Sheffield Resources LIMITED

Thunderbird

The Emerging Force in Mineral Sands

Investor Presentation

October 2017

ASX : SFX

sheffieldresources.com.au

COMPLIANCE AND DISCLAIMER

PREVIOUSLY REPORTED INFORMATION

This presentation includes information that relates to Exploration Results, Mineral Resources and Ore Reserves prepared and first disclosed under the JORC Code (2012) and a Bankable Feasibility Study. The information was extracted from Sheffield Resources Limited's ACN 125 811 083 ("the Company" or "Sheffield") previous ASX announcements which are available on Sheffield's web site www.sheffieldresources.com.au as follows:

"SHEFFIELD TO IPO CARAWINE GOLD AND BASE METAL ASSETS" 19 October 2017
"SHEFFIELD ANNOUNCES EPC PREFERRED CONTRACTOR" 19 October 2017
"SHEFFIELD MANDATES TAURUS FOR US$200M DEBT FACILITY' 18 October 2017
"THUNDERBIRD NATIVE TITLE UPDATE " 12 October 2017
"EPA RECOMMENDS APPROVAL OF THUNDERBIRD " 9 October 2017
"SHEFFIELD SECURES SECOND BINDING OFFTAKE AGREEMENT " 25 September 2017
" NATIVE TITLE APPEAL DISMISSED" 22 September 2017
"SHEFFIELD SIGNS MAIDEN BINDING OFFTAKE AGREEMENT "12 September 2017
" THUNDERBIRD PERMITTING UPDATE" 30 August 2017
"SHEFFIELD LAUNCHES ABORIGINAL EMPLOYMENT PROGRAM" 17 August 2017
"NATIVE TITLE DETERMINATION " 15 June 2017
"SHEFFIELD SIGNS CORNERSTONE ILMENITE MOU" 29 May 2017
"SHEFFIELD SECURES FURTHER ZIRCON OFFTAKE MOUs" 26 April 2017
"ADDITIONAL ZIRCON OFFTAKE MOU SIGNED" 10 April, 2017
"SHEFFIELD SIGNS OFFTAKE MOUs" 04 April, 2017
"THUNDERBIRD BFS DELIVERS OUTSTANDING RESULTS" 24 March, 2017
"THUNDERBIRD ORE RESERVE UPDATE" 16 March 2017
"THUNDERBIRD ILMENITE EXCEEDS PREMIUM SPECIFICATION" 13 March 2017
"OUTSTANDING IMPROVEMENTS IN RECOVERIES AND PRODUCT SPECIFICATIONS FROM THUNDERBIRD BFS" 12 October 2016

These announcements are available to view on Sheffield's website: www.sheffieldresources.com.au

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 estimates of Mineral Resources, Ore Reserves, Bankable Feasibility Study and other Technical Study results, 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 have not been materially modified from the relevant original market announcements.

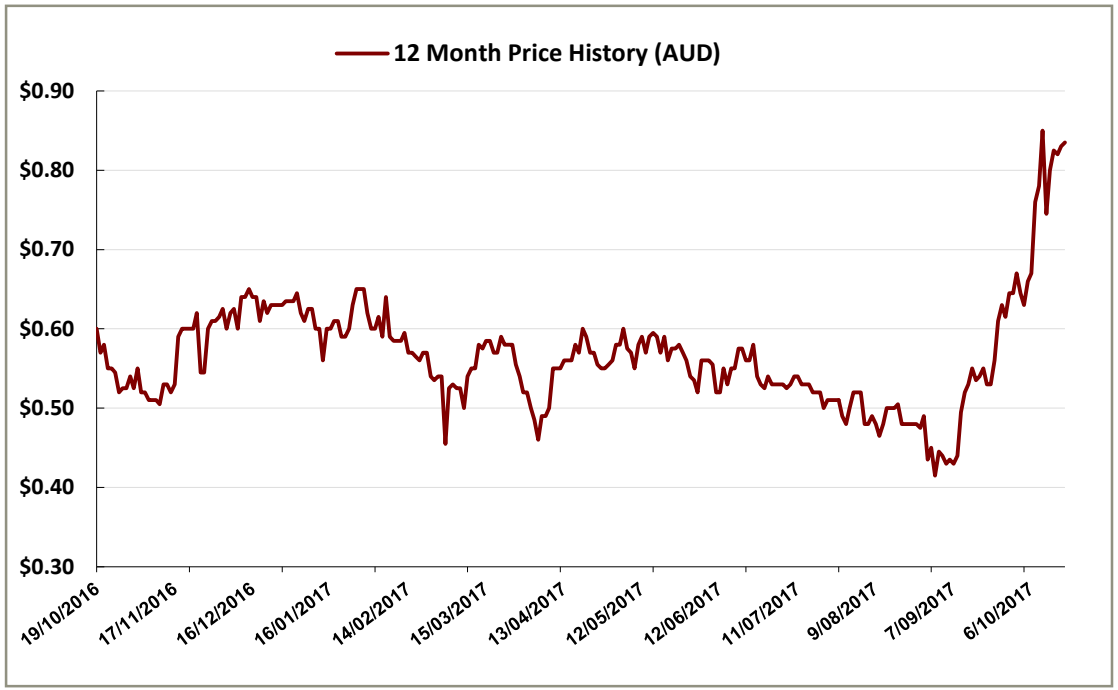
CAUTIONARY STATEMENTS AND RISK FACTORS

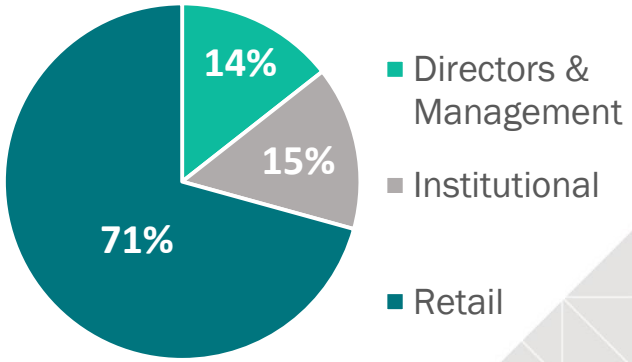
The contents of this report reflect various technical and economic conditions at the time of writing. Given the nature of the resources industry, these conditions can change significantly over relatively short periods of time. Consequently, actual results may vary from those contained in this report.

Some statements in this report regarding estimates or future events are forward-looking statements. They include indications of, and guidance on, future earnings, cash flow, costs and financial performance. Forward-looking statements include, but are not limited to, statements preceded by words such as "planned", "expected", "projected", "estimated", "may", "scheduled", "intends", "anticipates", "believes", "potential", "predict", "foresee", "proposed", "aim", "target", "opportunity", "could", "nominal", "conceptual" and similar expressions. Forward-looking statements, opinions and estimates included in this report are based on assumptions and contingencies which are subject to change without notice, as are statements about market and industry trends, which are based on interpretations of current market conditions. Forward-looking statements are provided as a general guide only and should not be relied on as a guarantee of future performance. Forward-looking statements may be affected by a range of variables that could cause actual results to differ from estimated results, and may cause the Company's actual performance and financial results in future periods to materially differ from any projections of future performance or results expressed or implied by such forward-looking statements. So there can be no assurance that actual outcomes will not materially differ from these forward-looking statements.

CORPORATE SNAPSHOT

ASX CODE	ISSUED SHARES	SHARE OPTIONS	SHARE PRICE (20 October 2017)	MARKET CAP	CASH (UNAUDITED)[1]	ENTERPRISE VALUE	TOP TWENTY SHAREHOLDERS
SFX	182.2M	13.6M[2]	A$0.82	A$149M	A$8.3M	A$141M	~50%



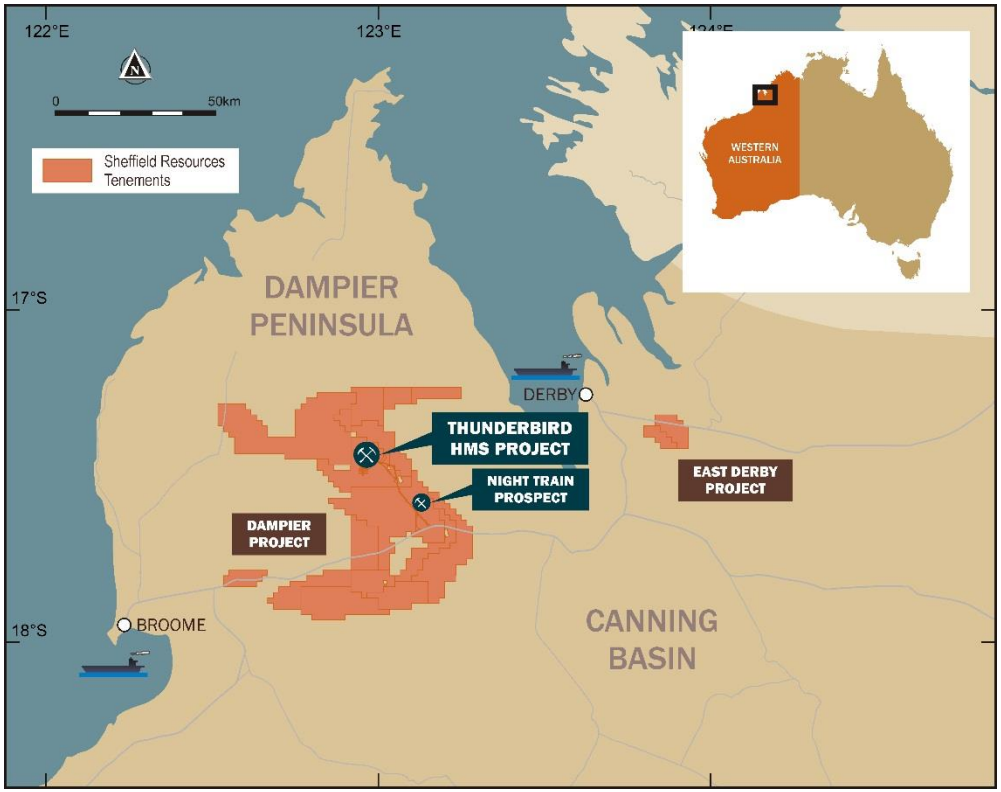


Major Shareholders

BlackRock	9%
Walter Yovich	6%
Sprott	2%
Other Institutions	4%

[1]unaudited as at 30 June 2017
[2]average exercise price A$0.46c

WORLD CLASS PROJECT

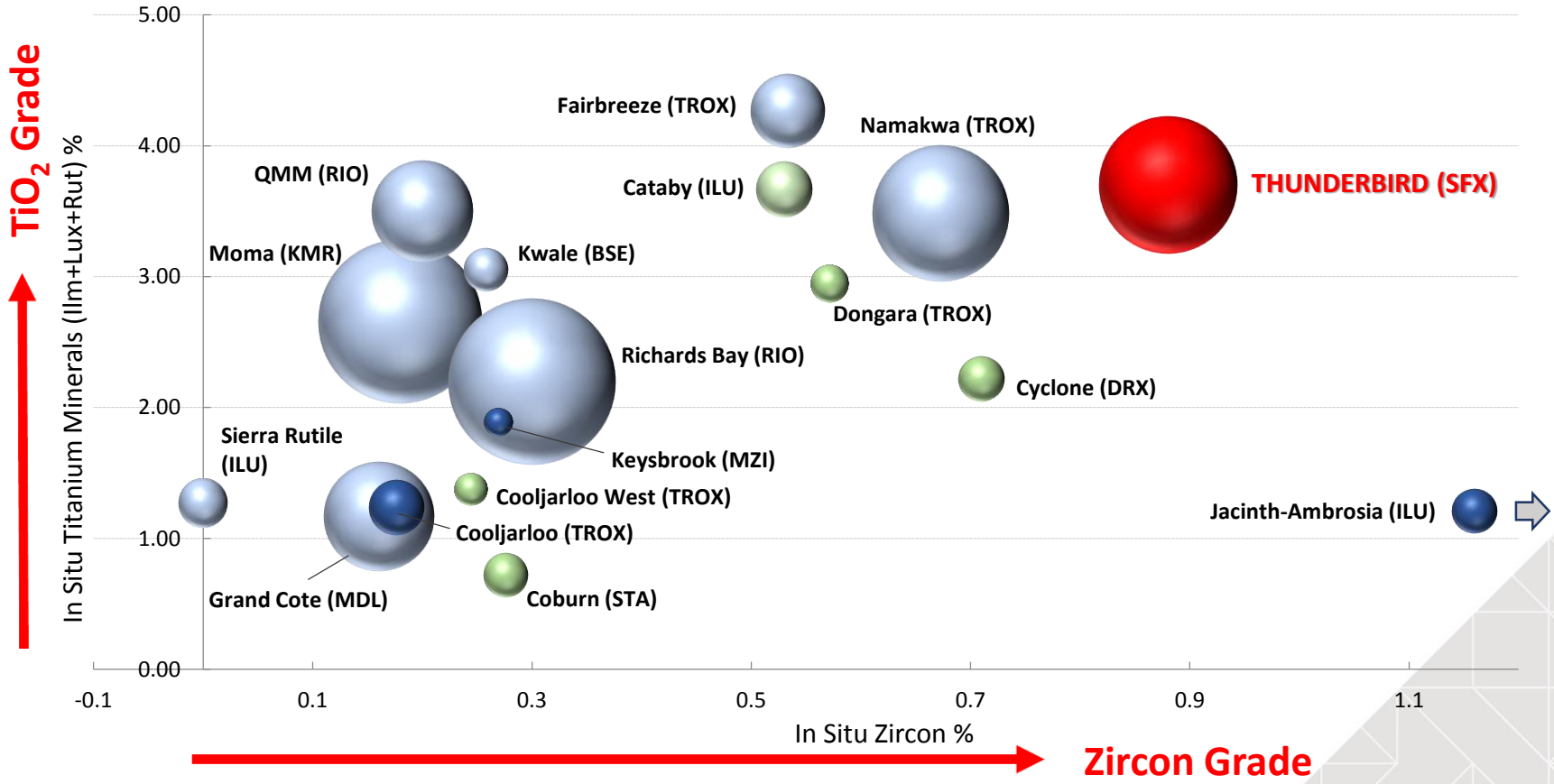


- Low risk mining jurisdiction
- Robust, high grade and consistent Ore Reserve[1]
- 42 year mine life[2]
- Closer to Asian markets than other supply
- Simple and low cost project logistics
- High quality zircon and ilmenite products
- Favorable zircon and ilmenite market
- Superior financial return
- Dominant and reliable market supplier

Discover → Develop → Operate

1. Thunderbird Ore Reserve as published on the ASX on 16 March 2017
2. Subject to permitting, offtake and financing

WORLD CLASS, HIGH GRADE ORE RESERVE



- Amongst the largest and highest grade zircon and ilmenite rich Ore Reserves
- Australia, the best mining jurisdiction in the world[1]
- Most of the world's largest minerals sands Ore Reserves are in high risk jurisdictions

Thunderbird Ore Reserve as published on the ASX on 16 March 2017
Thunderbird Ore Reserves ranked against published Ore Reserves of current mineral sands operations and projects under investigation globally
Blue bubbles are operating mines, green bubbles are Ore Reserves reported but project is not operating. Light blue bubbles represent operating African mines' Ore Reserves
Bubble size proportional to tonnes of contained VHM. Only Ore Reserves > 1.2Mt contained VHM shown.
Data compiled by Sheffield from public sources. This analysis does not illustrate the variance in product value between rutile, leucoxene and ilmenite
[1] Fraser Institute survey of mining companies 2016

OUR TEAM – EXPERIENCED AND SKILLED

BOARD

Will Burbury
Non-Executive Chairman

Bruce McFadzean
Managing Director

David Archer
Technical Director

Bruce McQuitty
Non-Executive Director

MANAGEMENT

Bruce McFadzean – Managing Director
Mining engineer with over 35 years experience leading the financing, development and operation of mines in Australia and overseas, including roles with BHP Billiton and Rio Tinto. Previously Managing Director of Catalpa Resources Limited prior to its merger with Evolution Mining and Mawson West.

David Archer – Technical Director
Geologist with over 27 years experience Australian resources sector. Has held senior positions with major Australian mining companies, including RGC Ltd, and as consultant to Atlas Iron Limited and Warwick Resources Limited, was responsible for significant iron ore discoveries.

Stuart Pether – Chief Operating Officer
Qualified mining engineer with over 25 years' experience in the resources industry, both in Australia and overseas. Stuart has extensive experience in project development, technical studies, mine operations and corporate management; including executive engagements as CEO of Kula Gold Limited, VP Project Development - Evolution Mining and COO at Catalpa Resources.

Mark Di Silvio – CFO/Company Secretary
CPA with over 25 years experience in the resources sector working across Africa and Australia. Has led financing and restructuring initiatives, holding senior finance and executive positions with RGC/Goldfields, Woodside Energy, Centamin and Mawson West.

Jim Netterfield – Project Manager
Mechanical engineer with a proven track record in successfully managing mineral development projects through to production. Professional career includes roles with BHP Billiton and Rio Tinto, and most recently four years as acting CEO and Operations Director at Oakajee Port & Rail.

Neil Patten-Williams – Marketing Manager
Experienced marketing and operations manager with over 18 years experience in the mineral sands industry, having held a number of management roles with Doral. Solid background in marketing and logistics of both zircon and titanium mineral products.

FUNDING UPDATE

Sheffield has secured a US$200 million underwritten senior debt facility from Taurus Mining Finance Fund and Taurus Mining Finance Annex Fund ("Taurus")

- Includes a US$175 million term facility and US$25 million contingent instrument facility
- Attractive funding terms:
  - Average cost of funds of ~7.6% across several tranches and the CI Facility[1]
  - A revenue royalty of 0.5% (years 1 - 4) and 0.75% (years 5 - 22.5)
  - No equity dilution, customary upfront fees
  - 7 year term with a repayment profile that is sculpted to match the cashflows using a conservative mineral sands price deck with US$100 million due at maturity
  - Facilities fully underwritten
  - Optional US$10 million unsecured equity bridge facility available
- A strong partner for Sheffield:
  - Global debt fund manager focussed on emerging mining project and acquisition finance
  - Experienced in mineral sands projects with a strong technical team
- Strong pathway to project debt funding:
  - Underwritten arrangement with no market risk of syndication
  - US$200m will provide a strong contribution to Sheffield's total funding requirement
  - DD advanced and scheduled for completion with documentation by end Q1 2018

Notes:
1. Weighted average interest cost across multiple tranches, including issuance fees payable on the CI Facility.

PROPOSED EPC AND OTHER MAJOR CONTRACTS

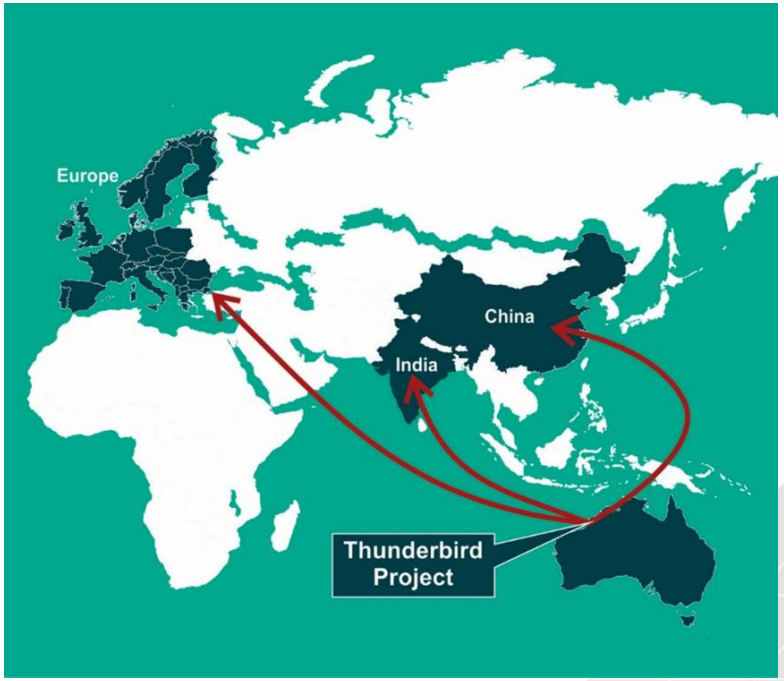
- Preferred tenderer: GR Engineering Services (GNG)
- Solid experience and quality in delivery of mineral processing plants
    - In-house engineering skills combined with strong construction capability
    - Experienced management, strong safety culture and well established systems
- Completed over $750 million of process plant construction in the last 6 years
- Participated in Thunderbird Pre Feasibility Study peer review (2014) and BFS FEED Study (2017)
- Early Works Agreement and Key Term Sheet signed
- Proposed fixed price, lump sum EPC contract
    - new 7.5 million tonne per annum (Mtpa) plant and supporting infrastructure
    - Two year construction schedule
- Company Owner's Works program to cover all other Thunderbird infrastructure
- Other major contracts being negotiated are in line with the Bankable Feasibility Study

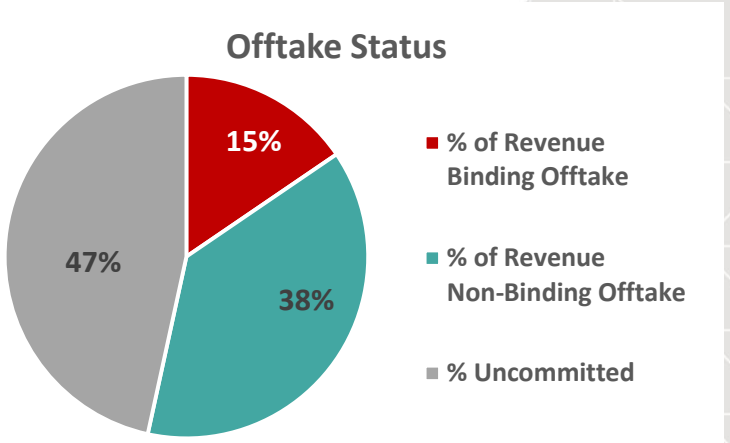
Hamilton Plant, Victoria

OFFTAKE AND MARKET STATUS

Product & (% BFS Revenue Contribution)	Non Binding Agreement Stage 1 Volume	Binding Agreement Stage 1 Volume	Offtake Parties
Premium Zircon (43%)	39%	36%	Sukaso, RZI, Ruby Ceramics, Minchem
Zircon Concentrate (19%)	48%	In Progress	RZI
LTR Ilmenite (29%)	47%	In Progress	CHTi
HiTi-88 (5%)	In Progress		
Titano-magnetite (4%)	In Progress		

- Binding off-take agreements continue in parallel with the funding process
- Thunderbird will deliver secure supply of high quality products from a low risk jurisdiction over a 42 year mine life
- The Thunderbird flowsheet will deliver high quality products with the ability to displace lower quality products in the market





MINERAL SANDS – EVERYONE, EVERYDAY

Two Distinct Product Streams

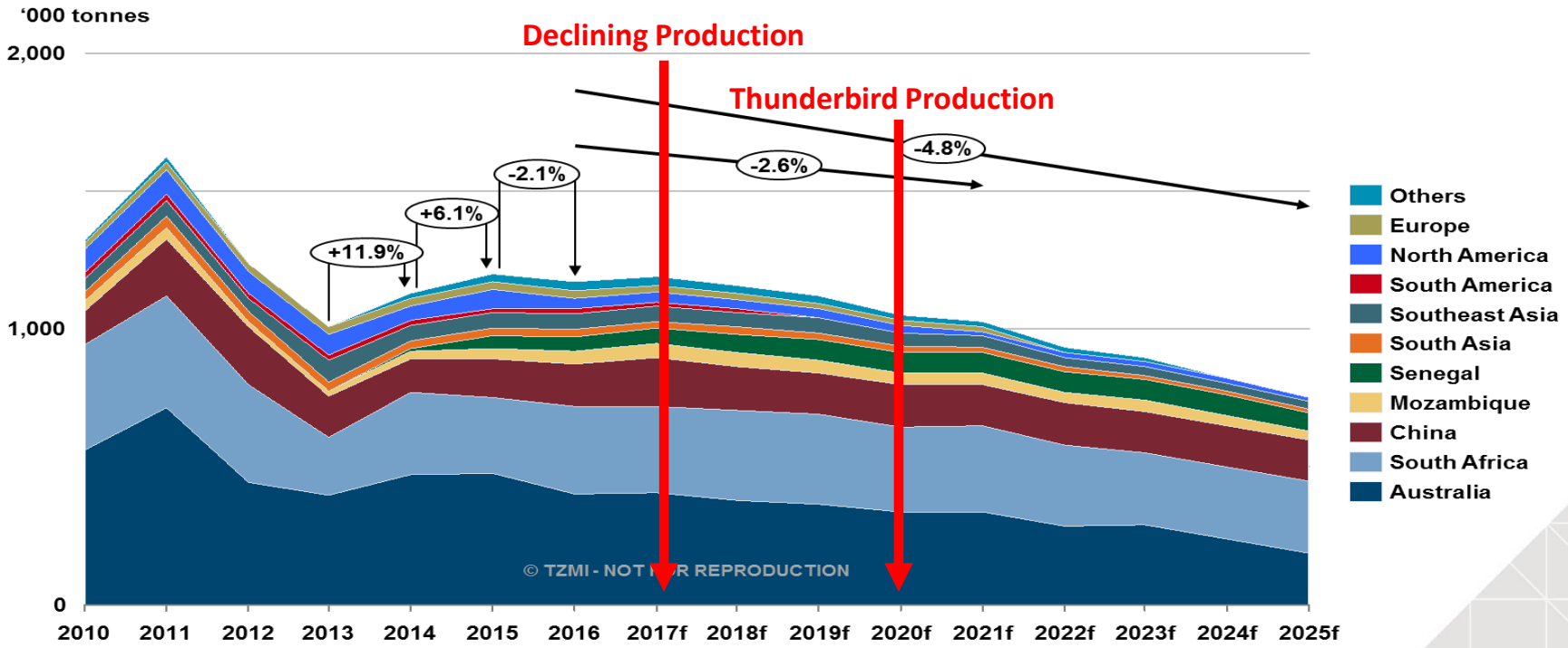
ZIRCON
BFS 62% Revenue

- 1.1 million tonne global p.a.
- >50% is used in the ceramics industry (tiles, crockery, etc.)
- Flat demand from 2012-2016
- 5 year growth 3% per annum in line with global GDP
- China now represents 45%, Europe around 20% of global demand
- Supply dominated by Australia (~50%) and Southern Africa (35-40%)
- Global production is predicted to decline from 2018
- Mature mines and jurisdiction risk impacts to production
- Industry consultants TZMI forecast a supply deficit from 2019

TITANIUM FEEDSTOCKS
BFS 35% Revenue

- 6.5-7.0 million tonne p.a. global market (TiO_2 units)
- Global ilmenite 52-58% TiO_2, rutile 95-97% TiO_2 and slag 85-95% TiO_2
- ~90% of TiO_2 feedstocks are used in manufacture of TiO_2 pigment
- TiO_2 pigment imparts whiteness, brightness and opacity to paper, plastics, sunscreen, etc.
- TiO_2 pigment is manufactured by either the sulfate or chloride processing route, each with specific feed requirements
- Demand forecast to grow at 3% p.a. in line with global GDP
- Sulfatable ilmenite predicted to be in deficit as strong demand emerged from China in 2016

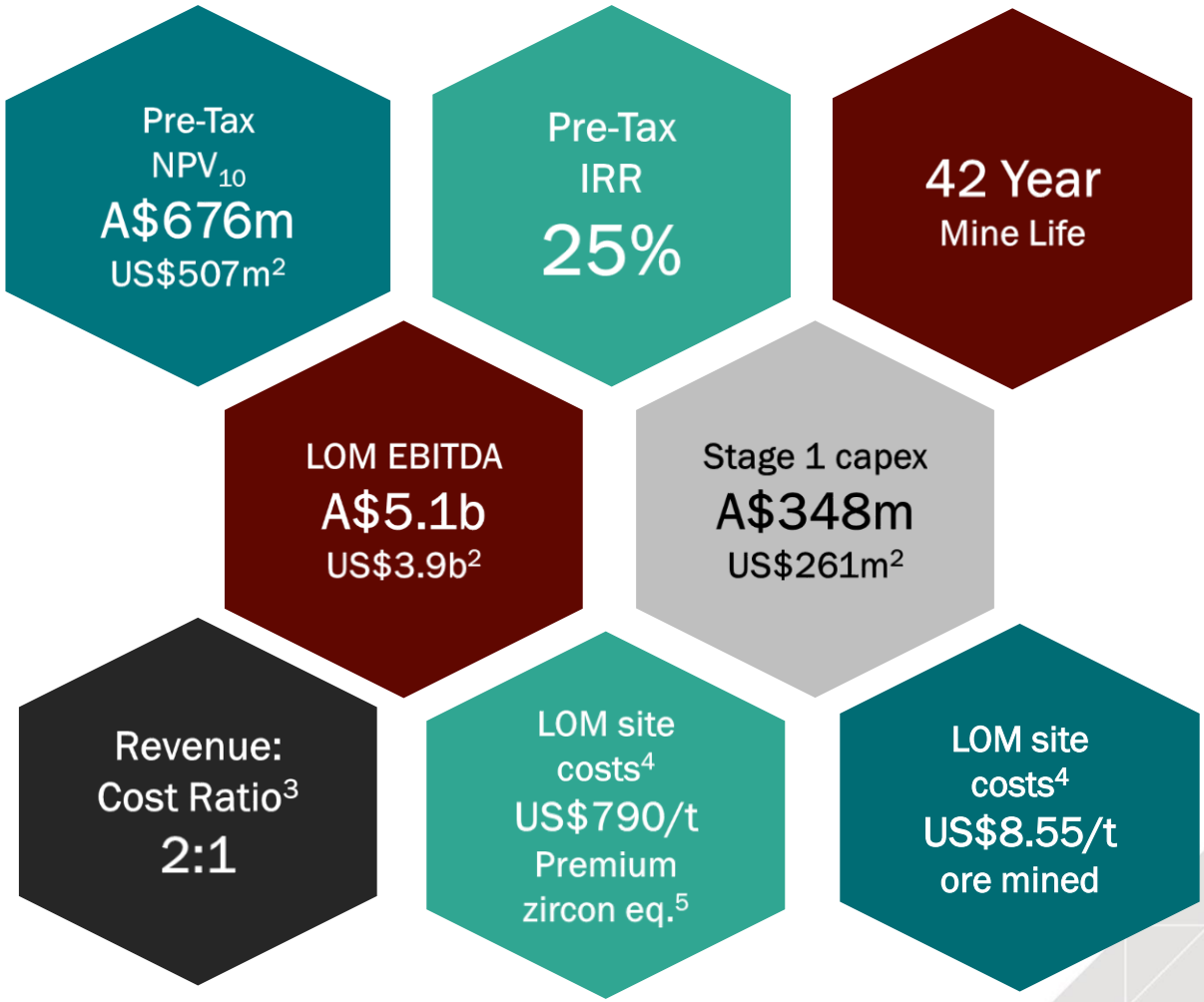
SIGNIFICANT ZIRCON SUPPLY SHORTFALL PREDICTED



- Without new projects, global zircon supply is expected to decline significantly over the coming years, 2017-2025
- Key drivers include;
  - Closure of existing mines (North Stradbroke, Mataraca, Iluka Murray Basin, Eneabba, Capel, Old Hickory, Chemours)
  - Declining grades and maturing ore bodies (Namakwa, Zulti North, Jacinth, Cooljarloo, Kwale).
- Supply levels expected to drop to 0.75 million tonnes per annum by 2025

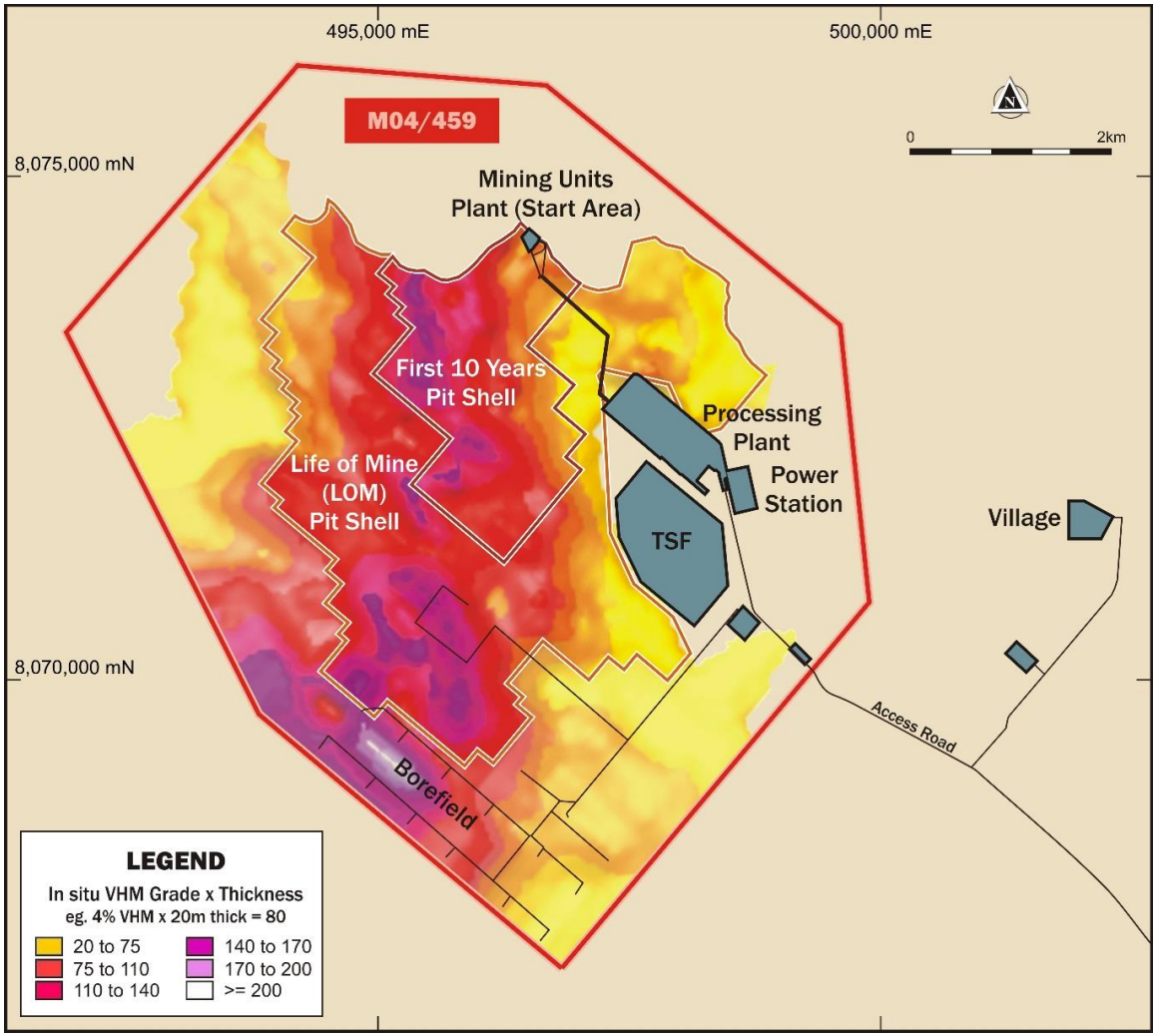
[1] Sourced from TZMI.

BFS KEY HIGHLIGHTS[1]



1. Actual results may differ from these estimates. Please refer to the assumptions, sensitivities, risk factors and cautionary statements disclosed respectively on pages 7, 9, 10 and 56 of the Company's announcement "THUNDERBIRD BFS DELIVERS OUTSTANDING RESULTS" of 24 March, 2017, which may adversely impact upon the information and forecasts in this presentation.
2. USD:AUD 75c
3. 4 year production period following Stage 1 ramp-up (i.e. Year 3 to Year 7 of operation)
4. Site costs include sustaining capex, excludes corporate overheads and royalties
5. Premium zircon equivalent tonnes is calculated as total revenue from all products divided by premium zircon price

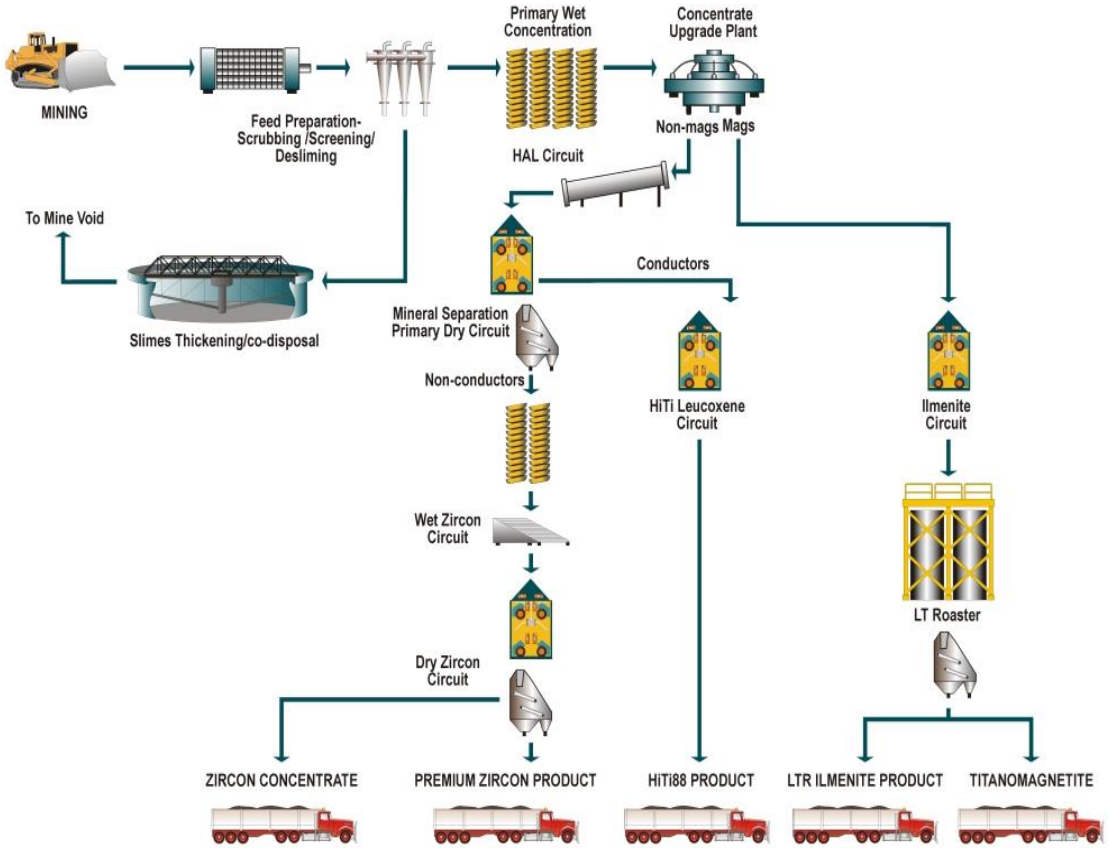
VHM GRADE AND DEPOSIT THICKNESS = VALUE



- Thunderbird has a continuous High Grade Zone of up to 46m thickness: the "GT Zone"
- Project economics are based on GT Zone's strong continuity and very high Valuable HM grades
- Near-surface, high value areas targeted in early years of production
- GT Zone remains open: ongoing expansion potential
- Process plant proposed to be located adjacent to the deposit
- WCP remains in one location over the mine life

1. VHM = Ilmenite, zircon, rutile and Leucoxene
2. Mine schedule derived from Ore Reserve ASX release 16 March 2017

CONVENTIONAL PROCESSING – HIGH QUALITY PRODUCTS



Delivers 5 quality products

Conventional heavy mineral sands processing circuit[1]

Includes an ilmenite upgrade step using a low temperature roast ("LTR")

LTR upgrades the primary ilmenite to 56.1% TiO_2 sulfate ilmenite with ability to control to higher grades

LTR ilmenite is low in chrome and alkalis with market-leading acid solubility

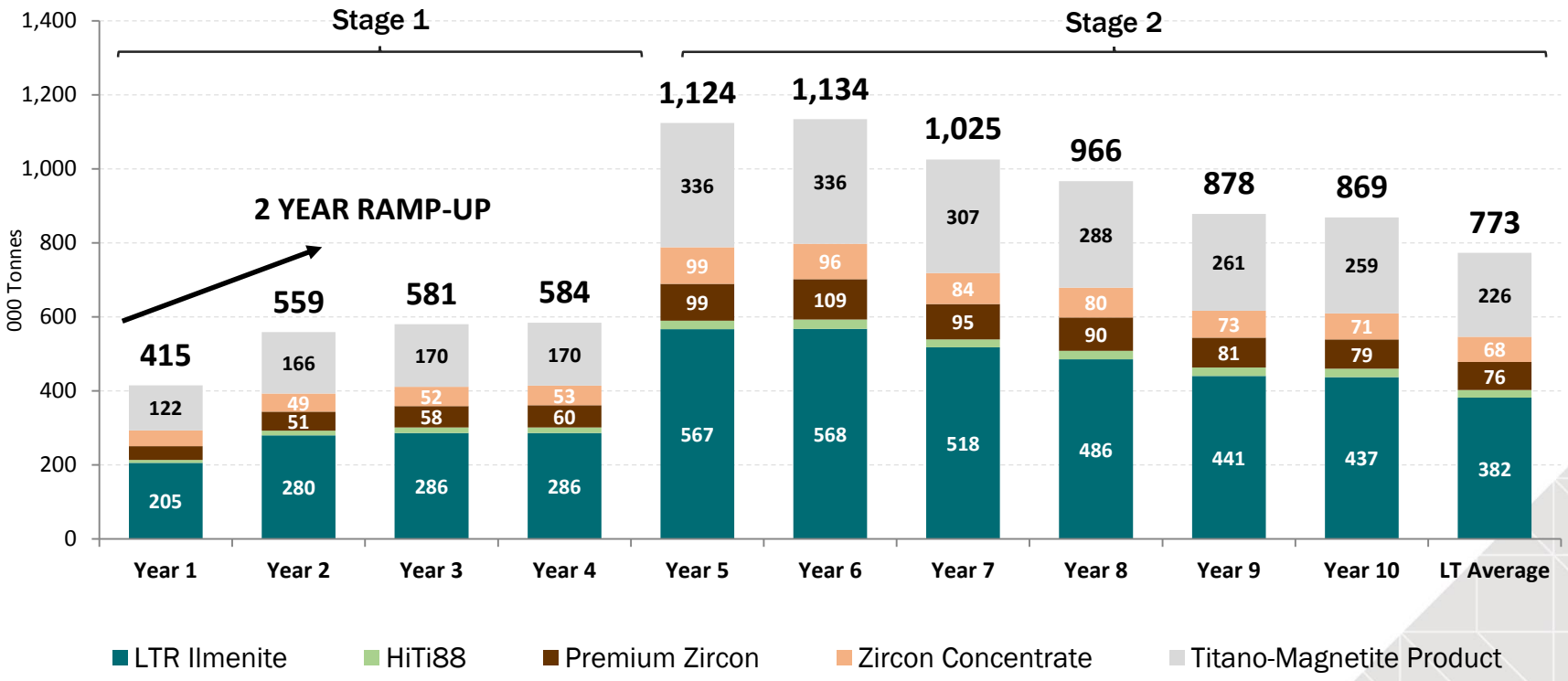
BFS illustrates premium zircon product and a secondary zircon concentrate

Recoveries[3]	BFS Test work
LTR Ilmenite	71.0%
Zircon Premium (66% ZrO_2)	56.1%
Zircon Concentrate (44% ZrO_2)	33.0%
Hi-Ti88 Leucoxene	35.3%

Total recovery to products from BFS metallurgical test work.[3]

[1] Process design by Hatch and Robbins Engineering, based on metallurgical testwork carried out on a 40t bulk sample using full scale & scalable equipment
[2] Estimated from preliminary modelling to be finalised at BFS completion in early 2017
[3] Refer ASX announcement 12 October 2016

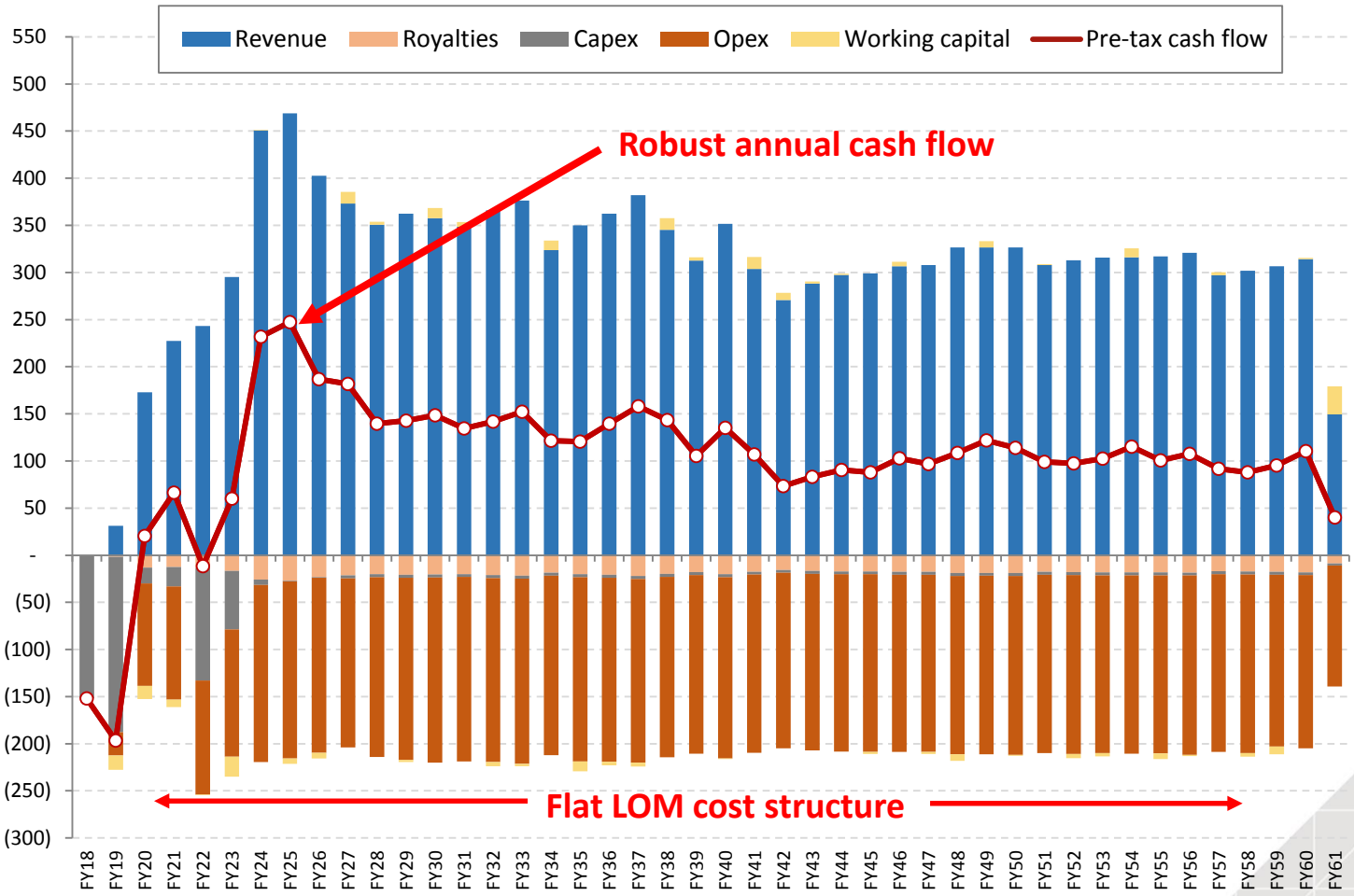
PRODUCT VOLUMES

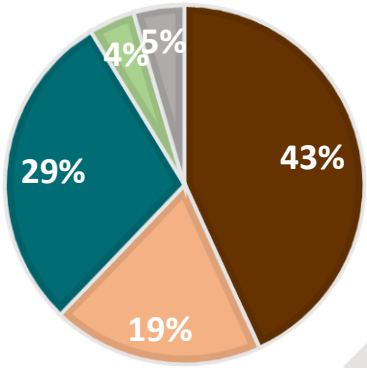


- Stage 1 produces moderate product volumes to manage market entry at a time when consensus indicates supply shortfalls
- Stage 2 expected to deliver Thunderbird as a globally significant zircon and ilmenite producer

Source: BFS model

STRONG REVENUE A$ – FLAT COST STRUCTURE



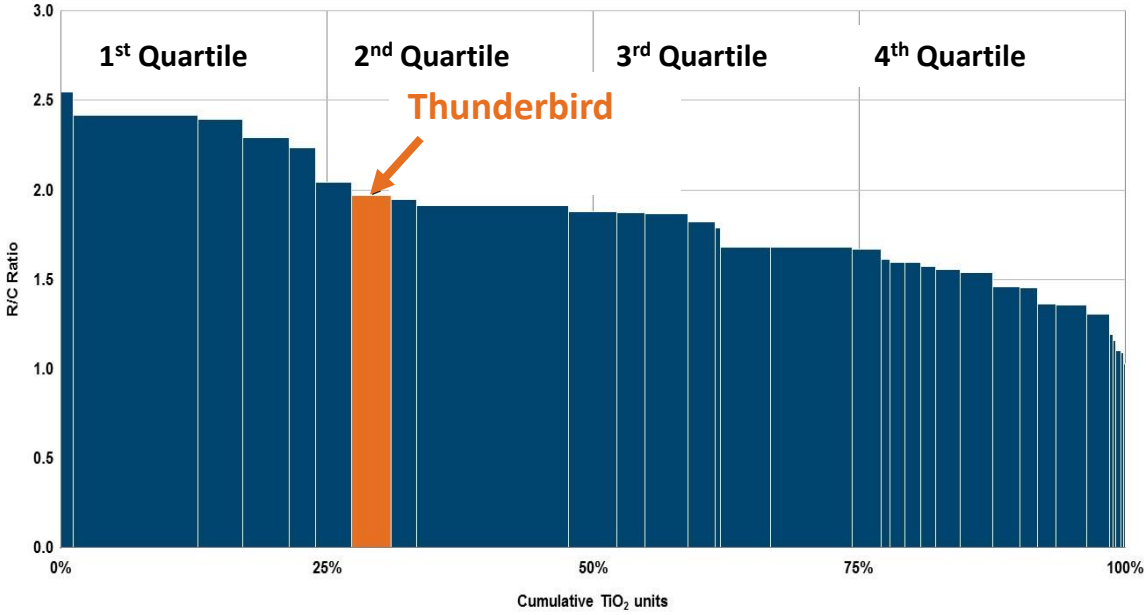


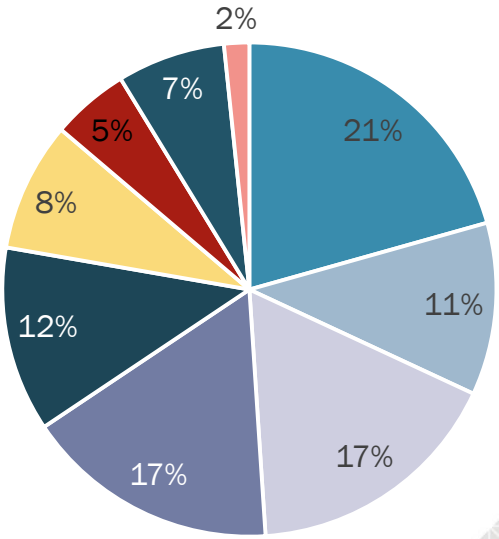
REVENUE SPLIT

- Premium Zircon
- Zircon Concentrate
- LTR Ilmenite
- Hi-Ti88
- Titano-magnetite

Source: BFS model

COMPETITIVE REVENUE TO COST RATIO





- Mining
- Labour
- Electricity
- Natural Gas
- Transport & Logistics
- Consumables
- Maintenance
- Site G&A (excluding labour)
- Sustaining Capital

80% cost

- High margin producer
- Thunderbird represented adjacent to first quartile producers, several of whom are vertically integrated with beneficiation plants
- Independently derived margin curve
- Mining, power, logistics and gas costs consistent over 42 year mine life
- Local labour numbers do not change over mine life, no FIFO costs

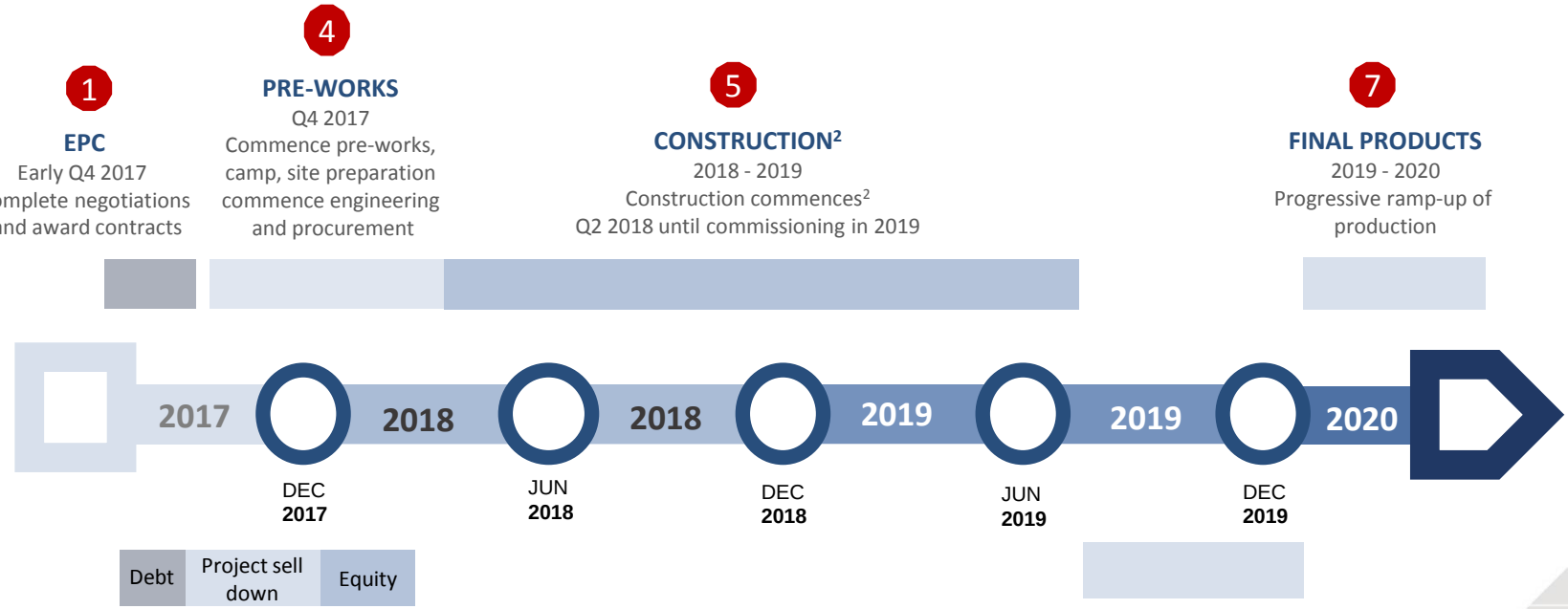
1. 4 Year production period following Stage 1 ramp-up (Year 3 to Year 7 of operation)
2. 2020 Cost Curve as presented by TZMI
3. Note that several of the competitors presented here are integrated producers of downstream feedstock and associated by products

Source: TZMI

A PROJECT FOR THE COMMUNITY

- **Lead Agency** status demonstrates State and Regional importance
- ~300 construction jobs, then up to 220 - 280 direct full time local jobs for 42 years
- Business opportunities with focus on Aboriginal participation
- Commitment to transparent Aboriginal employment, business and training
- Overwhelming community support
- Intergenerational job and training opportunities from 42 year mine life
- Products trucked 140km to ports at Derby and Broome, including 110km on major National Highway
- Road haulage fleet and marine barging based in Derby
- Access agreement in place for port storage, wharf and bulk handling facility at Derby
- EPA recommendation supports low environmental impact project
- Native Title approvals appealed to the Federal court
- Mining Lease approval recommended by National Native Title Tribunal (NNTT) and Western Australian Environmental Protection Agency (EPA)

TIMELINE – KEY TARGETS TO PRODUCTION[1]



1 **EPC**
Early Q4 2017
Complete negotiations and award contracts

2 **FUNDING & OFFTAKE[2]**
Q4 2017 – Q1 2018
Continued negotiation of binding offtake agreements and funding options including debt, partner/project sell down and equity

3 **PERMITTING**
Q4 2017 – Q1 2018
Environmental
Native Title
Mining Licence

4 **PRE-WORKS**
Q4 2017
Commence pre-works, camp, site preparation commence engineering and procurement

5 **CONSTRUCTION[2]**
2018 - 2019
Construction commences[2]
Q2 2018 until commissioning in 2019

6 **COMMISSIONING[3]**
2019
Progressive commissioning of mining, processing and logistics plant

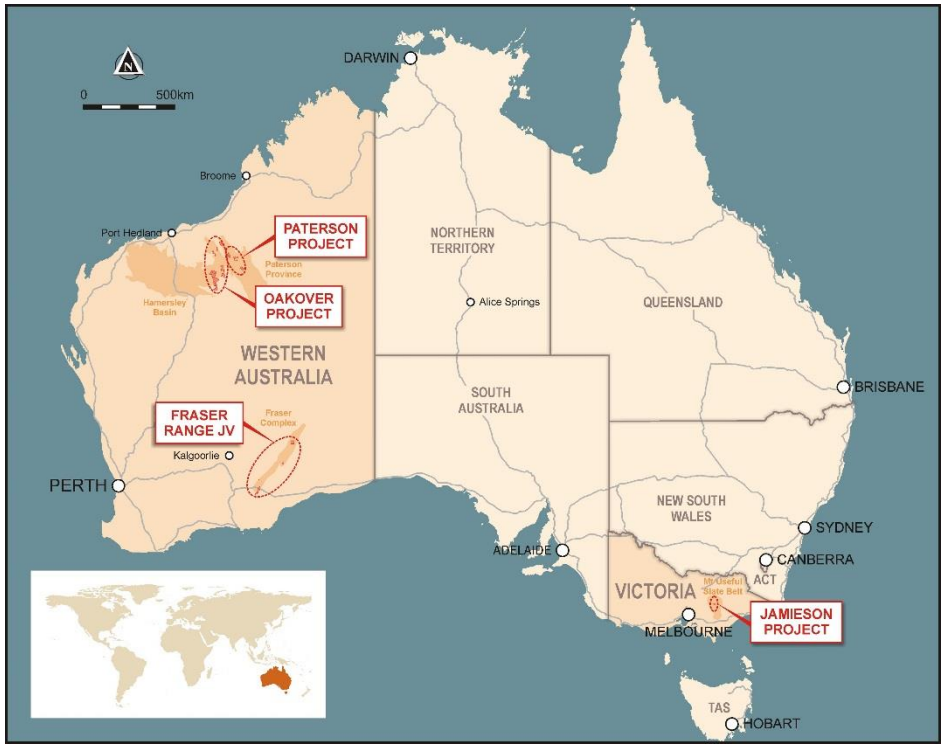
7 **FINAL PRODUCTS**
2019 - 2020
Progressive ramp-up of production

1 There is no guarantee that these targets and steps will be achieved
2 Subject to permitting, offtake and funding
3 Commissioning is anticipated to commence in 2019

THUNDERBIRD: A WORLD CLASS MINERAL SANDS PROJECT

- 42 year mine life
- 100% owned
- World's best mining jurisdiction
- Pre-tax NPV_{10} of A$676 million, IRR of 25%
- EPC term sheet complete
- Debt mandated on attractive terms
- Binding offtake progressing rapidly
- Strategic equity discussions next priority
- Targeting initial production in 2019/2020

CARAWINE RESOURCES LIMITED IPO



www.carawine.com.au

Carawine Spin-out and IPO[1]

- Sheffield subsidiary holds gold, copper and base metal exploration assets
- In specie distribution to Sheffield shareholders of one Carawine share for every nine[2] Sheffield shares held
- IPO to raise up to $7m

Jamieson Project

- High gold grades at **Hill 800**
  - **13m @ 10.9g/t Au** from surface (HEC13), incl. **3m @ 38.8g/t** Au from surface
  - **21m @ 4.04g/t Au** from 76m (HEC49), incl. **1m @ 20.9g/t Au** from 80m
- Zinc-rich VHMS at Rhyolite Creek
  - **1.4m @ 15.6% Zn, 7.4g/t Au, 113g/t Ag** from 223m
- Mineralisation open

Oakover & Paterson Projects

- Up to **44.5% Cu, 0.14% Co** in breccia and vein stockworks
- Telfer style Au-Cu, Nifty style Cu-Co

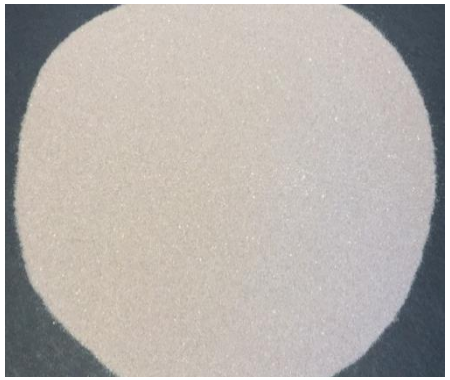
Fraser Range JV

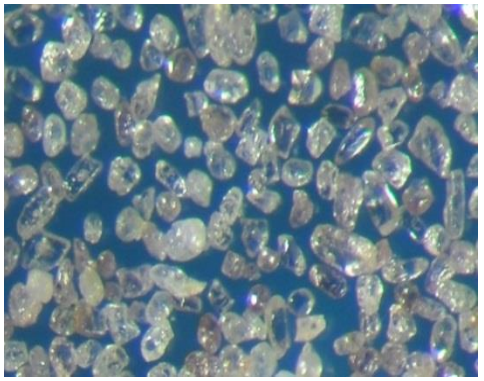
- JV with Independence Group NL, Long-term commitment to exploration in the region

1. For details see Sheffield's ASX announcement and Notice of AGM dated 19 October, 2017. The Carawine Spin-out and IPO is subject to Sheffield shareholder and regulatory approvals
2. Distribution of 1:9 is based on 20,000,000 Carawine shares and 182,216,284 Sheffield shares, will change as Sheffield share structure changes

ZIRCON - PREMIUM PRODUCT

- Ceramic Grade Zircon
- > 66% ZrO_2
- Low Fe_2O_3
- Low TiO_2
- Very Low Al_2O_3
- Moderate U+Th
- Good Opacity
- Off-take Discussions in Progress



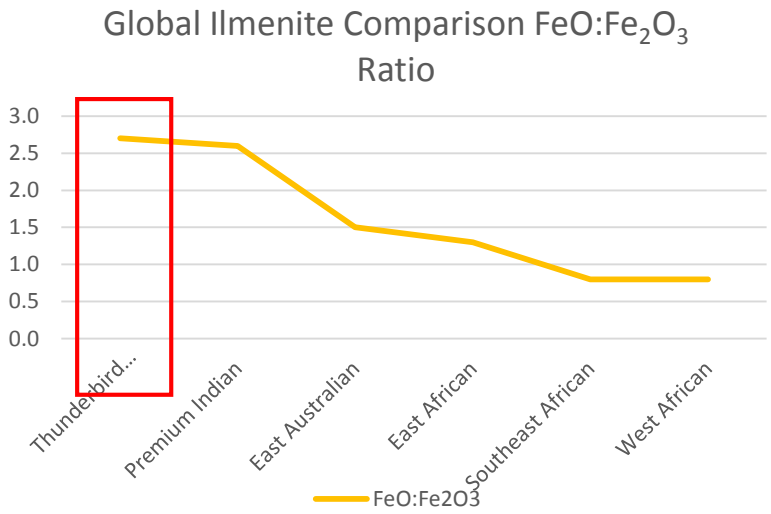


Composition (%)		Premium Zircon	Typical[1]
ZrO_2+HfO_2	%	66.2 – 66.6	66.30
TiO_2	%	0.09 – 0.18	0.14
Fe_2O_3	%	0.06 – 0.08	0.08
SiO_2	%	32.5 – 33.5	32.5
Al_2O_3	%	0.10 - 0.15	0.15

[1] Refer ASX announcement 12 October 2016

LTR ILMENITE - PREMIUM PRODUCT

- Exceptional Grade
- 56 – 58% TiO_2
- Outstanding $FeO:Fe_2O_3$
- Low Fe_2O_3 (<13%)
- Low Levels of Cr_2O_3
- High Acid Solubility
- Good reactivity rate
- Market Leading quality

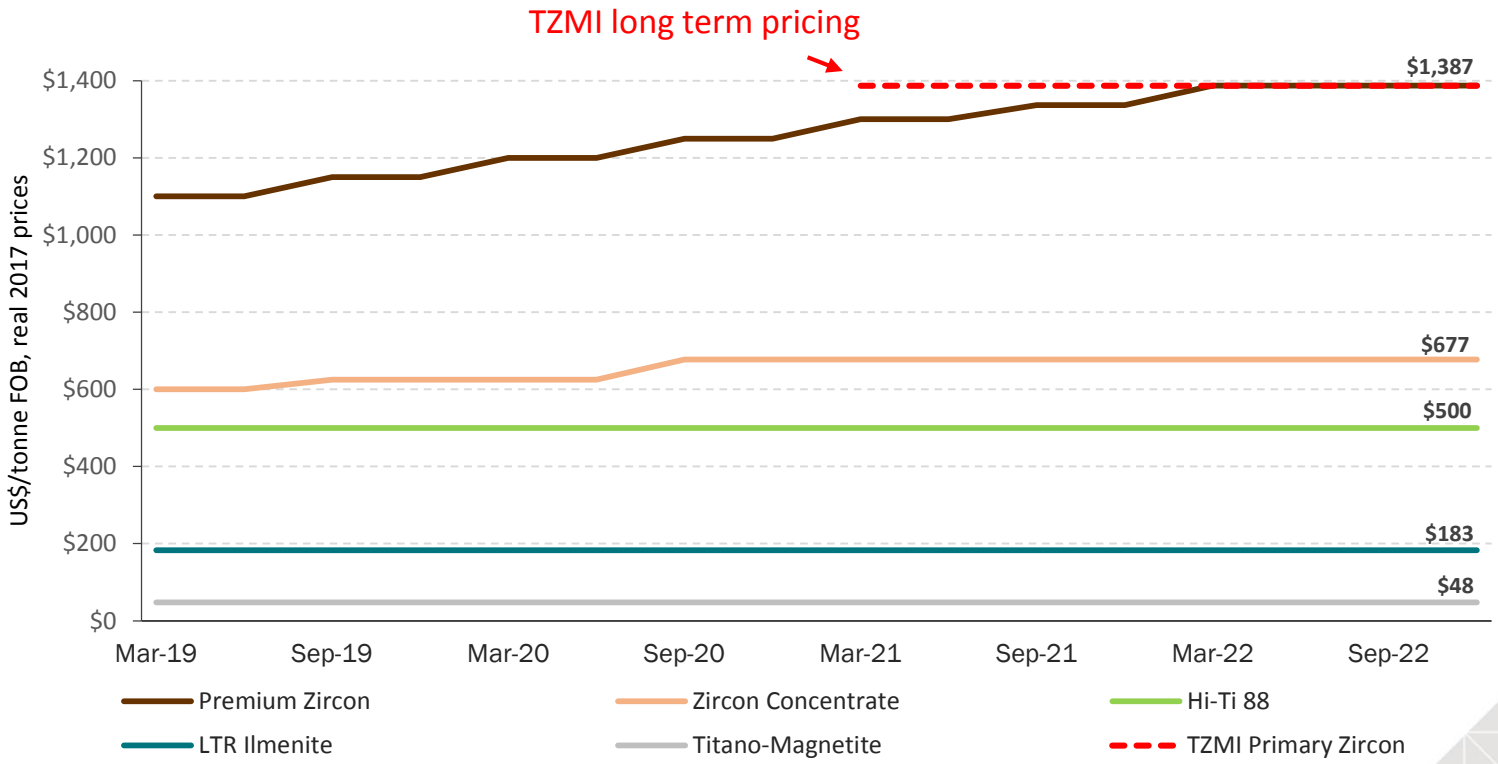


Composition (%)	Thunderbird Optimise 3 ilmenite	Premium Indian ilmenite	East Australian ilmenite	East African ilmenite	Southeast African ilmenite	West African ilmenite
TiO_2	57.9	51.5	50.7	48.2	52.4	53.2
FeO	28.1	33.5	25-29	25.5	21.4	18.9
Fe_2O_3	10.3	13.0	16-19	20.0	27.9	23.3
$FeO:Fe_2O_3$	2.7	2.6	1.5	1.3	0.8	0.8
Cr_2O_3	0.05	0.04	0.30	0.09	0.09	0.16

[1] Refer ASX announcement 13 March 2017

Appendix 3

PRODUCT PRICE ASSUMPTIONS[1]



- Sheffield has conservatively applied independent industry experts TZMI and Ruidow long-term US$ pricing recommendations for the life of mine
  - From first production for Ilmenite, Hi-Ti88 and Titano-magnetite,
  - From 2020 and 2022 for Zircon Concentrate and Premium Zircon respectively

1. Real 2017 prices and FOB.

Appendix 4

SUMMARY BFS OUTPUTS

	STAGE 1	STAGE 2	LOM
A$m, Real 2017 Prices	**Financial Year 2019 – 2023[5] (4 years)**	**Financial Year 2024 – 2033[6] (10 years)**	**LOM[7] (42 years)**
Ore Mined (Mt)	32.8	173.8	680.6
Strip Ratio (W:O)	**0.52**	**0.58**	**0.77**
VHM Grade (%)	6.41	5.10	4.49
Revenue	**854**	**3,875**	**13,560**
Royalties	(50)	(223)	(781)
Net Revenue	**803**	**3,652**	**12,779**
Opex: Mining	(104)	(421)	(1,828)
Opex: Processing	(228)	(1,024)	(4,093)
Opex: Logistics	(73)	(288)	(1,005)
Opex: Site G&A	(59)	(172)	(707)
Total Opex[1]	**(464)**	**(1,905)**	**(7,633)**
EBITDA	**339**	**1,746**	**5,146**
A$ site costs[2] / tonne ore mined	14.65	11.11	11.40
A$ revenue / tonne ore mined	25.99	22.29	19.92
US$ site costs[2] / tonne Premium Zircon eq.[3,4]	721	692	790
US$ revenue / tonne Premium Zircon eq.[3,4]	1,278	1,387	1,381

Low LOM strip ratio supports consistent and predictable LOM cost structure

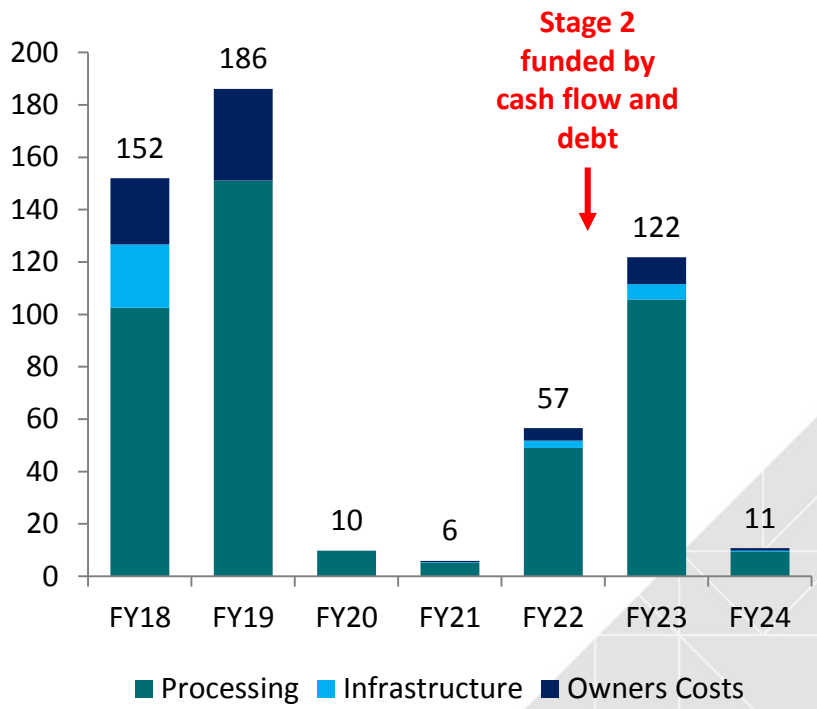
Equates to an average EBITDA of A$175/yr for 1st 10 yrs of stage 2

1. Excludes corporate overheads.
2. Includes sustaining capex, excludes corporate overheads and royalties.
3. Premium zircon equivalent tonnes calculated as total revenues across all products/premium zircon price
4. AUD:USD = 0.75:1.00
5. Stage 1 time period depicted as Q4 FY2019 to Q3 FY2023 inclusive
6. Stage 2 first 10 years depicted as Q4 FY2023 to Q3 FY2033 inclusive
7. LOM (Life of Mine) describes the period 2018 to 2061.

CAPITAL EXPENDITURE

Description	US$M	A$M
Processing – Stage 1		
Plant Area Civils & Process Water Systems	19.0	25.3
Wet Concentrator Plant	43.5	58.0
Concentrate Upgrade Plant	25.7	34.3
Zircon Processing Plant	59.2	78.9
Ilmenite Processing Plant	22.7	30.2
Low Temperature Roast	32.6	43.4
Sub-Total	**202.6**	**270.1**
Infrastructure / Owners – Stage 1		
Site Preparation, Roads & Access	5.0	6.7
Dams, Bore field & HV Infrastructure	12.0	16.0
Derby Port	5.0	6.6
Labour & Operational Readiness	6.7	8.9
Mining Services & Infrastructure	4.6	6.1
Accommodation Village	3.9	5.2
Administration & Services	3.2	4.2
Sub-Total	**40.3**	**53.7**
Contingency	**18.0**	**24.2**
Total Stage 1 Capital Cost	**260.9**	**347.9**

EPC



- EPC-based process plant capital for Stage 1
- Stage 1 contingency 7.5%
- Stage 2 capital A$195m (US$146m) excluding contingency
- Our expectation is that Stage 2 capital will be funded from cash flow and debt

1. EPC capital cost derived from tendered costs to be finalised in present negotiations
2. Stage 2 capital timing to be finalised during production ramp-up

Source: BFS model, refer ASX announcement 24 March 2017

ORE RESERVES

THUNDERBIRD DEPOSIT ORE RESERVES[1,4]

Valuable Heavy Mineral (VHM) in-situ grade

Ore Reserve Category	Ore Tonnes (millions)	In-situ HM Tonnes (millions)	HM Grade (%)	Valuable HM Grade (In-situ)[2]				Slimes (%)	Osize (%)
				Zircon %	HiTi Leuc %	Leuc %	Ilmenite %		
Proved	235.8	31.4	13.3	1.00	0.29	0.26	3.55	16.5	13.7
Probable	444.8	45.4	10.2	0.80	0.26	0.26	2.85	15.2	11.0
Total	**680.5**	76.8	**11.3**	**0.87**	**0.27**	**0.26**	**3.10**	**15.7**	**12.0**

Mineral assemblage as percentage of HM grade

Ore Reserve Category	Ore Tonnes (millions)	In-situ HM Tonnes (millions)	HM Grade (%)	Mineral Assemblage[3]				Slimes (%)	Osize (%)
				Zircon (%)	HiTi Leuc (%)	Leuc (%)	Ilmenite (%)		
Proved	235.8	31.4	13.3	7.5	2.2	1.9	26.7	16.5	13.7
Probable	444.8	45.4	10.2	7.8	2.5	2.6	28.0	15.2	11.0
Total	**680.5**	76.8	**11.3**	**7.7**	**2.4**	**2.3**	**27.4**	**15.7**	**12.0**

1) Ore Reserves are presented both in terms of in-situ VHM grade, and HM 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 Reserve is reported to a design overburden surface with appropriate consideration of modifying factors, costs, mineral assemblage, process recoveries and product pricing.

2) The in-situ grade is determined by multiplying the HM Grade by the percentage of each valuable heavy mineral within the heavy mineral assemblage.

3) Mineral Assemblage is reported as a percentage of HM Grade, it is derived by dividing the in-situ grade by the HM grade.

4) Ore Reserves reported for the Dampier Project were prepared and first disclosed under the JORC Code (2012), refer to Sheffield's ASX announcement dated 16 March 2017 for further detail.

MINERAL RESOURCES

THUNDERBIRD DEPOSIT MINERAL RESOURCE[1,2,7]

Cut-off (HM%)	Mineral Resource Category	Material Tonnes (millions)	In-situ HM Tonnes (millions)	HM Grade[3] (%)	Valuable HM Grade (In-situ)[4] Zircon (%)	HiTi Leuc (%)	Leuc (%)	Ilmenite (%)	Slimes (%)	Osize (%)
> 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
	Total	**3,230**	**223**	**6.9**	**0.57**	**0.18**	**0.20**	**1.9**	**16**	**9**
>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
	Total	**1,050**	**127**	**12.2**	**0.93**	**0.28**	**0.26**	**3.3**	**15**	**11**

Cut-off (HM%)	Mineral Resource Category	Material Tonnes (millions)	In-situ HM Tonnes (millions)	HM Grade (%)	Mineral Assemblage[5] Zircon (%)	HiTi Leuc (%)	Leuc (%)	Ilmenite (%)	Slimes (%)	Osize (%)
> 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
	Total	**3,230**	**223**	**6.9**	**8.3**	**2.6**	**2.9**	**28**	**16**	**9**
>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
	Total	**1,050**	**127**	**12.2**	**7.6**	**2.3**	**2.1**	**27**	**15**	**11**

THUNDERBIRD DEPOSIT CONTAINED VALUABLE HM (VHM) IN MINERAL RESOURCES[1,2,6]

Cut-off (HM%)	Mineral Resource Category	Zircon Tonnes (thousands)	HiTi Leucoxene Tonnes (thousands)	Leucoxene Tonnes (thousands)	Ilmenite Tonnes (thousands)	Total VHM Tonnes (thousands)
>3% HM	Measured	3,600	1,000	1,000	12,000	17,700
	Indicated	11,800	3,800	4,300	39,100	59,000
	Inferred	3,200	1,000	1,200	10,500	15,900
	Total	**18,600**	**5,900**	**6,500**	**61,700**	**92,600**
>7.5% HM	Measured	2,300	700	600	8,400	12,000
	Indicated	5,800	1,800	1,600	21,000	30,200
	Inferred	1,600	500	500	5,600	8,200
	Total	**9,700**	**3,000**	**2,700**	**35,000**	**50,400**

1) 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. 2) 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. 3) Total heavy minerals (HM) is within the 38µm to 1mm size fraction and has been reported as a percentage of the total material quantity. 4) 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. 5) 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 and; Ilmenite 40-70% TiO_2; Leucoxene 70-94% TiO_2; High Titanium Leucoxene (HiTi Leucoxene) >94% TiO_2 and Zircon 66.7% ZrO_2+HfO_2. The non-magnetic fraction was analysed by XRF and minerals determined as follows: Zircon ZrO_2+HfO_2/0.667 and HiTi Leucoxene TiO_2/0.94. 6) The VHM inventory is derived from information in the Mineral Resource tables. 7) The Mineral Resource estimate was prepared and first disclosed under the JORC Code (2012), refer to Sheffield's ASX announcement dated 5 July 2016 for further detail.