

# INVESTOR PRESENTATION

## THUNDERBIRD IS GO

BRUCE GRIFFIN  
EXECUTIVE CHAIR

April 2023

ASX: SFX

[www.sheffieldresources.com.au](http://www.sheffieldresources.com.au)



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## Summary information in relation to Sheffield

This document contains summary information about Sheffield Resources Limited (ACN 125 811 083) (**Company** or **Sheffield**), its subsidiaries and their activities which is current as at the date of this document, unless otherwise indicated. The information in this document remains subject to change without notice. The information in this document does not purport to be complete nor does it contain all the information that would be required in a disclosure statement or prospectus prepared in accordance with the Corporations Act 2001 (Cth). This presentation should be read in conjunction with Sheffield's periodic and continuous disclosure announcements lodged with the Australian Securities Exchange (ASX), which are available at <http://www.sheffieldresources.com.au/irm/content/asx-announcements1.aspx?RID=398> or [www.asx.com.au](http://www.asx.com.au), including and in particular "\$30m Share Placement And Entitlement Issue To Advance Sheffield Growth Strategy".

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## Information regarding the South Atlantic Project

All information in this presentation relating to the South Atlantic Project has been sourced from Rio Grande Mineração S/A (RGM). The information in this announcement that relates to the Retiro and Bujuru Exploration Targets is based on information compiled under the guidance of Mr Greg Jones, a Competent Person who is a Fellow of the Australasian Institute of Mining and Metallurgy (AusIMM). Mr Jones is an employee of IHC Mining and 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 Jones consents to the inclusion in the report of the matters based on his information in the form and context in which it appears. This presentation should be read in conjunction with the Company's announcement "\$30m Share Placement And Entitlement Issue To Advance Sheffield Growth Strategy" dated 28 February 2023 which contains relevant exploration results for RGM reported in compliance with the Joint Ore Reserves Committee's Australasian Code for Reporting of Mineral Resources and Ore Reserves (**JORC Code**). Nothing has come to the attention of Sheffield that causes it to question the accuracy or reliability of the information provided by RGM. Nothing in this presentation can be relied on as implying that there has been no change to any information relating to the South Atlantic Project since the date of this presentation, or as a representation as to future matters in relation to RGM and its projects.

## Industry data

Certain market and industry data used in connection with or referenced in this document, including in relation to other companies in Sheffield's peer group, may have been obtained from public filings, research, surveys or studies made or conducted by third parties, including as published in industry-specific or general publications. Neither Sheffield or their respective representatives have independently verified any such market or industry data.

## Compliance Statements

This presentation should be read in conjunction with the following announcements by the Company: "KMS Bankable Feasibility Study Presentation" dated 24 March 2022, "Thunderbird Ore Reserve Update" dated 24 March 2022, "Thunderbird BFS, Results, Financing and Project Update" dated 24 March 2022, "Thunderbird Final Investment Decision" and "Final Investment Decision – Presentation" dated 10 October 2022 and "Mineral Resource and Ore Reserve Statement" dated 24 September 2019 (**the Primary Announcements**). Information in this document in relation to Mineral Resources, Ore Reserves and metallurgy and process design has previously been reported in the Primary Announcements. The Company confirms that it is not aware of any new information or data that materially affects the information included in the relevant market announcements and, in the case of the 24 September 2019 Thunderbird Mineral Resource and Ore Reserve Statement and the 24 March 2022 Thunderbird Ore Reserve Update, that all material assumptions and technical parameters underpinning the estimates with regards to the Company in the relevant market announcement continue to apply and have not materially changed. The Company confirms that all material assumptions underpinning any production target and any forecast financial information derived from any production target that is disclosed in this announcement continue to apply and have not materially changed. The Company confirms that the form and context of the Competent Person's findings are presented and have not been materially modified from the original market announcements.

## Estimates of Mineral Resources and Ore Reserves and Exploration Results

This document and the Primary Announcements contain estimates of Ore Reserves and Mineral Resources and information that relates to exploration results. The Company confirms that all material assumptions underpinning any production target and any forecast financial information derived from any production target that is disclosed in this presentation continue to apply and have not materially changed. The Company confirms that the form and context of the Competent Person's findings are presented and have not been materially modified from the original market announcements. It is a requirement of the ASX Listing Rules that the reporting of ore reserves and mineral resources in Australia comply with the JORC Code. Investors outside Australia should note that while exploration results, mineral resources and ore reserves estimates of Sheffield in this presentation comply with the JORC Code, they may not comply with the relevant guidelines in other countries and, in particular, do not comply with (i) National Instrument 43-101 (Standards of Disclosure for Mineral Projects) of the Canadian Securities Administrators; or (ii) Industry Guide 7, which governs disclosures of mineral reserves in registration statements filed with the US Securities and Exchange Commission (SEC). Information contained in this presentation describing mineral deposits may not be comparable to similar information made public by companies subject to the reporting and disclosure requirements of Canadian or US securities laws.

## Not financial product advice

This document does not constitute, and is not intended to constitute, investment or financial product advice (nor tax, accounting or legal advice). This document should not be relied upon as advice to investors or potential investors and has been prepared without taking account of any person's individual investment objectives, financial situation or particular needs. Any investment decision should be made based solely upon appropriate due diligence. Except to the extent prohibited by law, the Relevant Parties disclaim all liability that may otherwise arise due to any of this information being inaccurate or incomplete. By obtaining this document, the Recipient releases the Relevant Parties from liability to the Recipient for any loss or damage that it may suffer or incur arising directly or indirectly out of or in connection with any use of or reliance on any of this information, whether such liability arises in contract, tort (including negligence) or otherwise.

## Financial data

A number of figures, amounts, percentages, estimates, calculations of value and fractions in this document are subject to the effect of rounding. Accordingly, the actual calculation of these figures may differ from the figures set out in this document. All currency amounts are in Australian Dollars (\$) or A\$) unless otherwise stated.

## Future performance, forward-looking statements and key risks

This document contains certain "forward-looking statements". Forward-looking statements can generally be identified by the use of forward looking words such as "forecast", "likely", "believe", "future", "project", "opinion", "guidance", "should", "could", "target", "propose", "to be", "foresee", "aim", "may", "will", "expect", "intend", "plan", "estimate", "anticipate", "continue", "indicative" and "guidance", and other similar words and expressions, which may include, without limitation, statements regarding plans, strategies and objectives of management, anticipated production dates, expected costs or production outputs for the Company, based on (among other things) its estimates of future production of the Thunderbird Project and the future operation of Sheffield and the Thunderbird Project.

To the extent that this document contains forward-looking information (including forward-looking statements, opinions or estimates), the forward-looking information is subject to a number of risk factors, including those generally associated with the mineral sands industry. Any such forward-looking statement also inherently involves known and unknown risks, uncertainties and other factors that may cause actual results, performance and achievements to be materially greater or less than estimated. These factors may include, but are not limited to, changes in commodity prices, foreign exchange fluctuations, general economic and share market conditions, increased costs and demand for production inputs, the speculative nature of exploration and project development (including the risks of obtaining necessary licenses and permits and diminishing quantities or grades of reserves), changes to the regulatory framework within which the Company operates or may in the future operate, environmental conditions including extreme weather conditions, geological and geotechnical events, and environmental issues, and the recruitment and retention of key personnel.

# CONTENTS

1. Corporate Overview
2. Thunderbird Mineral Sands Project
3. South Atlantic Project
4. Mineral Sands Market



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# SHEFFIELD RESOURCES STRATEGY

Assembling a portfolio of global mineral sands development and production assets to generate cash returns and growth

CORE ASSET	KMS GROWTH	SOUTH ATLANTIC	FUTURE GROWTH
<p>50% interest Thunderbird Mineral Sands Project</p> <ul style="list-style-type: none"> <li>▶ <b>Stage 1 fully funded</b></li> <li>▶ Construction over 75% complete</li> <li>▶ <b>On target</b> for first customer deliveries in Q1 2024</li> <li>▶ Stage 1 NPV<sub>g</sub> \$842m, generating <b>~\$120m pa of cash to Sheffield</b> following debt repayment (mid FY2027 in the base case)<sup>1</sup></li> </ul>	<p>Enhance KMS through</p> <ul style="list-style-type: none"> <li>▶ Thunderbird Stage 2, incremental NPV<sub>g</sub> of <b>\$548m</b><sup>1</sup></li> <li>▶ Additional zones of mineralisation along a 120 km trend</li> <li>▶ East Derby construction sand opportunity</li> </ul>	<p>South Atlantic Option</p> <ul style="list-style-type: none"> <li>▶ Exploration Target ranging between 500 to 720Mt at 3.2 to 4.0% HM<sup>2</sup></li> <li>▶ Exploration Targets comprising sulfate ilmenite and zircon</li> <li>▶ Option Agreement executed with US\$2.5m contribution to fund de-risking activities<sup>3</sup></li> </ul>	<p>Review of other quality mineral sands opportunities</p> <ul style="list-style-type: none"> <li>▶ Targeting advanced projects with potential to unlock value by applying Sheffield's mineral sands and funding experience</li> </ul>

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3. See ASX Announcement "\$30m Share Placement and Entitlement Issue To Advance Sheffield Growth Strategy" dated 28 February 2023.

# CORPORATE OVERVIEW

## CAPITAL STRUCTURE<sup>1</sup>

Item	Unit	Value
Ordinary Shares	#m	393
Share Price	A\$/sh	0.51
<b>Market Capitalisation</b>	<b>A\$m</b>	<b>200</b>
Cash Balance	A\$m	25
Debt Balance	A\$m	-
<b>Enterprise Value</b>	<b>A\$m</b>	<b>175</b>

## SHARE PRICE INFORMATION



1. Data quoted as at 6 April 2023. All other metrics as otherwise denoted.



# MINERAL SANDS MARKET



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# MINERAL SANDS – USED IN EVERYDAY LIFE

## Titanium Minerals

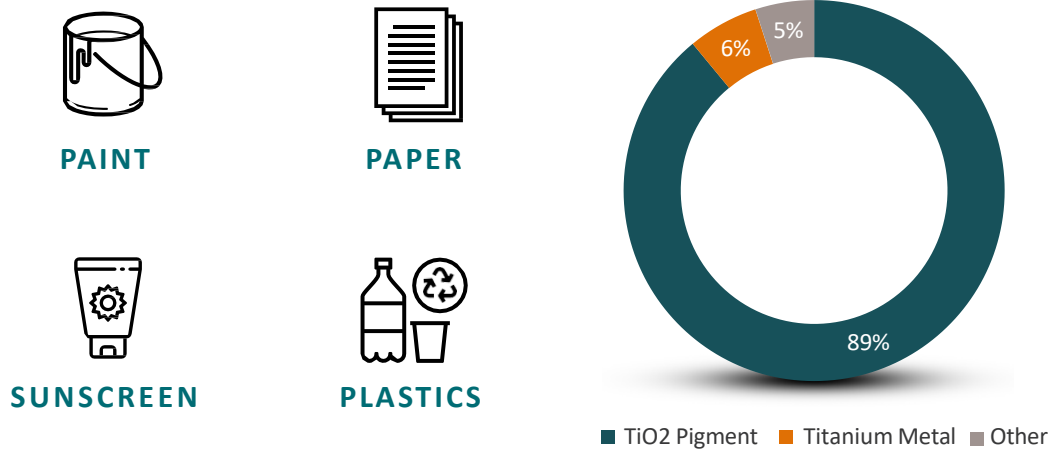
Primary market (90%) is TiO<sub>2</sub> pigment

- ▶ Key applications are paint, plastics and paper
- ▶ Delivers opacity and non-toxic UV protection
- ▶ Smaller quantities of titanium are used in the production of titanium metal and welding



Thunderbird will produce 3.5% of the global Ilmenite supply

### Global TiO<sub>2</sub> market



PAINT



PAPER



SUNSCREEN



PLASTICS

## Zircon

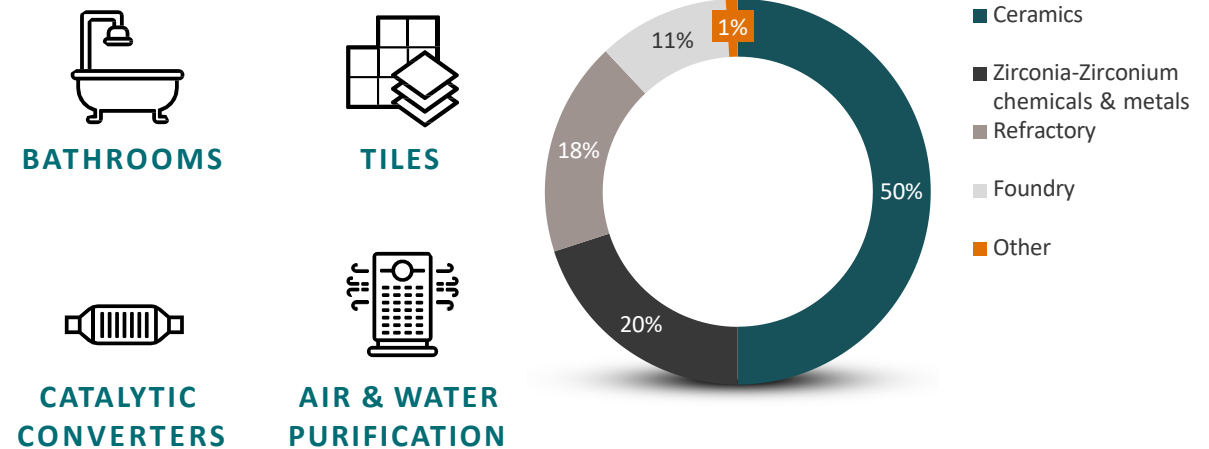
Primary market is ceramics

- Also used in refractories and foundry casting
- Growing use in catalytic converters, and air and water purification



Thunderbird will produce 6.5% of the global Zircon supply

### Global zircon market



BATHROOMS



TILES



CATALYTIC CONVERTERS



AIR & WATER PURIFICATION

# SUPPLY DRIVEN PRICE STRENGTH

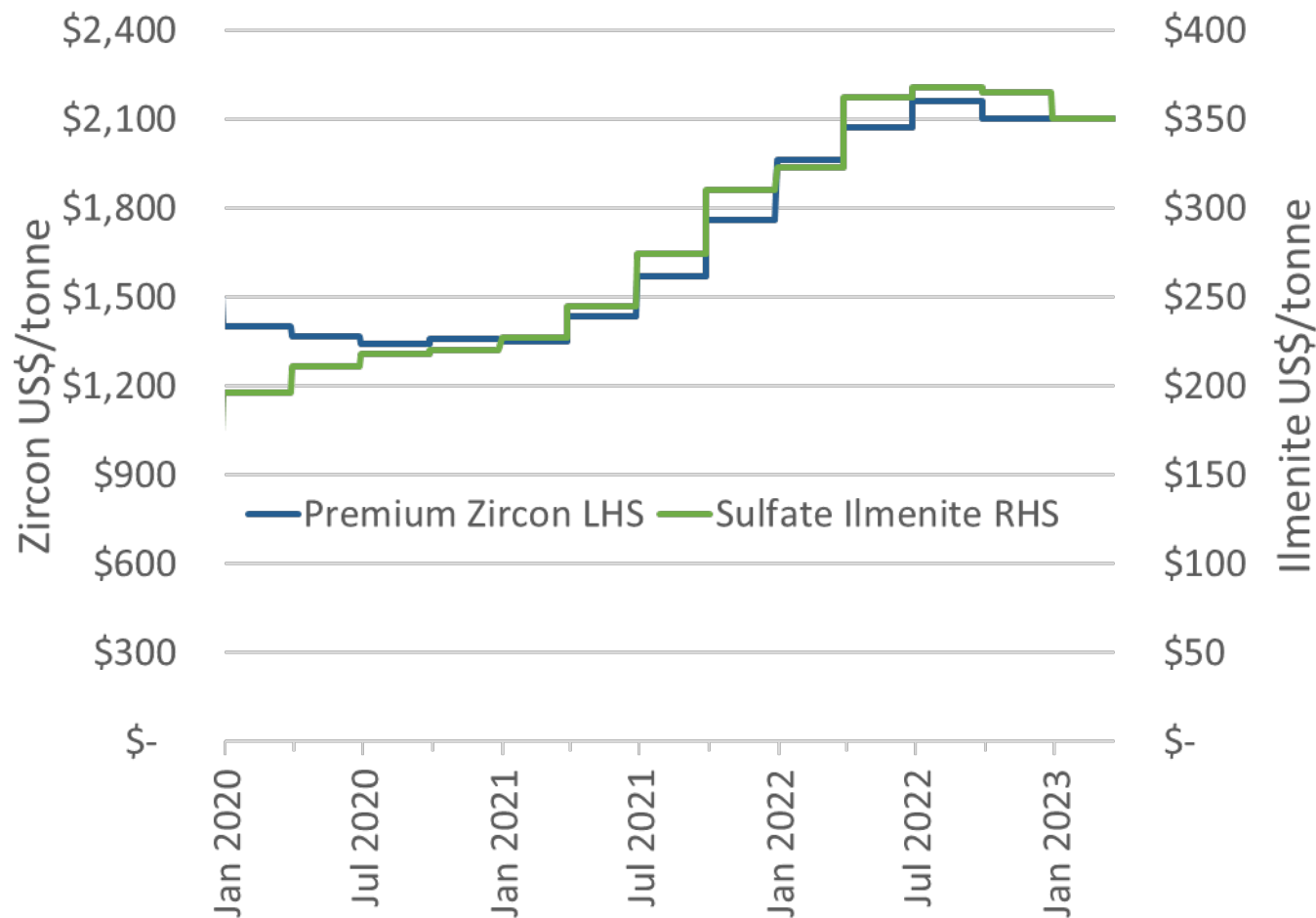
## Premium Zircon

- Current price +/- US\$2100/t
- Prices +/- flat since mid 2022
- Main existing supply sources flat/declining
  - Representing ~ 55% of current supply
- Long term price assumption ~US\$1710/t real

## Sulfate Ilmenite

- Current price +/- US\$350/t
- Prices +/- flat since mid 2022
- Long term price assumption ~US\$226/t real

Product Prices (nominal)<sup>1</sup>





# THUNDERBIRD

## MINERAL SANDS PROJECT

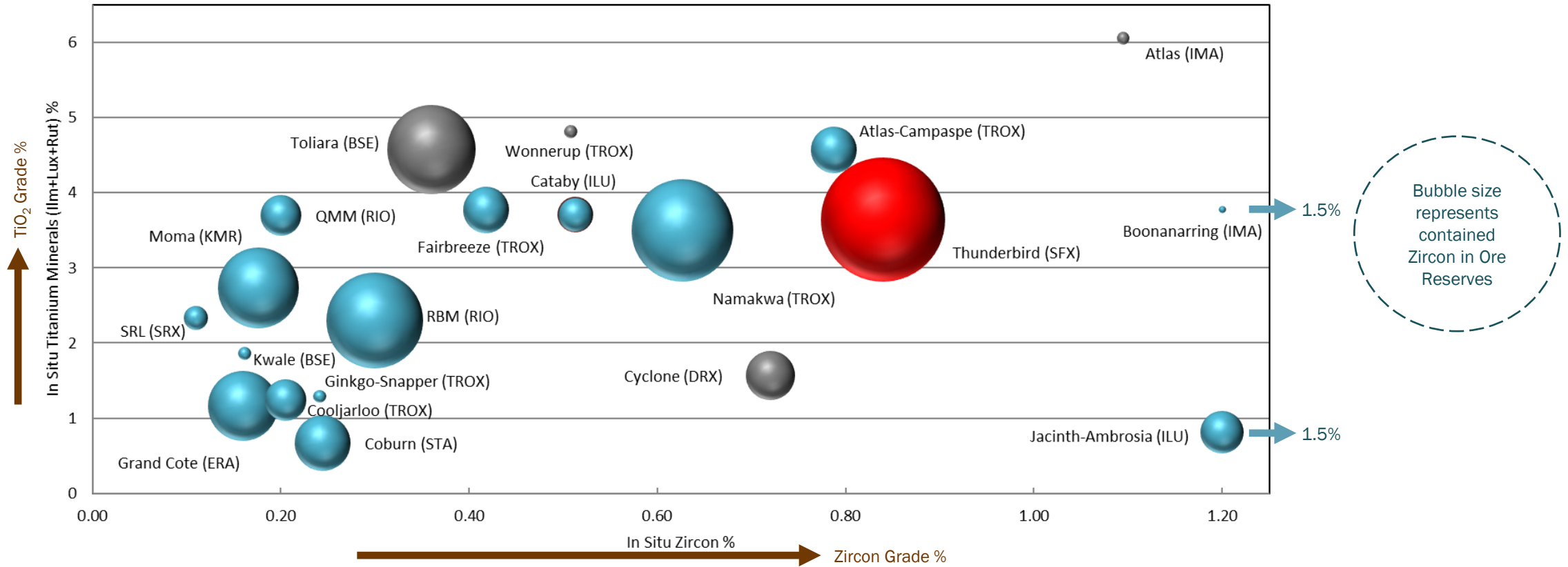


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# THUNDERBIRD – THE WORLD’S LARGEST ZIRCON RESERVES ... IN A LOW RISK JURISDICTION

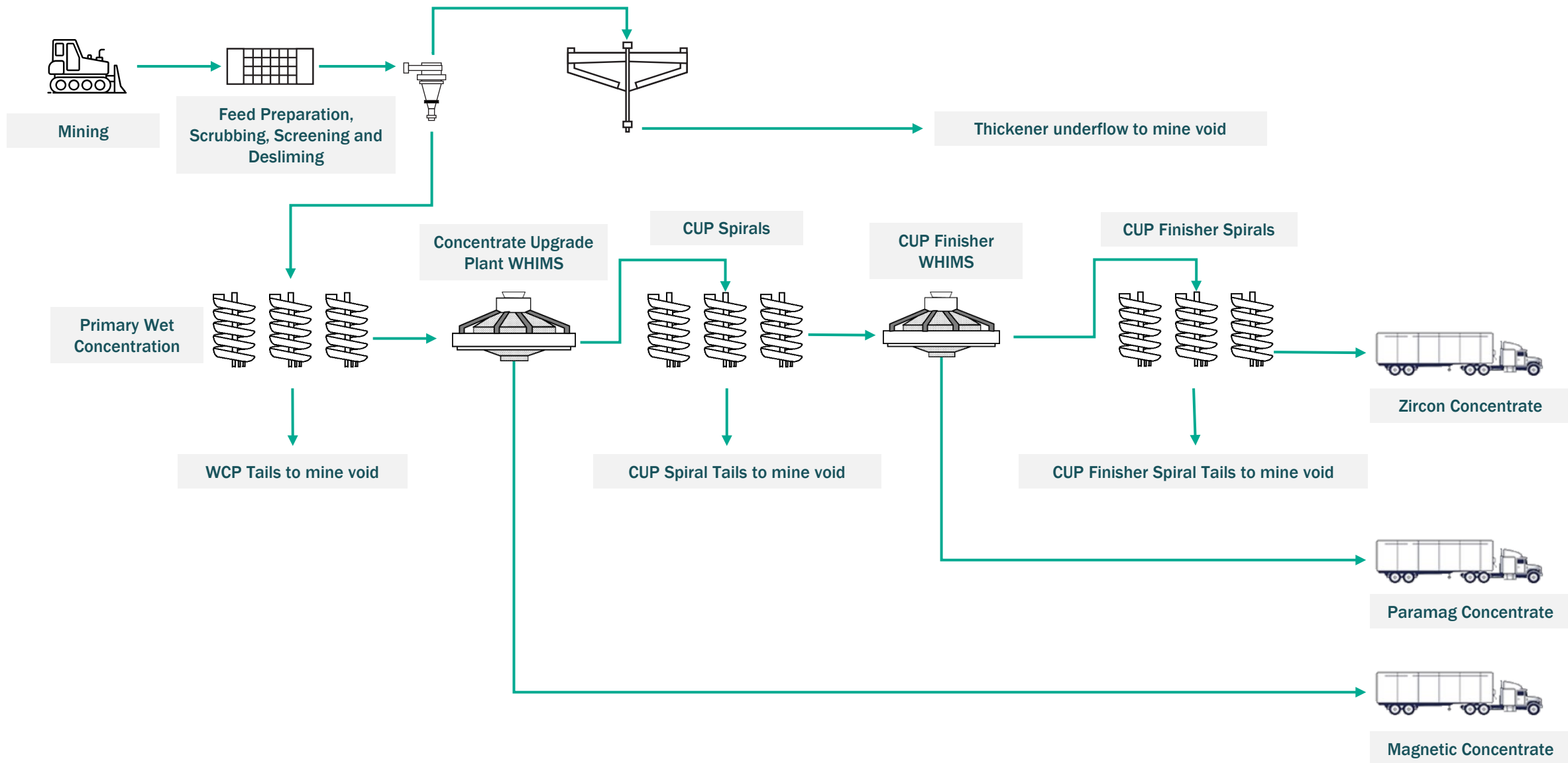
## CONTAINED ZIRCON IN ORE RESERVES AND GRADE FOR SELECTED MINERAL SANDS DEPOSITS 1,2,3



Bubble size represents contained Zircon in Ore Reserves

Note:  
 1. Thunderbird Ore Reserve as published on the ASX on 24 March 2022. Thunderbird Ore Reserves ranked against latest published Ore Reserves of current mineral sands operations and projects under investigation globally. Accordingly, for the operating projects, no account is made for any volumes of product already produced  
 2. Blue bubbles are operating mines, grey bubbles are Ore Reserves reported but the project is not operating  
 3. Data compiled by Sheffield from public sources, refer to Page 31 in the Appendices . This analysis does not illustrate the variance in product value between rutile, leucosene and ilmenite

# SIMPLE FLOWSHEET PRODUCING CONCENTRATES



# LEVERAGING YANSTEEL DOWNSTREAM CAPABILITY

- Thunderbird is a 50/50 JV with Yansteel, part of Tangshan Yanshan Iron & Steel, a privately owned Chinese steel manufacturer
- Construction of Yansteel's vertically integrated smelter/pigment complex in China completed
- Start up underway
- Yansteel designed the plant to process ilmenite feedstock from various global sources including Australia (Thunderbird)
- Feed preparation plant (FPP) includes fluidised bed roasters and magnetic separation



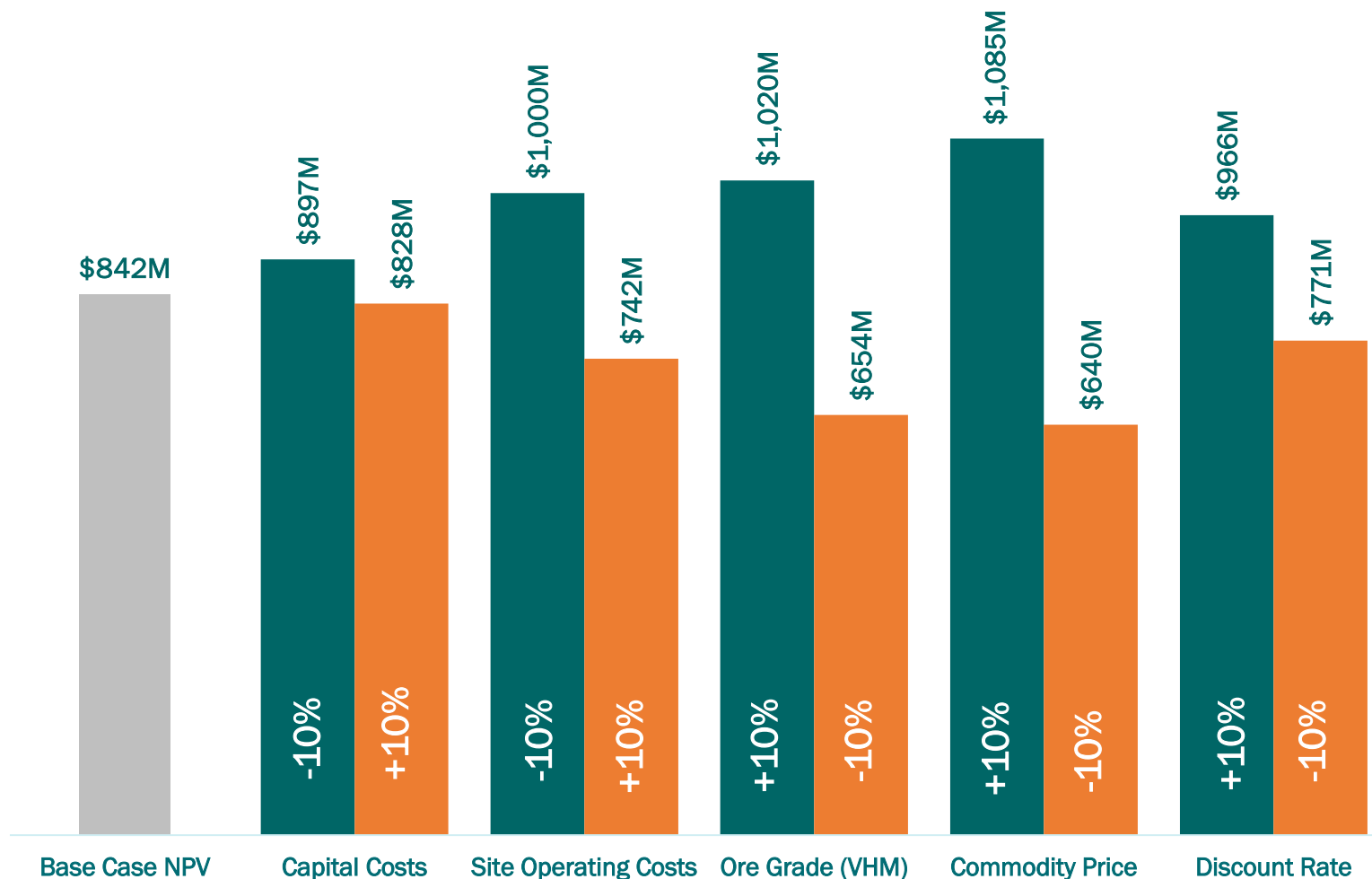
**Process Plant**  
Source: Yansteel



**Tank Farm**  
Source: Yansteel

# COMPELLING STAGE 1 ECONOMICS

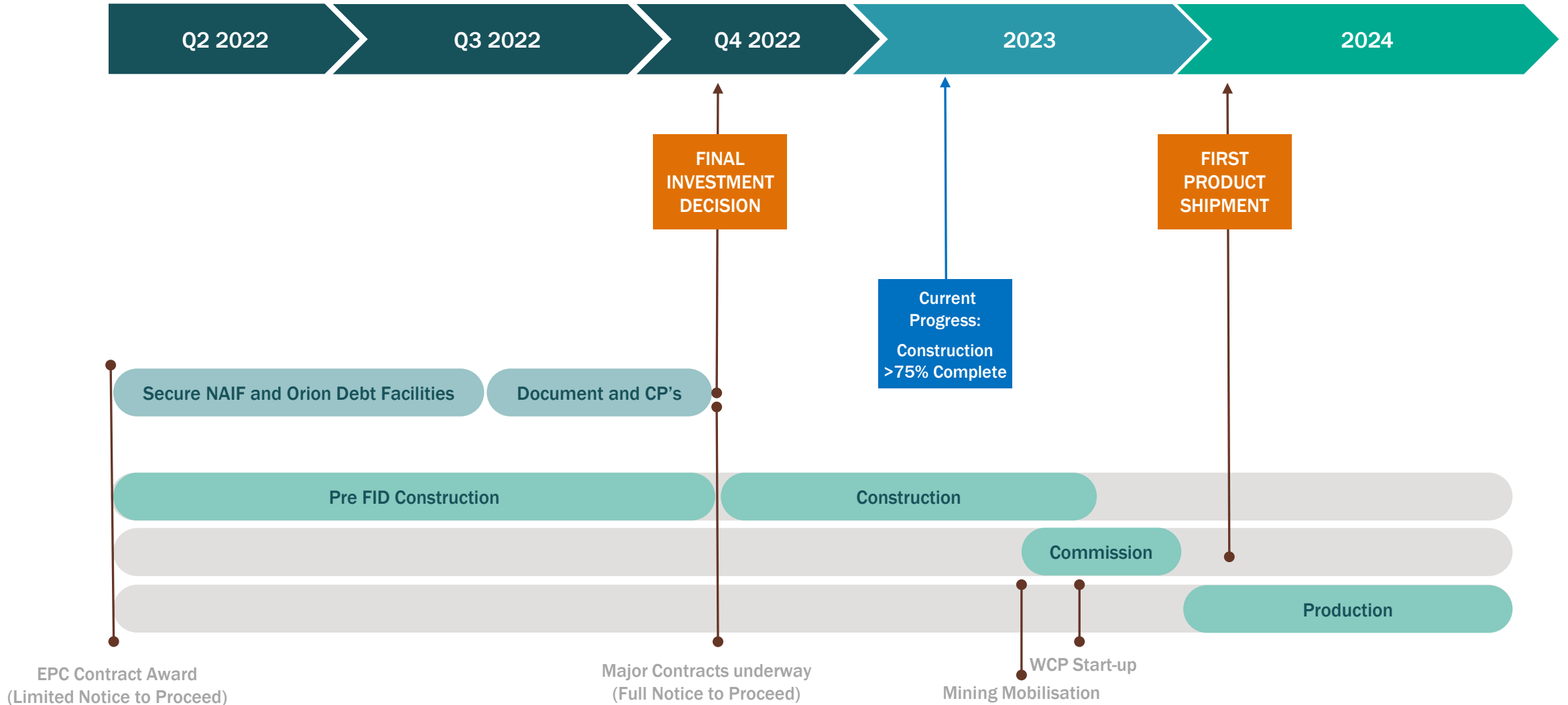
Metric	Stage 1 <sup>1</sup>
NPV <sub>8</sub> post-tax	A\$842m
IRR post-tax	26.6%
Revenue to Cost Ratio (first 10 yrs)	2.3
Project Capital	A\$379m
Total Funding Requirement	A\$484m
Process rate (tonnes p/hour)	1,085
Production (kt pa all products) <sup>2</sup>	913
Mine Life	33 years
LT Average FX (A\$/US\$) <sup>3</sup>	0.75
Long Term Zircon Price – FOB (TZMI) <sup>4</sup>	US\$1,607



Reference:

1. ASX Announcement: "Thunderbird Final Investment Decision" 7 October 2022 and "Thunderbird BFS Results, Financing And Project Update" dated 24 March 2022
2. Annual average Life of Mine production
3. 2022 FID assumes 0.71:1.00 AUD:USD for 2023, increasing to 0.75:1.00 by 2025
4. 2022 BFS real 2020, 2022 FID real 2021

# FIRST PRODUCTS SHIPPED IN Q1 2024



# THUNDERBIRD PROCESS PLANT - MARCH 2023 PROGRESS



## STAGE 2 ADDS SIGNIFICANT VALUE

- Double mining capacity
- 50% increase in final products
- Mine life increased from 33 to 36 years – all from existing reserves
- Capex \$258m (2022 real)
- Post Tax NPV<sub>g</sub> A\$548m (\$274m SFX 50% share)<sup>1</sup>
- Post Tax IRR 27%<sup>1</sup>
- March 2022 BFS assumed execution in 2026/27 with production in 2028
- Scope and timing to be optimized post Stage 1 start up



Reference:

1. ASX Announcement: "Thunderbird Final Investment Decision" 7 October 2022 and "Thunderbird BFS Results, Financing And Project Update" dated 24 March 2022





# OUR ESG APPROACH

## Environmental

- ▶ **Full State and Federal environmental approvals** granted following a detailed Public Environmental Review ("PER") process
- ▶ **Rehabilitation throughout mine life** – minimises disturbed area
- ▶ Environmental practices & protocols mirror Equator Principles - **Addressing the Climate Change challenge**

## Social

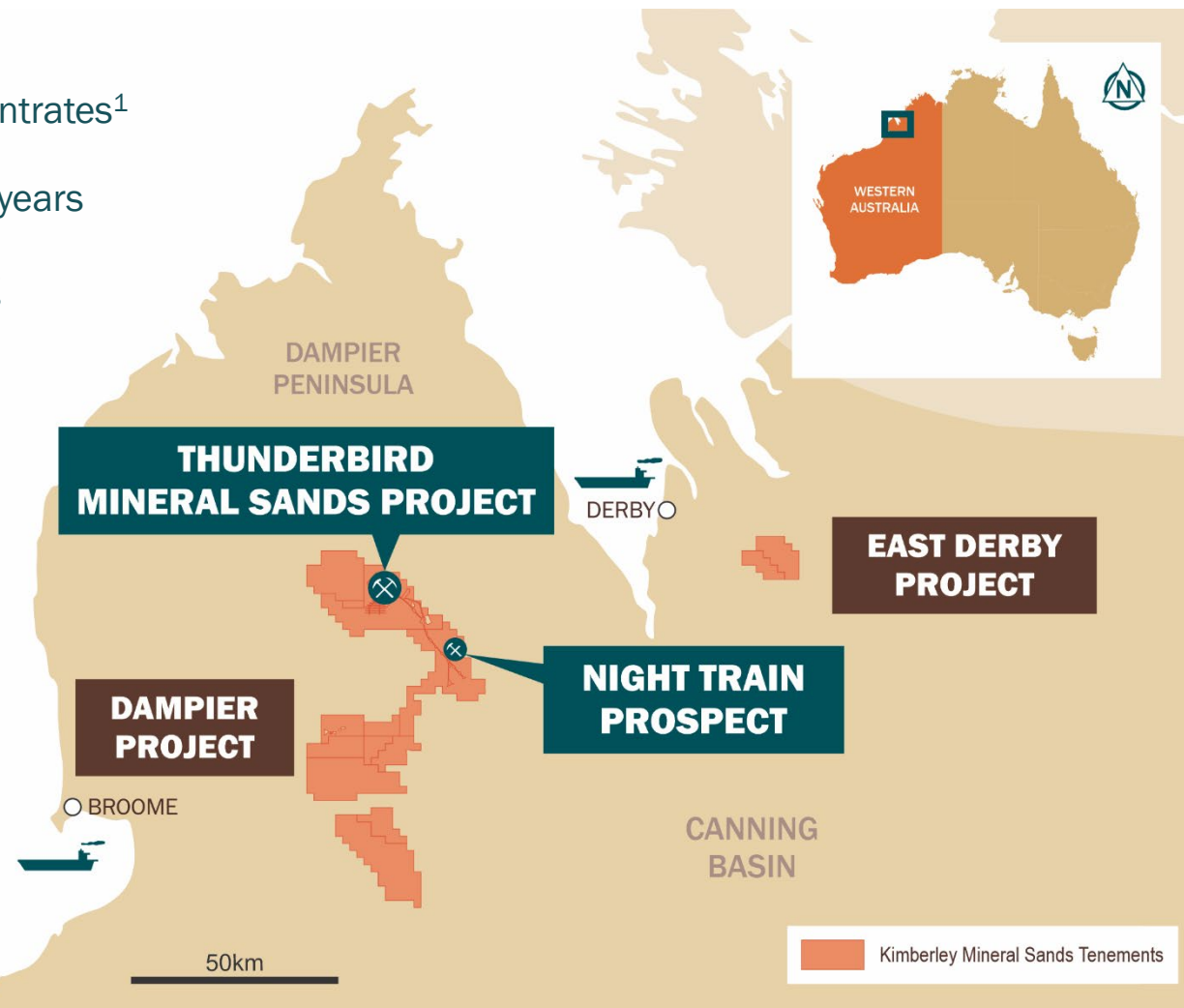
- ▶ **Co-existence Agreement (Native Title Agreement) in place**
  - ▶ Targeted 40% Aboriginal Employment by year 8 of operations
  - ▶ Includes Aboriginal Training Fund & Business Support programs
  - ▶ Cash royalties to Traditional Owners across a 36 year mine life
- ▶ **High standards in safeguarding the environment, water, diversity and Aboriginal heritage**
- ▶ **Focus on Local Employment** – 300 jobs on a Drive In, Drive out basis
- ▶ **State and Federal Tax Contribution of >A\$1B** over 36 year mine life (**100% share**)

## Governance

- ▶ **Sheffield follows the ASX Corporate Governance Council's Corporate Governance Principles and Recommendations (4th Edition)**
- ▶ **Commitment to increase Board and management diversity**

# THUNDERBIRD MINERAL SANDS PROJECT

- 50/50 JV with Yansteel
- World's largest high grade zircon reserve, in a low risk jurisdiction
- Stage 1 Production targeting 1.1mt of zircon and ilmenite rich concentrates<sup>1</sup>
- Offtake agreements in place for ~80% of Stage 1 revenue for first 5 years
- Yansteel plant construction complete, testing prior to commissioning
- Stage 1 fully funded and construction over 75% complete<sup>2</sup>
- SFX trading at deep discount to asset value<sup>3</sup>
  - ▶ Stage 1 Post Tax NPV<sub>8</sub> \$842m (\$421 million SFX 50% share)
  - ▶ Stage 2 Post Tax NPV<sub>8</sub> \$548m (\$274 million SFX 50% share)
  - ▶ Post Tax IRR 26.6%
- First product shipment expected in Q1 2024



Reference:

1. ASX Announcement "Thunderbird BFS Results, Financing and Project Update" 24 March 2022.
2. Project progress as at 28 February 2023.
3. The material assumptions and other matters required by LR 5.16 and 5.17 in respect of this financial forecast based on a production target are set out in the Primary Announcements. The Company confirms that all material assumptions underpinning any production target and any forecast financial information derived from any production target that is disclosed in this presentation continue to apply and have not materially changed. The Company confirms that the form and context of the Competent Person's findings are presented and have not been materially modified from the Primary Announcements.

# SOUTH ATLANTIC PROJECT



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# SOUTH ATLANTIC PROJECT OVERVIEW

- Investing up to US\$2.5 million to earn an **option to acquire a 20% interest** by paying a further US\$12.5 million
- The project is located in the state of **Rio Grande do Sul in Brazil**
- Continuous sequence of dunes and beach sands extending for 80km
- Four continuous deposits; **Retiro, Estreito, Capão do Meio and Bujuru**
- **Exploration target** for Retiro and Bujuru of 500 to 720Mt @ 3.2 to 4.0% HM<sup>1</sup>
- Heavy mineral grades of 3 - 10%, low slimes (<5%) and 2 - 10m thick
- Excellent existing infrastructure; ports, roads, power
- Established industrial area – high quality workforce
- High quality local partner



Reference:

1. See ASX Announcement: "\$30m Share Placement and Entitlement Issue To Advance Sheffield Growth Strategy" of 28 February 2023.

# SUMMARY



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# FULLY FUNDED TO EXECUTE PROPOSED WORK PROGRAM

A\$25m cash balance at end of Q1 2023, with an equivalent forecast & contingent spend across the next 3 years ending CY2025

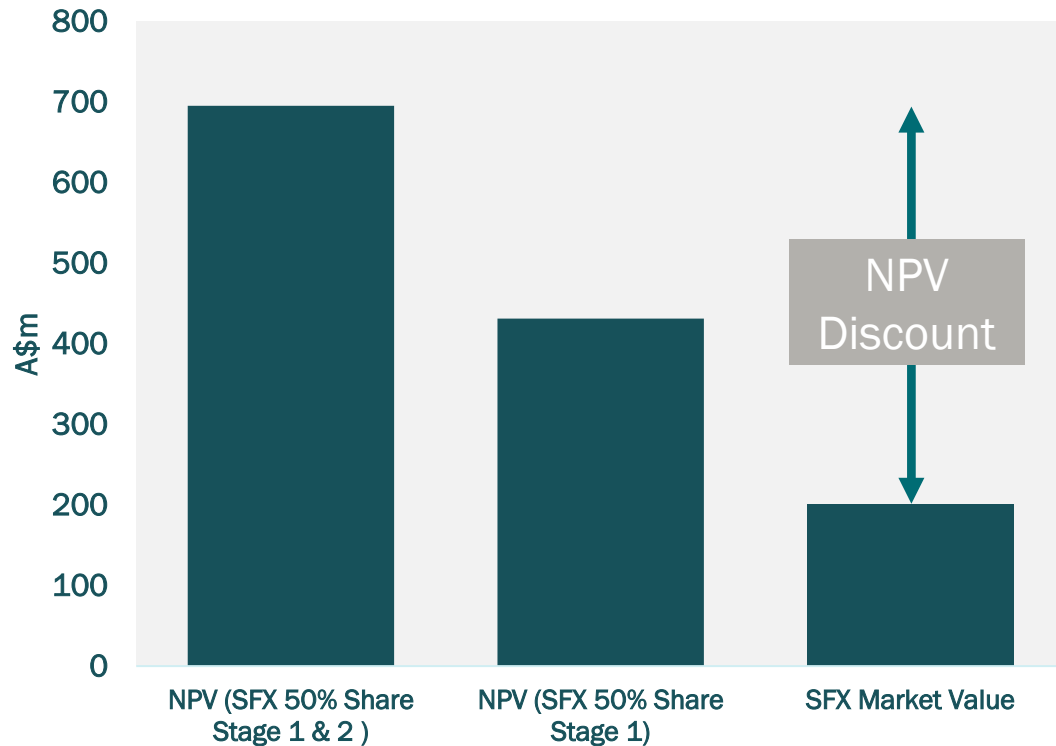


Reference:  
 1. See ASX Announcement: "\$30m Share Placement and Entitlement Issue To Advance Sheffield Growth Strategy" of 28 February 2023 for a more detailed summary of the RGM Option Agreement.  
 2. First payment of \$US1million for South Atlantic Option paid on 10 March 2023

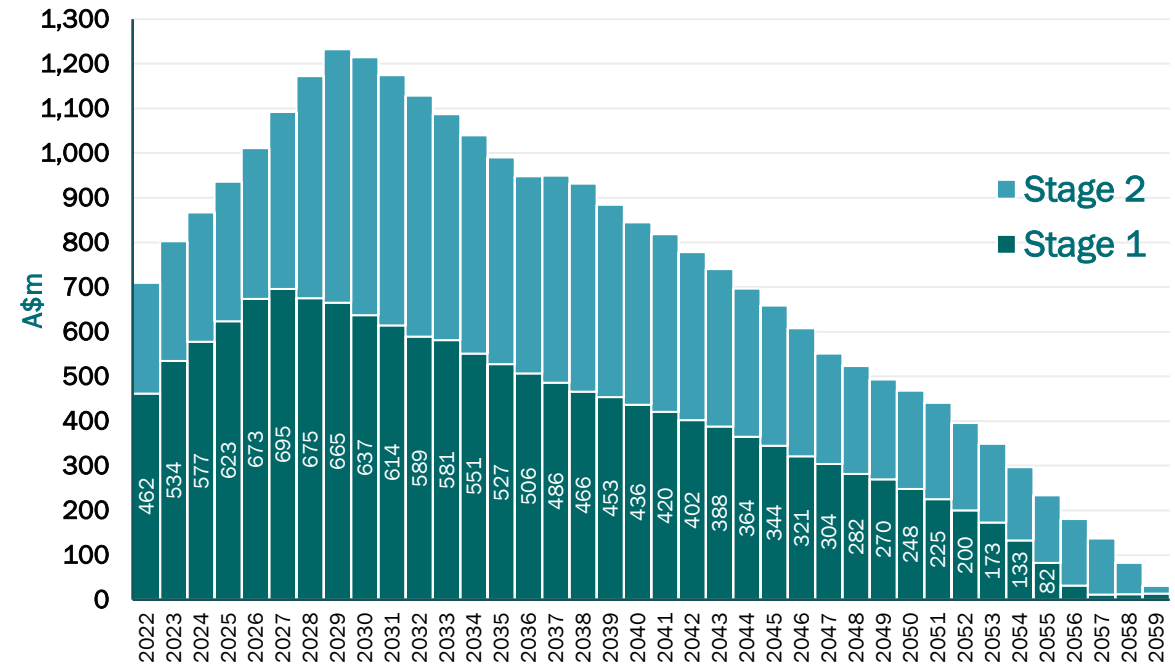
# DEEP DISCOUNT TO ASSET VALUE

>70% discount to Sheffield NPV share of Stage 1&2 and >50% discount to Stage 1 NPV share despite:

- Low risk jurisdiction
- ~12 months to Stage 1 production; >50% construction is complete
- Fully funded with \$484m of capital, in a low risk jurisdiction



NPV of forecast Sheffield cash dividends from KMS peaks at \$1.2B from 2028 to 2031 and remains above \$0.5B until 2048



1. Based upon ASX market price of Sheffield Resources as at 14 November 2022 and sourced from ASX market based data and reports published by Sheffield Resources Limited

# SHEFFIELD RESOURCES

Assembling a portfolio of global mineral sands development and production assets to generate cash returns and growth

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# SHEFFIELD BOARD & MANAGEMENT

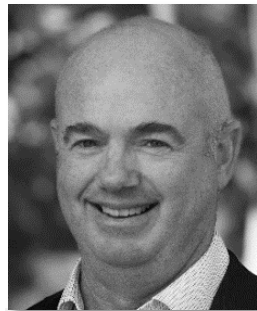


**Bruce Griffin**  
Executive Chair

Bruce was the Senior Vice President Strategic Development of LB Group, one of the world's largest producers of high-quality titanium dioxide pigments.

He was previously Chief Executive Officer of TZ Minerals International Pty Ltd, the leading independent consultant on the global mineral sands industry, World Titanium Resources, a development stage titanium project in Africa and as Vice President Titanium for BHP.

Non-Executive Director of CVW CleanTech Inc and Mawson Gold Limited.

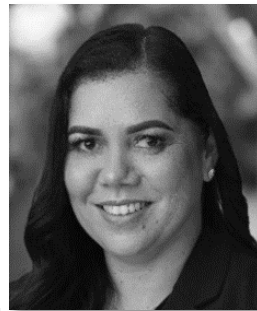


**John Richards**  
Non-Executive Director  
Lead Independent Director

An economist with more than 35 years' experience in the resources industry; holding various positions within mining companies, investment banks and private equity groups.

Mr Richards has held previous positions at Normandy Mining Ltd, Standard Bank, Buka Minerals and Global Natural Resources Investments

Non-Executive Director of Northern Star Resources Limited and Non-Executive Chair of Sandfire Resources Limited.



**Vanessa Kickett**  
Non-Executive Director

Vanessa has extensive experience and involvement with Aboriginal engagement, native title and heritage matters throughout Western Australia.

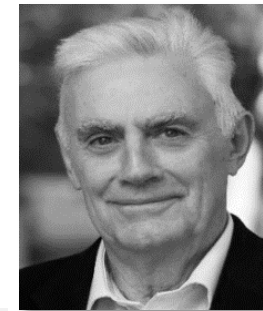
Vanessa is currently Deputy Chief Executive Officer of the South West Aboriginal Land and Sea Council, responsible for the recent implementation and operation of the South West (Western Australia) native title settlement.



**Ian Macliver**  
Non-Executive Director

Ian is the Chairman of Grange Consulting Group Pty Ltd & Grange Capital Partners. Prior to establishing Grange, Ian held positions in various listed and corporate advisory companies with experience covering all areas of corporate activity including capital raisings, acquisitions, divestments, takeovers, business and strategic planning, debt and equity reconstructions, operating projects and financial review and valuations.

Ian is also Non-Executive Chairman of MMA Offshore Limited.



**Gordon Cowe**  
Non-Executive Director

Gordon is a qualified mechanical engineer with over 30 years' experience. He has had significant involvement in leading business start-up, planning and delivery of multiple complex projects including Mining & Mineral Processing, Oil & Gas and Resources based infrastructure projects globally.

Gordon has had an extensive career with leading contractors (including Bechtel, Worley Parsons) and project owners on a wide range of projects.



**Mark Di Silvio**  
Chief Financial Officer &  
Company Secretary

Mark is a qualified CPA and MBA with over 30 years' resources industry experience including operations and project development experience both in Australia and overseas, including project financing, commercial agreement structuring and product offtake agreements

Mark has held senior finance roles with Woodside Petroleum Limited in Australia and Africa prior to his engagement as CFO with Central Petroleum Limited, Centamin Plc and Mawson West Limited.

# APPENDIX: KIMBERLEY MINERAL SANDS

## Kimberley Mineral Sands<sup>1</sup>

- Owns 100% of the Thunderbird Project
- Yansteel (via YGH Australia) contributed A\$130.1m in equity to acquire 50%
- Sheffield retains 50%
- Four person Board with two Yansteel and two Sheffield directors
- Key decisions require unanimous approval of both Yansteel and Sheffield
- Operates as a standalone entity with its own management and employees

## Yansteel

- Yansteel is a wholly-owned subsidiary of Tangshan Yanshan Iron & Steel Co., Ltd (Tangshan)
- Tangshan is a privately owned steel company headquartered in Hebei, China
- Tangshan produces around 10mt per annum of steel products and has annual revenues of ~A\$6bn
- Tangshan is in the process of commissioning a 500ktpa integrated titanium dioxide processing facility
- This complex will consume the magnetic concentrate from Stage 1

## Offtake<sup>2</sup>

- Market price, life of mine, take or pay, for 100% of the Stage 1 magnetic concentrate
- First right of refusal at market price for 100% of magnetic concentrate from subsequent expansions

### Reference:

1. ASX Announcement "Joint Venture Completion and Board Restructure" 12 March 2021
2. ASX Announcement "Transformational Thunderbird Joint Venture" 11 August 2020

# APPENDIX: THUNDERBIRD ORE RESERVES

## THUNDERBIRD ORE RESERVES: VALUABLE HEAVY MINERAL IN-SITU GRADE<sup>1</sup>

Ore Reserve Category	Ore Tonnes (Mt)	In-situ HM Tonnes (Mt)	HM Grade (%)	Valuable Heavy Mineral Grade (In-situ) <sup>2</sup>					
				Zircon (%)	HiTi Leucoxene (%)	Leucoxene (%)	Ilmenite (%)	Oversize (%)	Slimes (%)
Proved	239	31	12.9	0.96	0.29	0.28	3.4	14	16
Probable	514	52	10.1	0.79	0.26	0.27	2.9	11	15
<b>Total</b>	<b>754</b>	<b>83</b>	<b>11.0</b>	<b>0.84</b>	<b>0.27</b>	<b>0.27</b>	<b>3.1</b>	<b>12</b>	<b>15</b>

## THUNDERBIRD ORE RESERVES: MINERAL ASSEMBLAGE AS PERCENTAGE OF HM GRADE<sup>1</sup>

Ore Reserve Category	Ore Tonnes (Mt)	In-situ HM Tonnes (Mt)	HM Grade (%)	Mineral Assemblage <sup>3</sup>					
				Zircon (%)	HiTi Leucoxene (%)	Leucoxene (%)	Ilmenite (%)	Oversize (%)	Slimes (%)
Proved	239	31	12.9	7.5	2.2	2.2	27	14	16
Probable	514	52	10.1	7.8	2.6	2.6	28	11	15
<b>Total</b>	<b>754</b>	<b>83</b>	<b>11.0</b>	<b>7.7</b>	<b>2.4</b>	<b>2.5</b>	<b>28</b>	<b>12</b>	<b>15</b>

Notes:

- Ore Reserves are presented both in terms of in-situ VHM grade, and HM mineral assemblage. Tonnes and grades have been rounded to reflect the relative accuracy and confidence level of the estimate, thus the sum of columns may not equal. Ore Reserves reported for the Dampier Project were prepared and first disclosed under the JORC Code (2012). Refer to Sheffield's ASX Announcement dated 24 March 2022 titled "Thunderbird Ore Reserve Update" for further detail. Ore Reserve is reported to a design overburden surface with appropriate consideration for modifying factors, costs, mineral assemblage, process recoveries and product pricing
- The in-situ grade is determined by multiplying the HM Grade by the percentage of each valuable heavy mineral within the heavy mineral assemblage

# APPENDIX: THUNDERBIRD MINERAL RESOURCES

## THUNDERBIRD MINERAL RESOURCES: VALUABLE HEAVY MINERAL IN-SITU GRADE<sup>1</sup>

Cut-off (HM%)	Mineral Resource Category	Ore Tonnes (Mt)	In-situ HM Tonnes (Mt)	HM Grade <sup>2</sup> (%)	Valuable Heavy Mineral Grade (In-situ) <sup>3</sup>					
					Zircon (%)	HiTi Leucoxene (%)	Leucoxene (%)	Ilmenite (%)	Slimes (%)	Oversize (%)
> 3% HM	Measured	510	45	8.9	0.71	0.20	0.19	2.4	18	12
	Indicated	2,120	140	6.6	0.55	0.18	0.20	1.8	16	9
	Inferred	600	38	6.3	0.53	0.17	0.20	1.7	15	8
	<b>Total</b>	<b>3,230</b>	<b>223</b>	<b>6.9</b>	<b>0.57</b>	<b>0.18</b>	<b>0.20</b>	<b>1.9</b>	<b>16</b>	<b>9</b>
>7.5% HM	Measured	220	32	14.5	1.07	0.31	0.27	3.9	16	15
	Indicated	640	76	11.8	0.90	0.28	0.25	3.3	14	11
	Inferred	180	20	10.8	0.87	0.27	0.26	3.0	13	9
	<b>Total</b>	<b>1,050</b>	<b>127</b>	<b>12.2</b>	<b>0.93</b>	<b>0.28</b>	<b>0.26</b>	<b>3.3</b>	<b>15</b>	<b>11</b>

## THUNDERBIRD MINERAL RESOURCES: MINERAL ASSEMBLAGE AS PERCENTAGE OF HM GRADE<sup>1</sup>

Cut-off (HM%)	Mineral Resource Category	Ore Tonnes (Mt)	In-situ HM Tonnes (Mt)	HM Grade <sup>2</sup> (%)	Mineral Assemblage <sup>4</sup>					
					Zircon (%)	HiTi Leucoxene (%)	Leucoxene (%)	Ilmenite (%)	Slimes (%)	Oversize (%)
> 3% HM	Measured	510	45	8.9	8.0	2.3	2.2	27	18	12
	Indicated	2,120	140	6.6	8.4	2.7	3.1	28	16	9
	Inferred	600	38	6.3	8.4	2.6	3.2	28	15	8
	<b>Total</b>	<b>3,230</b>	<b>223</b>	<b>6.9</b>	<b>8.3</b>	<b>2.6</b>	<b>2.9</b>	<b>28</b>	<b>16</b>	<b>9</b>
>7.5% HM	Measured	220	32	14.5	7.4	2.1	1.9	27	16	15
	Indicated	640	76	11.8	7.6	2.4	2.1	28	14	11
	Inferred	180	20	10.8	8.0	2.5	2.4	28	13	9
	<b>Total</b>	<b>1,050</b>	<b>127</b>	<b>12.2</b>	<b>7.6</b>	<b>2.3</b>	<b>2.1</b>	<b>27</b>	<b>15</b>	<b>11</b>

Notes:

- The Thunderbird Mineral Resources are reported inclusive of (not additional to) Ore Reserves. The Mineral Resource reported above 3% HM cut-off is inclusive of (not additional to) the Mineral Resource reported above 7.5% HM cut-off. All tonnages and grades have been rounded to reflect the relative accuracy and confidence level of the estimate and to maintain consistency throughout the table, therefore the sum of columns may not equal. The Mineral Resource estimate was prepared and first disclosed under the JORC Code (2012). Refer to Sheffield's ASX announcement dated 5 July 2016 titled "Sheffield Doubles Thunderbird Measured Mineral Resource" for further detail
- Total heavy minerals (HM) is within the 38µm to 1mm size fraction and has been reported as a percentage of the total material quantity
- The Valuable HM in-situ grade is reported as a percentage of the total material quantity and is determined by multiplying the percentage of total HM by the percentage of each valuable heavy mineral within the HM assemblage at the resource block model scale
- The Mineral Assemblage is represented as the percentage of HM grade. Estimates of mineral assemblage are determined by screening and magnetic separation. Magnetic fractions were analysed by QEMSCAN for mineral determination as follows: >90% liberation; ilmenite 40-70% TiO<sub>2</sub>; leucoxene 70-94% TiO<sub>2</sub>; high titanium leucoxene (HiTi Leucoxene) >94% TiO<sub>2</sub> and zircon 66.7% ZrO<sub>2</sub>+HfO<sub>2</sub>. The non-magnetic fraction was analysed by XRF and minerals determined as follows: Zircon ZrO<sub>2</sub>+HfO<sub>2</sub>/0.667 and HiTi Leucoxene TiO<sub>2</sub>/0.94

# APPENDIX: NIGHT TRAIN MINERAL RESOURCES

## NIGHT TRAIN MINERAL RESOURCES: VALUABLE HEAVY MINERAL IN-SITU GRADE<sup>1</sup>

Mineral Resource Category	Cut off (HM%)	Ore Tonnes (Mt)	HM Grade (%)	Valuable Heavy Mineral Grade (In-situ) <sup>2,3</sup>					
				Zircon (%)	HiTi Leucoxene & Rutile (%)	Leucoxene (%)	Ilmenite (%)	Slimes (%)	Oversize (%)
Inferred	1.2	130	3.3	0.45	0.18	1.5	0.71	8.7	2.2
Inferred	2.0	50	5.9	0.82	0.33	2.9	1.06	10.2	2.2

## NIGHT TRAIN MINERAL RESOURCES: IN-SITU TONNES<sup>1</sup>

Mineral Resource Category	Cut off (HM%)	HM Tonnes (Mt)	In-situ Tonnes <sup>4</sup>					Total VHM (kt)
			Zircon (kt)	HiTi Leucoxene & Rutile (kt)	Leucoxene (kt)	Ilmenite (kt)		
Inferred	1.2	4.2	560	220	1,900	900	3,590	
Inferred	2.0	3.0	420	170	1,500	540	2,600	

Notes:

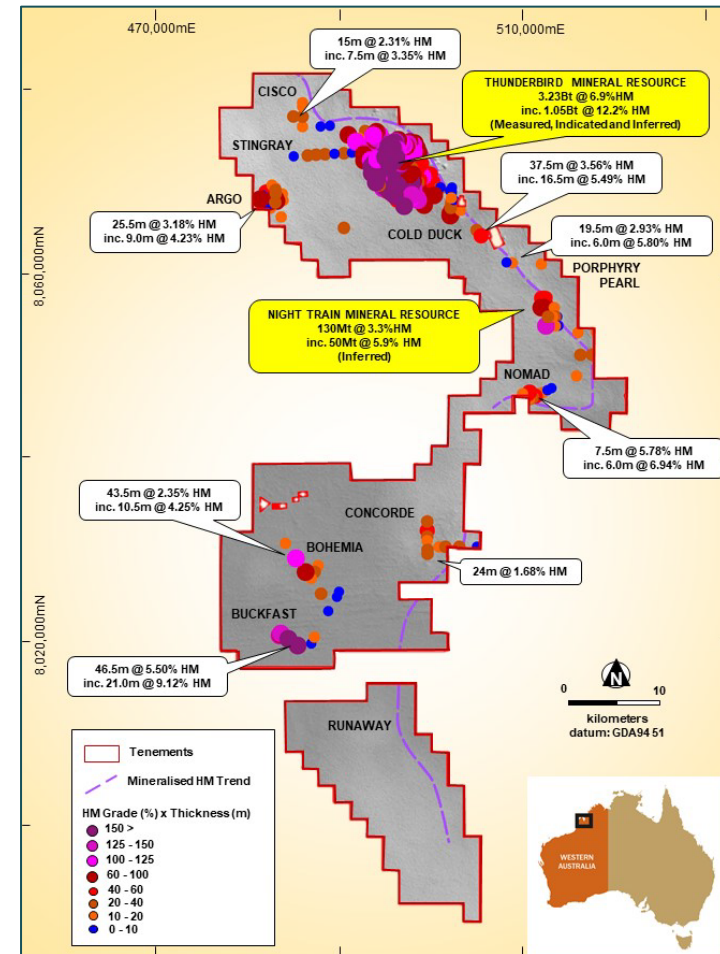
1. Refer to ASX Announcement on 31 January 2019 titled "High Grade Maiden Mineral Resource at Night Train" for further information, explanations and qualifications. The Mineral Resource estimate was prepared by Optiro Pty Ltd and disclosed under the JORC Code (2012). Total HM is within the 38µm to 1mm size fraction and reported as a percentage of the total material, slimes is the -38µm fraction and oversize is the +1mm fraction. Tonnes and grades have been rounded to reflect the relative accuracy and confidence level of the estimate, thus the sum of columns may not equal
2. In-situ assemblage grade is determined by multiplying the percentage of total HM by the percentage of each valuable heavy mineral within the heavy mineral assemblage at the resource block model scale
3. Estimates of Mineral Assemblage are presented as percentages of the Total Heavy Mineral (THM) component of the deposit, as determined by magnetic separation, QEMSCANTM and XRF for one of 12 composite samples. Magnetic fractions were analysed by QEMSCANTM for mineral determination as follows: ilmenite: 40-70% TiO<sub>2</sub> >90% liberation; leucoxene: 70-90% TiO<sub>2</sub> >90% liberation; high titanium leucoxene (HiTi leucoxene) and rutile combined > 90% TiO<sub>2</sub> liberation, and zircon: 66.7% ZrO<sub>2</sub>+HfO<sub>2</sub> >90% liberation. The non-magnetic fraction was submitted for XRF analysis and minerals determined as follows: zircon: ZrO<sub>2</sub>+HfO<sub>2</sub>/0.667 and high titanium leucoxene (HiTi leucoxene): TiO<sub>2</sub>/0.94. HM assemblage determination was by the QEMSCANTM process for 11 of 12 composite samples which uses observed mass and chemistry to classify particles according to their average chemistry, and then report mineral abundance by dominant % mass in particle. For the TiO<sub>2</sub> minerals the following breakpoints were used to distinguish between ilmenite 40% to 70% TiO<sub>2</sub>, leucoxene 70% to 90% TiO<sub>2</sub>, high TiO<sub>2</sub> leucoxene and rutile > 90%
4. The contained in-situ tonnes for the valuable heavy minerals were derived from information from the in-situ grades and tonnes of the Mineral Resource

# APPENDIX: SIGNIFICANT REGIONAL EXPLORATION UPSIDE

## Strategic value demonstrated through multiple discoveries made along a 120km long trend

- Exploration has delineated 14 zones of significant mineralisation along a 120km long highly mineralised trend
- High grade Mineral Resource<sup>1</sup> at Night Train
  - 130Mt @ 3.3% HM, containing 3.6Mt of VHM including 50Mt @ 5.9% HM, containing 2.6Mt of VHM
  - In-situ grades of 0.82% zircon, 0.33% HiTi leucoxene and rutile, 2.9% leucoxene, 1.06% ilmenite
- Three substantial new mineral sands discoveries have been outlined at Buckfast, Bohemia and Concorde
  - Mineral assemblages with high proportions of VHM dominated by leucoxene, altered ilmenite and zircon with low to moderate levels of trash
- Opens up a new 60km long highly prospective corridor south of Thunderbird
- Thick high grade intervals<sup>2</sup> have been intersected, including;
  - 46.5m @ 5.50% HM from 57.0m (NLAC025), including 21.0m @ 9.12% HM from 64.5m (Buckfast)
  - 37.5m @ 5.01% HM from 67.5m (NLAC027), including 25.5m @ 5.74% HM from 75m (Buckfast)
- Numerous zircon-rich targets identified for follow-up drilling

## DAMPIER PROJECT – REGIONAL PLAN<sup>1</sup>



### Notes:

1. Refer to ASX announcement 31 January 2019 titled "High Grade Maiden Mineral Resource at Night Train"

# APPENDIX: ESG – ENVIRONMENT

## All necessary State and Federal environmental approvals received

- Strong social licence to operate is supported by **full State and Federal environmental approvals** following an extensive Public Environmental Review ("PER")
- The PER process required full environmental impact assessment, with **detailed public consultation** and identification of key environmental concerns for the community. The key issues identified were:
  - Impact on the Greater Bilby
  - Impact on ground water resources
  - Haulage of mineral sands products through Derby
  - Impact of ocean going vessels on marine animals
- The **Environmental Protection Authority ("EPA") conducted a detailed review**, including a site visit by the EPA Board and two periods of public comment and consultation
- **All environmental approvals were received** on the following basis:
  - PER standard industry conditions and controls
  - Specific concluded all risks can be adequately managed
  - Approvals contain Greater Bilby management plans in place
  - Environmental offset fund established
  - Restrictions on speeds and travel times for haulage of products
- **Practices to mirror Equator Principles**



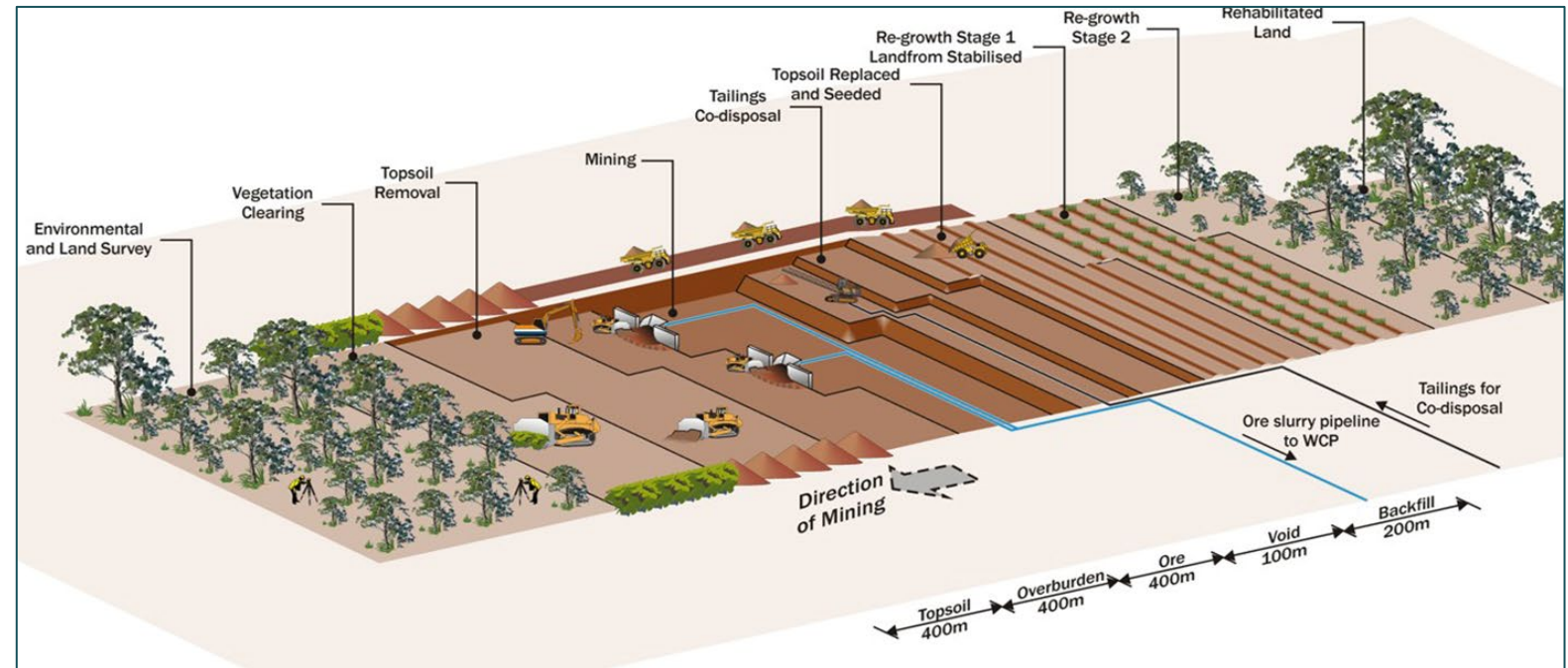
*Thunderbird personnel receive training in Bilby management as part of our Bilby Management Program (2018)*



# APPENDIX: ESG – ENVIRONMENT

## Continuous Rehabilitation

- Proposed dry mining via conventional dozer trap mineral sand mining
- Topsoil and overburden excavated and transported using truck and excavators
- Topsoil is deposited and seeded following completion of mining within each zone
- Active rehabilitation of mined areas occurs continuously throughout the mine life
- Progressive mining limits active mining to a maximum of 16km<sup>2</sup>
- Continuous rehabilitation limits maximum disturbed area during mine life to 60km<sup>2</sup>



# APPENDIX: ESG – ENVIRONMENT

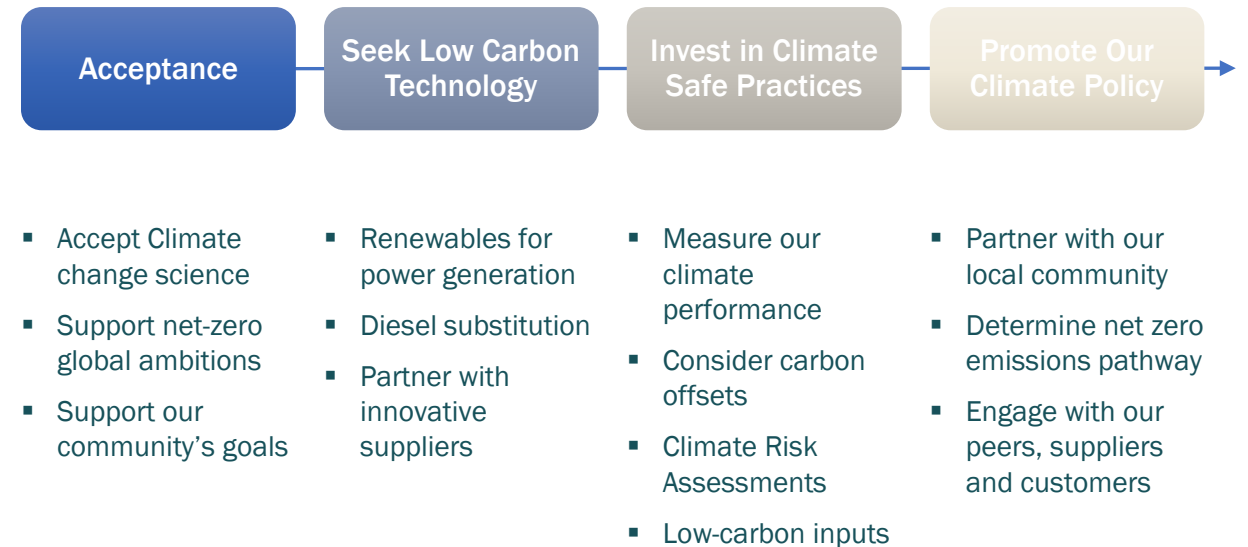
## Embracing the Climate Change challenge

- ▶ CO<sub>2</sub> baseline Scope 1 emissions estimated in BFS 2017 at 11mt CO<sub>2</sub>e (c.40 year life of project)\*
- ▶ Significant reduction expected following removal of Low Temperature Roaster
- ▶ Independent third-party validation of emissions commissioned for 2022 BFS

## CO<sub>2</sub> reduction opportunities across a 36 year mine life

- ✓ Introduction of renewable electricity to complement LNG gas generation
- ✓ BFS assumes Thunderbird village accommodation converted to solar/battery solution of 2MW
- ✓ Innovation within the process plant value chain
- ✓ Logistics at the mine site and to port (e.g. electric fleet solutions)
- ✓ Agree 2030 target and target date for net zero emission

## OUR GOALS FOR A SUSTAINABLE FUTURE



\*Emissions forecast based upon 2017 Public Environmental Review and 2017 (Stage 1 & Stage 2) Bankable Feasibility Study estimates

# APPENDIX: ESG – OUR COMMUNITY STAKEHOLDERS

## ACTIVELY WORKING WITH COMMUNITY STAKEHOLDERS TO CREATE AND MAINTAIN A ROBUST RELATIONSHIP

- ▶ Central to the Kimberley regional strategy is our social licence to operate
  - **Built over ten years** and based on formal and informal community relations practices
- ▶ Strategy focuses on:
  - **Aboriginal engagement** and advancement
  - **Local content employment** and workforce on a **drive-in and drive-out** basis (as opposed to fly-in, fly-out)
  - Low environmental and Aboriginal Heritage impact
  - **Regional economic opportunities** and local business development
- ▶ Community engagement practices to date are **built on strong stakeholder, social and community support for Thunderbird** and ensures a positive foundation for project development, land access, construction and project operation
- ▶ Achieved through **development and implementation of communication and consultation** strategies which ensure stakeholders to the ports, Traditional Owners, pastoralists, local shires, government authorities, local businesses and local communities are informed and engaged positively
- ▶ **Strongly supported by State and Federal Government**, Thunderbird has a 36-year mine life which will see opportunity flow within the Kimberley region for future generations



*Kimberley Mineral Sands community consultations (Broome, 2021)*



# APPENDIX: ESG – NATIVE TITLE AGREEMENT

## NATIVE TITLE AGREEMENT SIGNED AND IS IRREVOCABLY BINDING ON BOTH SHEFFIELD AND THE TRADITIONAL OWNERS

- Signed the Co-existence Agreement (Native Title Agreement) for Thunderbird on 31 October 2018
- The Traditional Owners authorised the Named Applicants to sign the Co-existence Agreement for Thunderbird, making it binding on both the Company and the Traditional Owners
- Details of the Co-existence Agreement are confidential, however the final agreement is in line with the Company’s commitment to the community and contains:
  - Royalty payments to the Traditional Owners across mine life
  - Local and Aboriginal employment and business commitments
  - Protection for Aboriginal heritage and the environment
- The Co-existence Agreement establishes the framework by which the Company can work with the Traditional Owners to protect Aboriginal heritage and the environment while delivering sustainable employment and business outcomes for Traditional Owners and the wider Aboriginal community
- Joombarn-Buru native title claim formally determined by Federal Court in Oct 2021



*Joombarn-Buru native title claim formally determined by Federal Court (Perth, October 2021)*

## ABORIGINAL EMPLOYMENT STRATEGY

- Previous success in building a strong locally based workforce to be replicated during 36 year operation, particularly in the area of Aboriginal employment
- Strong commitment to training and development which results in ongoing employment
- In addition, key strategy targets include:
  - To achieve 40% Aboriginal employment by year 8 of operations
  - To commit to Aboriginal businesses during construction and operations

## ADDITIONAL PEER INFORMATION

Company	Company Material Reference
Kenmare Resources	2020 Annual Report
Strandline Resources	2019 Reserve Statement
Eramet	2021 Universal Filing
Tronox	2022 Annual Report
Diatreme Resources	2016 Reserve Statement
Rio Tinto	2022 Annual Report
Base Resources	2022 Reserve Statement
Iluka Resources	2022 Reserve Statement
Image Resources	March 2023 Boonanarring and December 2022 Atlas Ore Reserve Updates
Sierra Rutile	2022 Reserve Statement