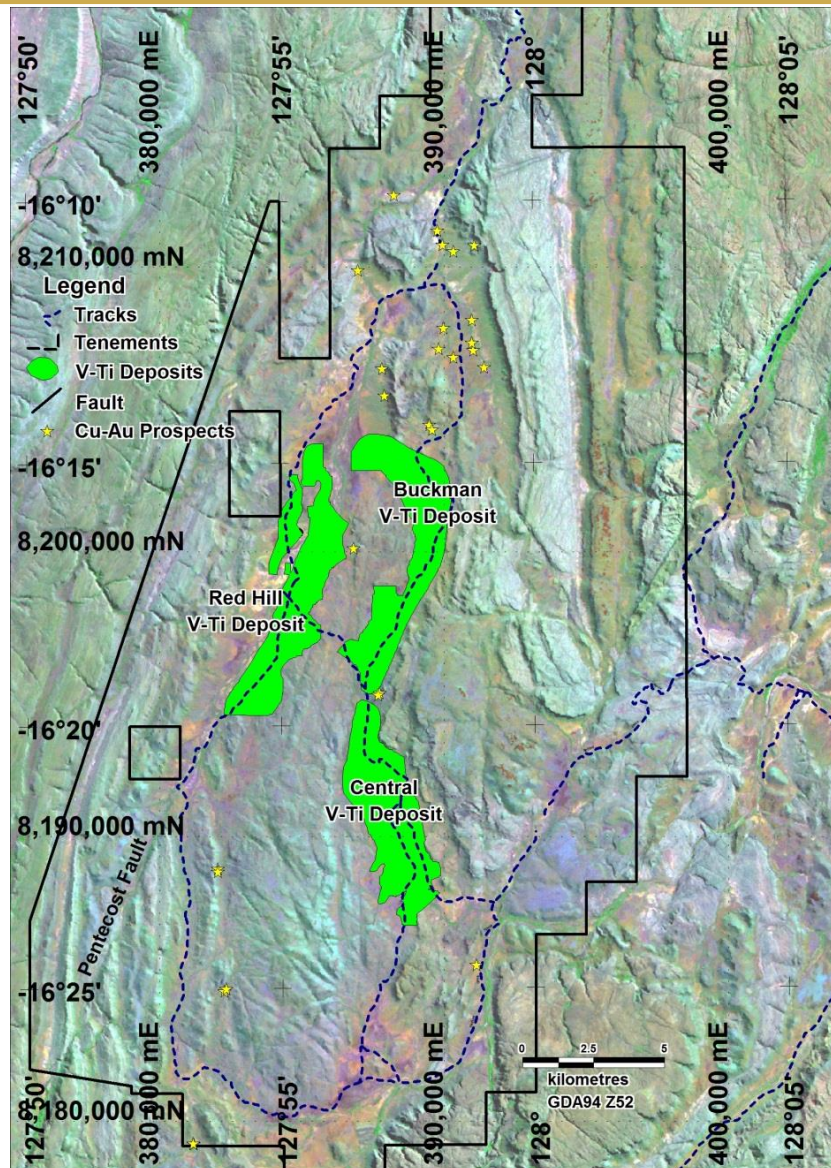
# Vanadium resources in global perspective

**Vanadium Resource Company Peer Comparison**  
**Resource Tonnes and Grade and Concentrate Grade**



Source: Company websites, ASX announcements, Technical Reports and Studies, and metallurgical updates.  
 Tonnes and grade based on reported total resources.  
 Concentrate grade commonly from beneficiation of High Grade zone material.

# Vanadium/Titanium Resources



# 4.7 billion tonne JORC Resource

Vanadium resource estimate updated in accordance with JORC Code (2012) by CSA Global Pty Ltd (refer ASX announcement 26 May 2017).

- Measured, Indicated and Inferred Mineral Resource, reported at a 0.23%  $V_2O_5$  cut-off grade from the Central, Buckman and Red Hill deposits, comprises:

**4,712 million tonnes at 0.3%  $V_2O_5$ , 2% Ti and 14.7% Fe**

- Measured, Indicated and Inferred Mineral Resource, reported at a 0.23%  $V_2O_5$  cut-off grade from the high grade zone of the Central deposit, comprises:

**520 million tonnes at 0.36%  $V_2O_5$ , 2% Ti and 14.8% Fe.**

The largest titanomagnetite hosted vanadium resource in Australia.



Magnetite gabbro outcrop, drill core and photomicrograph (high grade zone Central Vanadium deposit)



# What has changed since 2012 scoping work?



Source: Prophecy Development Corporation (TSX PCY) Presentation 7 March 2018

# What has changed since 2012 scoping work?

## Concentrate specifications:

- ❖ New magnetic separation test work on drill core delivered a positive upgrade to concentrates by assaying **2.11%  $V_2O_5$ , 16.23%  $TiO_2$  and 66.27%  $Fe_2O_3$** <sup>1</sup>, the highest vanadium concentrate grade of all Australian deposits. Advantages of a higher vanadium grade concentrate include:
  - ❖ Less concentrate to transport
  - ❖ Less concentrate to acid leach
- ❖ **Mass yield** increased to **16.58%** with **improved  $V_2O_5$  and  $TiO_2$  recoveries** at a coarser grain size that has **rejected 67% of waste at 0.5mm** with **final concentrate grain size of  $P_{80}$  120 micron** (compared to previous 45 micron)<sup>1</sup>.

## Hydrometallurgical Process

- ❖ New acid leach methods using hydrochloric acid (HCl) to dissolve V, Ti and Fe metals at high leach efficiencies.
- ❖ New thermal hydrolysis and chemical precipitation methods rather than solvent extraction to produce vanadium pentoxide, titanium dioxide and iron oxide (hematite).

## Products Targeted

- ❖ High purity vanadium pentoxide (>99.5%  $V_2O_5$ ), high purity titanium dioxide (99.5%  $TiO_2$ )
- ❖ High value vanadium electrolyte which requires 99.5%+ purity  $V_2O_5$

## Infrastructure, Engineering and Sovereign Risk

- ❖ Compatible infrastructure opportunities emerging nearby
- ❖ Large scale engineering capacity more competitive
- ❖ Greater recognition of Australia as a safer domicile to invest for future production

## Exchange Rate

- ❖ Currency exchange rates have significantly improved

<sup>1</sup> KRC ASX announcement 21 March 2018

# Process Flow Sheet

KRC's Vanadium Concept Study currently underway is examining a process flow sheet that processes high grade vanadium samples from the Central Vanadium deposit (0.37-0.39%  $V_2O_5$ )<sup>1, 2</sup>. Initially a magnetite concentrate grading >2% vanadium pentoxide ( $V_2O_5$ ) is produced by crushing, grinding and magnetic separation methods. The vanadium and titanium enriched concentrate is then leached in hydrochloric acid (at temperatures between 70 and 90 degrees) to release the V, Ti and Fe metals into solution for separation by hydrothermal and chemical precipitation methods. This process is then followed by purification steps to produce high purity vanadium pentoxide ( $V_2O_5$ ), titanium dioxide ( $TiO_2$ ) and iron oxide ( $Fe_2O_3$ ) products.



**High Grade  
Vanadium Pentoxide**  
99.48%  $V_2O_5$  <sup>3</sup>

**High Purity  
Titanium Dioxide**  
99.5%  $TiO_2$  <sup>4</sup>



<sup>1</sup> KRC ASX announcement 21 August 2017

<sup>2</sup> KRC ASX announcement 21 March 2018

<sup>3</sup> KRC ASX announcement 27 February 2018

<sup>4</sup> KRC ASX announcement 30 January 2018



# Important factors that differentiate Speewah

- With the recent vanadium price increase most of the potential value from the Speewah vanadium magnetite-ilmenite concentrate is expected to be from the Vanadium, followed by Titanium and then Iron.
- The very large JORC resources of 4.7 billion tonnes at 0.3%  $V_2O_5$  gives the potential to increase the term and scale of the Scoping Study currently underway.
- Less than 50% of the Measured and Indicated Resources of the Central deposit will form the basis of the planned Scoping Study and no Inferred Resources will be included.
- High purity products must be the focus of new vanadium miners wishing to enter the emerging market for vanadium electrolyte. KRC has focussed on these markets.
- The vanadium (and titanium) grade of concentrate, and the high recovery of acids, will be critical inputs into the Scoping Study evaluation of the acid leach-hydrometallurgical process adopted by KRC.
- Costs of mining at projects vary markedly because of in-situ grade, geometry and zoning of the orebody, waste to ore ratios, and mining methods. The Central vanadium deposit has flat-lying geometry and mostly fresh rock from near surface.

# Concept Study Update

- ❖ KRC is progressing a Concept Study to identify and address the technical hurdles necessary to complete a Scoping Study<sup>1</sup>.
- ❖ Items still being addressed in the Concept Study include:
  - Finalising the Process Flow Sheet (PFS):
    - Optimisation of the  $V_2O_5$ ,  $TiO_2$  and  $Fe_2O_3$  process routes and improving recoveries
    - Optimising hydrochloric acid recovery
    - High-level mass and energy balance
    - Capital and operating cost estimates of processing
  - Beneficiation plant design and cost estimates
  - Open pit optimisation and mining schedule study.
- ❖ TSW Analytical Pty Ltd, Primero Group Pty Ltd and CSA Global Pty Ltd have been appointed to complete this testwork and studies.
- ❖ Once these items have been addressed, KRC will finalise a Scoping Study into the preliminary economics of the Speewah Vanadium Project suitable for release to the market in accordance with the reporting requirements for production targets and forward looking statements.

<sup>1</sup> KRC ASX announcements 10 April 2018 and 12 April 2018

# Corporate Overview

ASX code	KRC
Share price (16/4/2018)	9 cents
Issued shares	1.171 billion
ASX Options (exc.10 cents 30/6/18)	124 million
Unlisted Options	5.55 million
Market capitalisation	~ \$105 million
Cash (31 March 2018)	\$1,549,000

Board of Directors
Anthony Barton – Chairman
Greg MacMillan – Non-Executive Director
Leonid Charucky – Non-Executive Director



Top Shareholders	Interest
Anthony Barton & Associates	14.17%

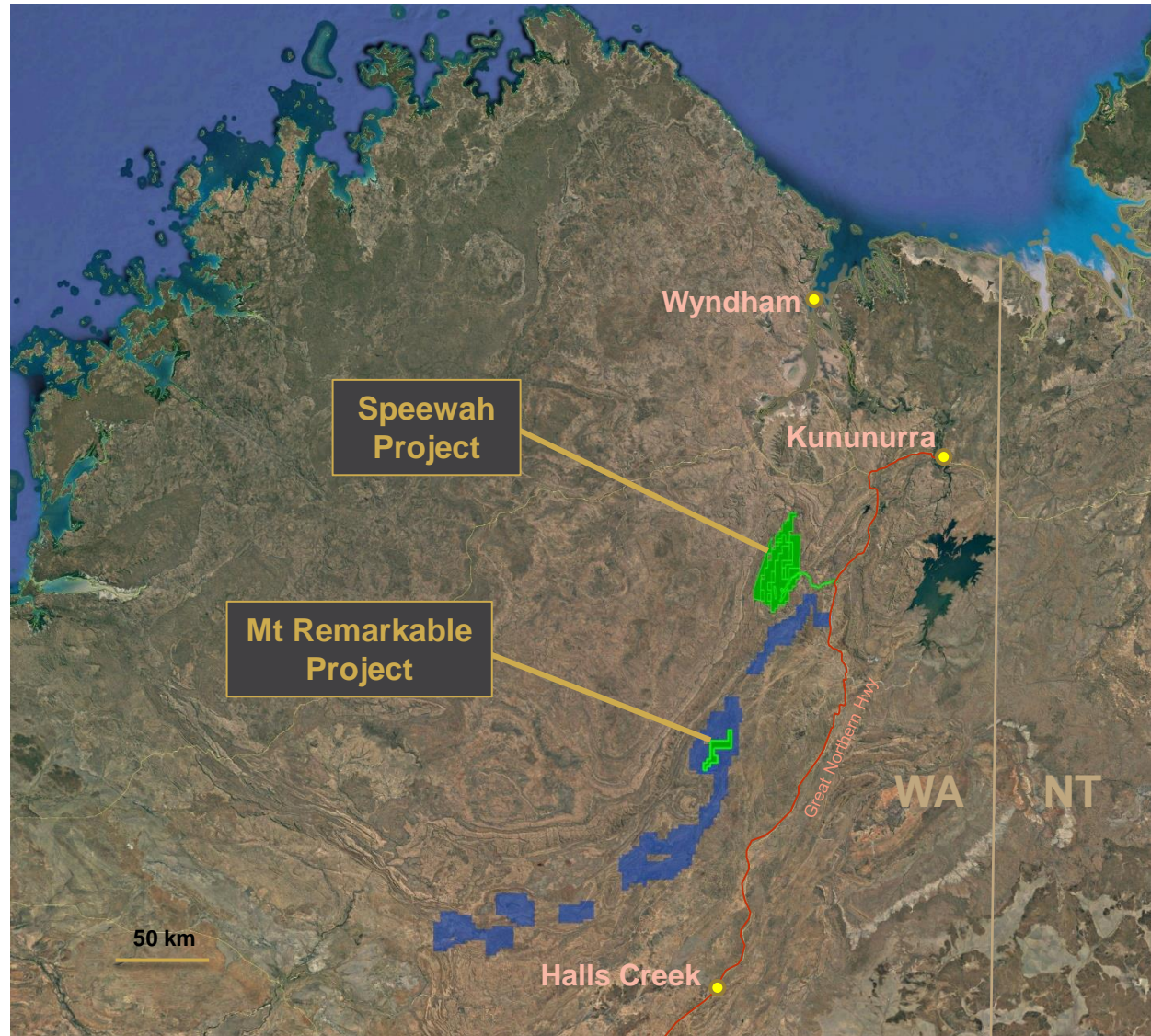
# King River Copper Project Locations



## Western Australian Tenements

### The Kimberley

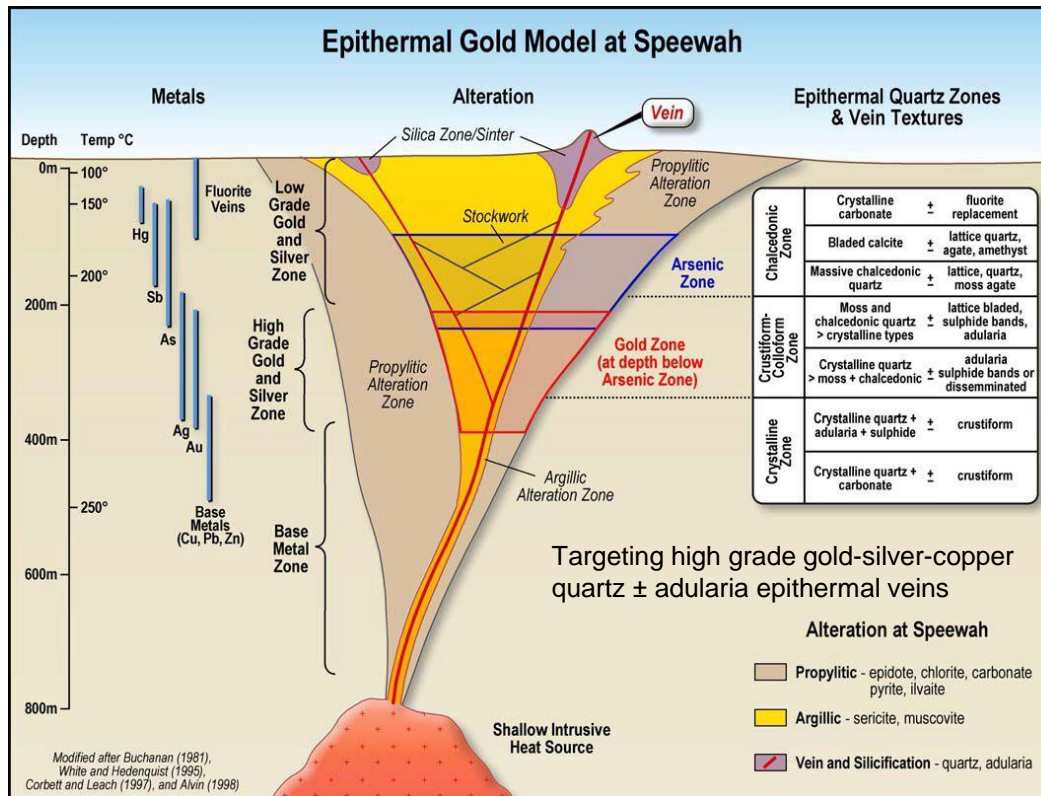
- **Speewah:**  
*Vanadium, Fluorite, Gold, Copper*
- **Mt Remarkable:**  
*Gold*



Google satellite image  
showing locations of  
KRC projects



# Geological Model Speewah and Mt Remarkable

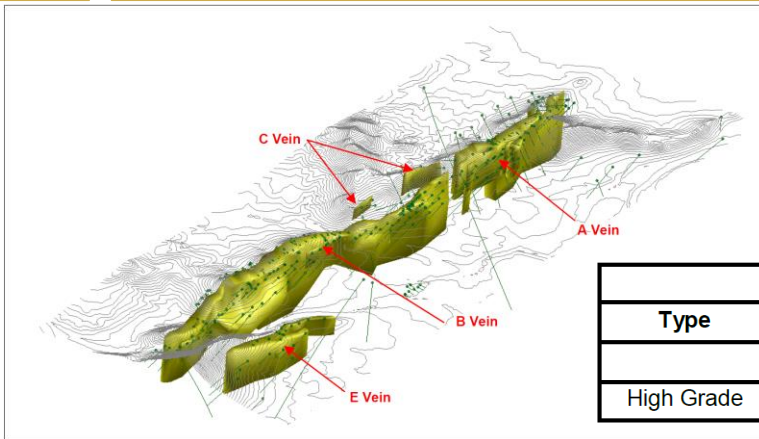




# Current strategy

Q2 2018	Gold drilling Mt Remarkable Concept and Scoping studies
Q3 2018	Advance discussions with potential joint venture parties on completion of the Scoping Study Whitewater Volcanics regional exploration and drilling
Q4 2018	2 deep diamond holes under copper/gold targets at Speewah
	Whitewater Volcanics regional exploration and drilling  Tennant Creek drilling of some high priority targets

# Mineral Resource Estimates



## FLUORITE

Massive fluorite core

Note: Fluorite Resources estimated under JORC 2012<sup>1</sup>

**Table 1: Fluorite Mineral Resource estimate (10% CaF<sub>2</sub> cut-off grade)**

Type	Indicated		Inferred		Total		
	Tonnes	CaF <sub>2</sub> %	Tonnes	CaF <sub>2</sub> %	Tonnes	CaF <sub>2</sub> %	CaF <sub>2</sub> Mt
High Grade	4.1	25.3	2.6	23.6	6.7	24.6	1.7

Zone	JORC Classification	Tonnage (Mt)	V (%)	V <sub>2</sub> O <sub>5</sub> (%)	Fe (%)	Ti (%)
High Grade	Measured	181	0.21	0.37	15.1	2.1
	Indicated	404	0.20	0.35	15.0	2.0
	Inferred	1,139	0.19	0.34	14.9	2.0
Total High Grade		1,725	0.20	0.35	15.0	2.0
Low Grade	Measured	141	0.15	0.27	14.6	2.0
	Indicated	650	0.15	0.27	14.5	1.9
	Inferred	2,196	0.15	0.27	14.4	1.9
Total Low Grade		2,987	0.15	0.27	14.5	1.9
Combined Zones	Measured	322	0.18	0.32	14.9	2.0
	Indicated	1,054	0.18	0.33	14.9	2.0
	Inferred	3,335	0.16	0.29	14.6	2.0
Grand Total		4,712	0.17	0.30	14.7	2.0

## VANADIUM-TITANIUM

Note: Vanadium Resources estimated under JORC 2012<sup>2</sup>

**Table 2: Speewah Project Global Mineral Resource estimate (0.23% V<sub>2</sub>O<sub>5</sub> cut-off grade)**

Zone	JORC Classification	Tonnage (Mt)	V (%)	V <sub>2</sub> O <sub>5</sub> (%)	Fe (%)	Ti (%)
High Grade	Measured	139	0.21	0.37	15.1	2.1
	Indicated	135	0.21	0.37	14.8	2.0
	Inferred	247	0.20	0.36	14.7	2.0
Total High Grade		520	0.20	0.36	14.8	2.0
Low Grade	Measured	91	0.15	0.26	14.6	2.0
	Indicated	167	0.15	0.27	14.8	2.0
	Inferred	462	0.15	0.27	14.3	1.9
Total Low Grade		720	0.15	0.27	14.5	2.0
Combined Zones	Measured	230	0.18	0.33	14.9	2.0
	Indicated	301	0.17	0.31	14.8	2.0
	Inferred	709	0.17	0.30	14.5	2.0
Grand Total		1,240	0.17	0.31	14.6	2.0

**Table 3: Central Mineral Resource estimate 0.23% V<sub>2</sub>O<sub>5</sub> cut-off grade**

<sup>1</sup> KRC ASX announcement 23 February 2018

<sup>2</sup> KRC ASX announcement 26 May 2017

# IMPORTANT NOTICES

## **Note 1:** Competent Persons Statement

The information in this report that relates to Exploration Results, Mineral Resources and Metallurgical Results is based on information compiled by Ken Rogers and Andrew Chapman and fairly represents this information. Mr. Rogers is the Chief Geologist and an employee of the Company, and a member of both the Australian Institute of Geoscientists (AIG) and The Institute of Materials Minerals and Mining (IMMM), and a Chartered Engineer of the IMMM. Mr. Chapman is a Consulting Geologist contracted with the Company and a member of the Australian Institute of Geoscientists (AIG). Mr. Rogers has sufficient experience of relevance to the styles of mineralisation and the 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. Mr Chapman and Mr. Rogers consent to the inclusion in this report of the matters based on information in the form and context in which it appears.

## **Note 2:** Resource Statements

The information in this Report that relates to Mineral Resources is based on previous KRC ASX announcements: The Fluorite Resources reported in Table1 in the previous slide has been sourced from a Resource Estimate Report which was reported in KRC ASX announcement dated 23 February 2018. These Fluorite Resources were estimated in terms of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' (JORC Code 2012 Edition). The Vanadium Resources reported in Tables 2 and 3 in the previous slide has been sourced from a Resource Estimate Report which was reported in KRC ASX announcement dated 26 May 2017. These Vanadium Resources were estimated in terms of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' (JORC Code 2012 Edition).

KRC confirms it is not aware of any new information or data that materially affects the information included in these resource announcements and confirms that all material assumptions and technical parameters underpinning the estimates continue to apply and have not materially changed.

## **Note 3:** Disclaimer

This presentation contains forward looking statements concerning the projects owned by KRC. Statements concerning mineral resources may also be deemed to be forward looking statements in that they involve elements based on specific assumptions. Forward looking statements are not statements of historical fact, and actual events or results may differ materially from those described in the forward looking statements as a result of a variety of risks, uncertainties and other factors. Forward looking statements are based on KRC's beliefs, opinions and estimates as of the date they are made and no obligation is assumed to update forward looking statements if these beliefs, opinions and estimates should change or reflect other future developments. The interpretations and conclusions reached in this presentation are based on current geological theory and the best evidence available to the authors at the time of writing. It is the nature of all scientific conclusions that they are founded on an assessment of probabilities and, however high these probabilities might be, they make no claim for complete certainty. Any economic decisions that might be taken on the basis of interpretations or conclusions contained in this presentation will therefore carry an element of risk.



# THANK YOU

