

SHEFFIELD RESOURCES (SFX)

BFS Update confirms much stronger & simpler project

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We say

Price

Target

Strategic Target

BUY

0.58 2.30 3.00

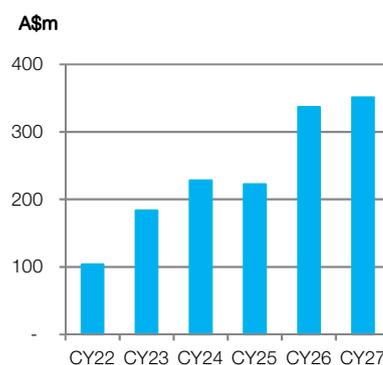
Sheffield's BFS Update for Thunderbird included several material improvements, driven by removal of the low temp roast circuit – i.e. lower capex, improved IRR, but more importantly a much simpler and conventional flowsheet. The remaining funding need for Thunderbird has been reduced to A\$143m and SFX is confident of a positive outcome from its partner search which has been running since January. We upgrade our Target by 35% from \$1.70 to \$2.30 and maintain our Buy rating.

SHARE PRICE CHART



Source: IRESS, Blue Ocean Equities

FORECAST OPERATING CASHFLOW



Source: Company, Blue Ocean Equities

COMPANY DATA & RATIOS

Enterprise value	\$161m
Diluted market cap*	\$164m
Diluted shares*	283m
Free float	100%
12-month price range	\$0.30-1.28
GICS sector	Materials
Board & Management hold	~10% (FD)
*Diluted for 14.3m ITM options	

IMPLIED RETURN

Implied all-in return	297%
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BFS UPDATE: MUCH STRONGER & SIMPLER

By removing the Low Temp Roast circuit, Thunderbird is now a lower capex, better return on capital project, but also a *simpler* project. On BFSU assumptions, Thunderbird now has a post-tax NPV of A\$980m and IRR of 24% at an A\$/US\$ of 0.75. Our forecasts are based on a 70c A\$, increasing the NPV to A\$1.1bn and IRR to 26%. At spot prices these metrics increase to A\$1.4bn and 30% (see p4)

NEXT STEPS FOR THUNDERBIRD

Based on the reduced capex estimate of A\$392m and existing debt facilities, the remaining funding need has now been reduced to A\$143m. Sheffield is hoping to commence construction of Thunderbird before end CY19 and has been running a partner process. SFX is aiming to sell a 20-25% stake in the project to reduce the remaining funding need (see p3).

AN IMPLIED POTENTIAL RETURN OF ~300%

After updating our forecasts for the BFS Update, we increase our Price Target by 35% from \$1.70 to \$2.30, an implied potential return of ~300%. Our DCF-valuation is based on zircon prices of US\$1,450/t (vs. spot of US\$1,580/t) and an A\$/US\$ of 0.70 (vs spot of 0.68). If Sheffield can successfully find a partner for Thunderbird, we believe our valuation is likely to increase to our \$3.00 Strategic Target (see p7).

A MUCH STRONGER AND SIMPLER PROJECT

On 31 July 2019, Sheffield released a BFSU Update (BFSU) for its Tier 1 Thunderbird Minerals Sands project in WA.

The initial motivation to reassess the project design was driven by the need to reduce upfront capital, but ultimately resulted in a much better project in terms of:

- **Lower Capex** – funding requirement reduced by ~A\$101m
- **Better Return on Capital** – Pre-tax IRR of ~30% at what we regard as conservative price and FX assumptions¹
- **Crucially a Simpler Flowsheet** – One of the key pushbacks on Thunderbird has been the Low Temp Roast (LTR) circuit because it was a unique element in the process flow sheet (i.e. the only one of its kind in the world). Removing the LTR circuit means 100% of Thunderbirds flowsheet now employs conventional and tried and tested components.
- **Higher NPV** – The post-tax NPV of Thunderbird is now A\$980m using 0.75 A\$/US\$ and well north of A\$1bn at 0.70 or spot of 0.68

The table below provides a more detailed comparison of the changes to Thunderbird.

Metric	2019 BFSU	Previous Disclosures	Change
Total Funding Requirement	A\$478m	A\$579m ¹	▼ A\$101m (17%)
Equity Requirement	A\$143m	A\$251m ¹	▼ A\$108m (43%)
Project Capital	A\$392m	A\$463m ¹	▼ A\$71m (15%)
Project Revenue	A\$15.1B	A\$13.6B ²	▲ A\$1.57B (11%)
Project Operating Costs	A\$7.21B	A\$7.63B ²	▼ A\$0.42B (6%)
NPV ₁₀ pre-tax	A\$1.13B	A\$0.67B ²	▲ A\$0.46B (69%)
NPV ₈ post-tax	A\$0.98B	A\$0.62B ²	▲ A\$0.36B (58%)
IRR pre-tax %	30.1%	24.9% ²	▲ 5.2% (21%)
Zircon Production (average '000tpa)	202	145 ²	▲ 57 (39%)
Offtake	~100%	>75%	Full
LTR & Ilmenite Process Circuit	Not Required	Included in Stage 1 ²	▲ Removed
Process Rate (t/hr)	1,085	788 ²	▲ 297 (38%)
Mine Life	37 years	42 years ²	▼ 5 years (12%)
Long Term Average FX Rate (A\$/US\$)	0.75	0.75 ²	No change
Long Term Zircon Price (TZMI)	US\$1,469	US\$1,387 ²	▲ US\$82 (6%)

The revised capex for Thunderbird is based on an agreed EPC contract with the well regarded GR Engineering (GRES).

Importantly, this EPC contract also includes agreed recovery and performance test guarantees.

Discussions have commenced with GRES to convert the BFSU cost estimate into a fixed price lump sum EPC agreement.

Source: Sheffield BFSU Update, 31 July 2019

¹ BFSU Price & FX assumptions: US\$1,469/t premium zircon vs. spot of US\$1,580/t. 0.75 A\$/US\$ vs. spot of 0.68

HOW ARE THESE IMPROVEMENTS POSSIBLE?

Many investors will ask the question - why didn't Sheffield design the project this way the first time? And the short answer is - it simply wasn't possible when the first BFS was completed.

The ilmenite market has tightened considerably since the first BFS allowing Sheffield to sell unroasted Ilmenite (~25% of revenue) and **this product stream is already under binding offtake for 7 years**. The zircon price has also improved materially since the original BFS in March 2017.

NEXT STEPS FOR SHEFFIELD

Sheffield is aiming to begin construction of Thunderbird before year end and the next steps are:

- **Finalise lender due diligence in Q3/Q4** based on revised project
- **Finalise Partnering Process** – i.e. sell a stake in the project to further reduce the remaining A\$143m equity component (see below)
- **Raise balance of equity required**
- **Commence construction**

FUNDING THE DEVELOPMENT OF THUNDERBIRD

Sheffield's BFS Update included a detailed summary of the financing plan for Thunderbird as set out below. According to Sheffield, the outstanding funding remaining is A\$143m.

Funding Uses	A\$m	Funding Sources	A\$m
Initial Capex	392	Taurus Debt	50% 240
Cost overrun facility	40	NAIF Debt	20% 95
Interest during construction	27	Funding to come	30% 143
Financing Costs	17		
Working Capital	2		
Total	478	Total	478

Source: Blue Ocean Equities, Sheffield BFS Update, 31 July 2019

Sheffield has been running a process to find a potential partner to assist in both funding and developing Thunderbird. We believe the company is aiming to sell a ~20-25% stake in the project which we believe could potentially raise A\$60-90m, but potentially more. Such a price represents a *material* discount to NPV and as such should be an attractive proposition for potential partners. To illustrate:

- **BFSU post-tax NPV A\$980m**: Implies a 20-25% stake is worth A\$196-245m
- **Blue Ocean post-tax NPV A\$1,135m²**: Implies a 20-25% stake is worth A\$227-284m

At 30 June 2019, Sheffield had A\$2.7m in cash and no debt. On 25 June 2019, Sheffield confirmed it had mandated Taurus to provide a US\$10m bridge finance facility.

² The key difference is the Blue Ocean valuation uses 0.70 A\$/US instead of the SFX assumption of 0.75 vs. spot at the time of writing of 0.685. The Blue Ocean valuation also assumes a lower premium zircon price. A more detailed comparison of assumptions is provided on p4.

COMPELLING FUNDAMENTAL VALUE

In our view, Sheffield represents compelling fundamental value. The table below compares the valuation and key financial metrics for Thunderbird under three key pricing and FX assumptions:

		BFSU	Blue Ocean	Spot
Macro assumptions				
Premium Zircon	US\$/t	1,474	1,450	1,580
Zircon concentrate	US\$/t	719	725	790
Primary Ilmenite	US\$/t	96	95	100
Australian dollar	A\$/US\$	0.75	0.70	0.68
Financial metrics				
NPV post-tax	A\$m	980	1,135	1,453
IRR post-tax	%	24%	26%	30%
Operating metrics				
Operating margin	A\$m	193	219	265
Operating margin	%	45%	48%	52%

For context, at the time of writing, Sheffield has a fully diluted market cap of only A\$163m (@ 58c)

Source: Blue Ocean Equities estimates, Sheffield BFS Update, 31 July 2019

SENSITIVITY ANALYSIS

The tables below provide a sensitivity analysis of Thunderbird's NPV post-tax and IRR post-tax at a range of premium zircon prices and A\$/US\$ exchange rates. The table below assume a primary ilmenite price of US\$95/t and zircon concentrate prices at 50% of the premium zircon price.

NPV post-tax (A\$m)		Premium Zircon* (US\$/t)				
		1,300	1,400	1,500	1,600	1,700
A\$/US\$	0.65	1,134	1,283	1,431	1,580	1,729
	0.68	1,007	1,149	1,291	1,433	1,575
Exchange Rate	0.70	928	1,066	1,204	1,342	1,480
	0.75	750	879	1,007	1,136	1,265

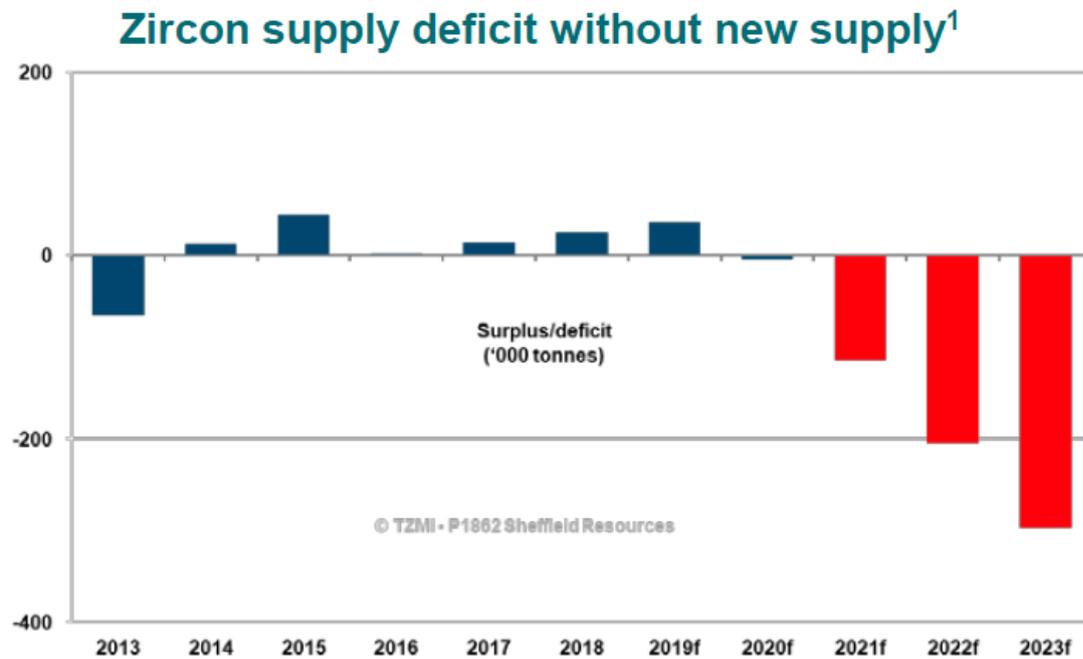
IRR post-tax (A\$m)		Premium Zircon* (US\$/t)				
		1,300	1,400	1,500	1,600	1,700
A\$/US\$	0.65	26%	28%	30%	32%	34%
	0.68	25%	27%	28%	30%	32%
Exchange Rate	0.70	24%	25%	27%	29%	31%
	0.75	21%	23%	25%	26%	28%

Source: Company, Blue Ocean Equities estimates. Spot zircon price US\$1,580/t, Spot A\$/US\$ 0.68

MACRO OUTLOOK FOR ZIRCON INTACT

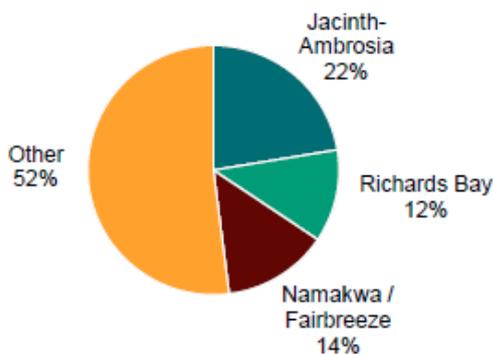
On 24 July 2019, Iluka (ILU) released its June quarter report and minerals sands outlook commentary. While ilmenite markets remains tight and strengthening, Iluka reported a softening in zircon demand during the quarter which we believe is likely to be short-term in nature and related to China/US trade war concerns.

In our view the outlook for zircon remains compelling due to declining supply. Around 50% of global zircon supply comes from 3 large mature mines where grades and ore reserves are declining. Iluka's Jacinth-Ambrosia mine represents 22% of supply and is due to close within the next few years.



Source: TZMI, Sheffield BFS Update, 31 July 2019

Split of Global Zircon Production²



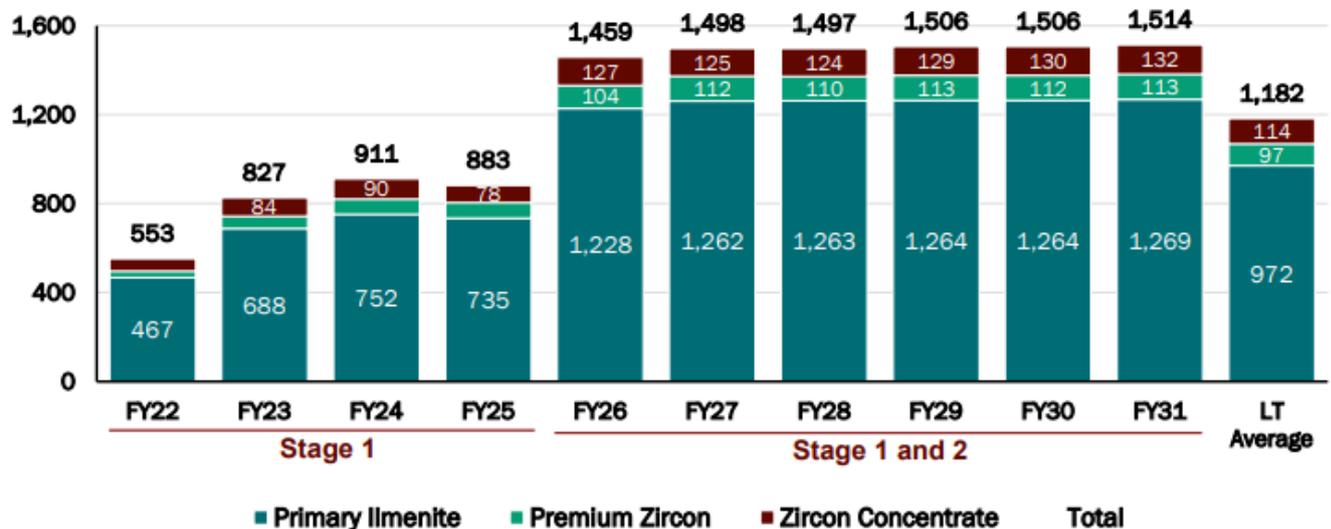
Source: TZMI, Sheffield BFS Update, 31 July 2019

A LARGE SCALE, HIGH MARGIN PROJECT

The TZMI chart on the previous page highlights large and growing zircon supply deficits of ~100kt / ~200kt / ~300kt in FY21 / FY22 / FY23. Thunderbird is due begin production during this period at a rate of 132kt of zircon products, growing to ~200ktpa by FY26 after the Stage 2 expansion has been completed.

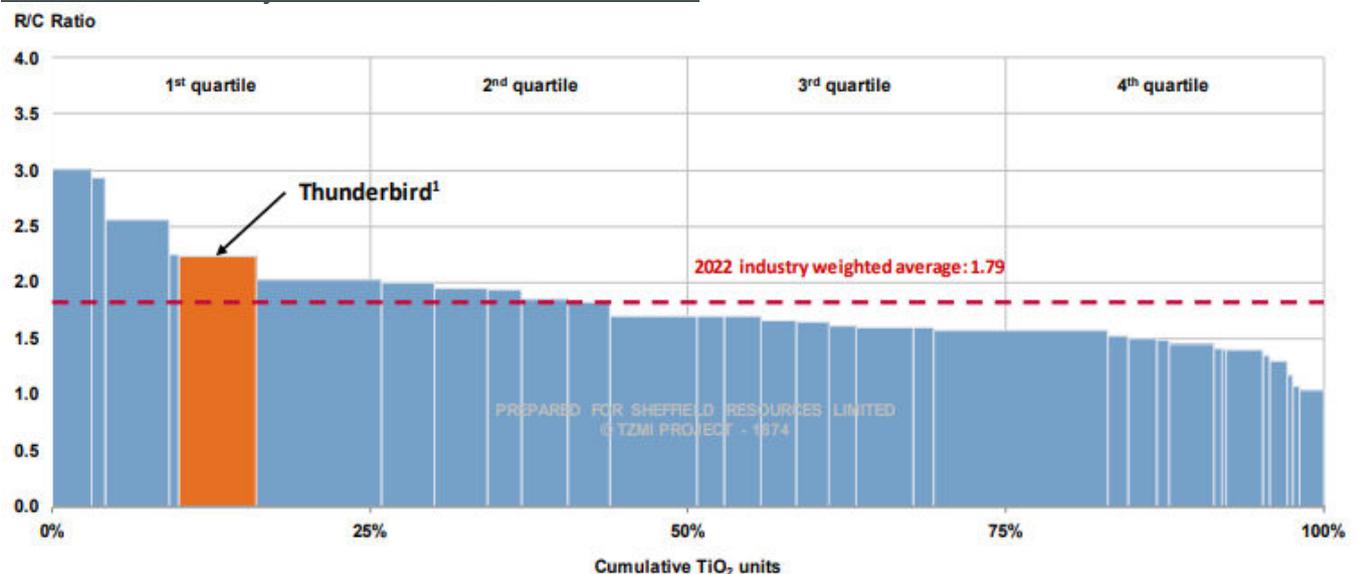
Thunderbirds Planned Production

Sales Volume (Average tonnes per annum)	Stage 1 FY 2022 – 2025	Stage 1 and 2 FY 2026 – 2031	LOM
Premium Zircon	55,000	111,000	92,000
Zircon Concentrate	77,000	128,000	110,000
Primary Ilmenite	660,000	1,258,000	961,000



Source: Sheffield BFS Update, 31 July 2019

TZMI 2022 Industry Revenue to Cash Cost Curve



Source: Sheffield BFS Update, 31 July 2019

PRICE TARGET & RATING

After adjusting our forecasts for the BFS Update for Thunderbird we increase our Price Target by 35% from \$1.70 to \$2.30 and maintain our Buy recommendation.

We have made a number of changes to our forecasts with the key changes being:

- We have updated our Thunderbird project metrics to reflect the BFS Update
- We have delayed the start of construction by 6 months to late CY19 / early CY20
- Our key macro assumptions remain unchanged:
 - A flat 70c A\$/US\$ vs. spot of 0.68
 - Premium zircon price of US\$1,450/t, 8% below Iluka's current reference price of US\$1,580/t
- We have adopted Sheffield's prices for its primary ilmenite product of ~US\$95/t, which we assume is based on the contracted price linked to an ilmenite benchmark price.
- Our valuation is based on a DCF approach to which **we include a 40% discount to NPV** to allow for potential dilution and funding risks until the financing plan for Thunderbird has been finalised.

Our \$2.30 Price Target represents an implied potential return of ~300%

STRATEGIC TARGET

Our revised \$3.00 Strategic Target (previously \$2.00) for Sheffield Resources is based on scenario where Sheffield is successful in its partner process and manages to sell 20% of Thunderbird for \$90m, representing a 60% discount to our NPV of Thunderbird.

Given Sheffield is trading at such a large discount to NPV, selling a stake in the project is a far less dilutive funding approach than raising straight equity.

Our \$3.00 Strategic Target represents an implied potential return of ~400%.

KEY RISKS

Sheffield Resources is exposed to all the normal risks associated with developing and operating mining projects, including funding, construction, commissioning and ramp-up risk.

Assuming Sheffield makes the transition into production, its revenues will be derived from the sale of premium zircon (44% of revenue on BFSU assumptions), zircon concentrate (26% of revenue) and primary ilmenite (30% of revenue). Fluctuations in the prices of these products as well as the Australian dollar could impact the company's reported cash flow (in A\$), profitability and share price.

Sheffield has contracts in place for 100% of the offtake for Thunderbird for Stage 1 with a series of Chinese, Indian and other customers. An investment in Sheffield carries offtaker counterparty risk.

As Sheffield's Thunderbird project is based in Western Australia, an investment in Sheffield also carries Australian sovereign risk. However, it is worth noting that Australia is considered materially lower sovereign risk than many of the other jurisdictions which host mineral sands mines like South Africa (Rio Tinto), Mozambique (Kenmare) and Kenya & Madagascar (Base Resources).

MODEL SUMMARY: FINANCIALS & VALUATION

Stock Details				Enterprise Value	
Recommendation:	BUY			Diluted MCap	\$161m
Target	\$2.30	Share Price	\$0.58	Diluted Shares	283m
NAV	\$2.31	52 Week High	\$1.28	Free Float	100%
Implied Return	297%	52 Week Low	\$0.30	Avg Daily Value	\$0.3m

Macro Assumptions	% of Rev	FY19E	FY20E	FY21E	FY22E	FY23E
Exchange Rate (A\$/US\$)		0.73	0.70	0.70	0.70	0.70
Premium Zircon	44%	1,450	1,450	1,450	1,450	1,450
Zircon Concentrate	26%	725	725	725	725	725
Primary Ilmenite	30%	-	-	-	95	95
	100%					

Profit & Loss (A\$m)	FY19E	FY20E	FY21E	FY22E	FY23E
Revenue	-	-	-	97	244
Operating Costs	-	-	-	(55)	(126)
Operating Profit	-	-	-	42	118
Corporate & Other	(9)	(6)	(6)	(6)	(6)
Exploration Expense	(0)	-	-	(0)	(1)
EBITDA	(9)	(6)	(6)	36	112
D&A	(0)	(0)	(0)	(5)	(11)
EBIT	(9)	(6)	(6)	30	101
Net Interest Expense	0	1	0	(10)	(24)
Pre-Tax Profit	(9)	(5)	(6)	20	77
Tax Expense	-	-	-	(7)	(23)
Underlying Profit	(9)	(5)	(6)	13	54
Significant Items (post tax)	-	-	-	-	-
Reported Profit	(9)	(5)	(6)	13	54

Cash Flow (A\$m)	FY19E	FY20E	FY21E	FY22E	FY23E
Operating Cashflow	(6)	(6)	(6)	36	112
Tax	-	-	-	-	(13)
Net Interest	0	1	0	(10)	(24)
Net Operating Cash Flow	(6)	(5)	(6)	26	75
Exploration	(1)	-	-	(2)	(4)
Capex	(30)	(108)	(179)	(91)	(23)
Acquisitions / Disposals	-	-	-	-	-
Other	0	-	-	-	-
Net Investing Cash Flow	(30)	(108)	(179)	(93)	(27)
Equity Issue	16	145	2	-	-
Borrowing / Repayments	-	-	184	151	(4)
Dividends	-	-	-	-	-
Other	(0)	-	-	-	-
Net Financing Cash Flow	16	145	186	151	(4)
Change in Cash Position	(20)	33	2	83	44
FX Adjustments	-	-	-	-	-
Cash Balance	3	36	38	121	165

Balance Sheet (A\$m)	FY19E	FY20E	FY21E	FY22E	FY23E
Cash	3	36	38	121	165
Other Current Assets	2	2	2	2	2
PP&E	12	119	298	383	396
Exploration & Development	60	60	60	62	66
Other Non Current Assets	4	4	4	4	4
Total Assets	81	221	402	572	633
Debt	0	0	184	335	332
Other Liabilities	11	11	11	17	27
Net Assets	70	210	207	220	274

Ratio Analysis		FY19E	FY20E	FY21E	FY22E	FY23E
Diluted Shares	m	275	543	547	549	549
EPS - Diluted	Ac	(3.4)	(1.1)	(1.1)	2.4	9.8
P/E	x	n.m.	n.m.	n.m.	24.4x	5.9x
CFPS - Diluted	Ac	(2.3)	(1.0)	(1.0)	4.6	13.7
P/CF	x	n.m.	n.m.	n.m.	12.5x	4.2x
FCF - Diluted	Ac	(13.2)	(20.9)	(33.8)	(10.0)	13.9
P/FCF	x	n.m.	n.m.	n.m.	n.m.	4.2x
Dividends	Ac	-	-	-	-	-
Dividend yield	%	-	-	-	-	-
Payout Ratio	%	-	-	-	-	-
Franking	%	-	-	-	-	-
Enterprise Value	A\$m	161	128	311	378	330
EV/EBITDA	x	(17.7x)	(21.4x)	(51.8x)	10.6x	3.0x
ROE	%	(13%)	(2%)	(3%)	6%	20%
ROA	%	(11%)	(2%)	(1%)	2%	9%
Net Debt / (Cash)		(3)	(36)	147	214	166
Gearing (ND/(ND+E))	%	(4%)	(21%)	42%	49%	38%
Gearing (ND/E)	%	(4%)	(17%)	71%	97%	61%

Reserves & Resources	Valuable HM Grade					
		HM	Zircon	Ilmenite	Hi-Ti	Lcx Leucos
	mt	%	%	%	%	%
Proved	219	13.7	1.02	3.68	0.30	0.28
Probable	529	10.1	0.79	2.87	0.26	0.27
Reserve	748	11.2	0.86	3.11	0.27	0.27
Measured	220	14.5	1.07	3.90	0.31	0.27
Indicated	640	11.8	0.90	3.30	0.28	0.25
Inferred	180	10.8	0.87	3.00	0.27	0.26
Resource	1,050	12.2	0.93	3.30	0.28	0.26

Earnings Sensitivity			FY22E	FY23E	FY22E	FY23E
		A\$m	A\$m	%	%	
Premium Zircon Price	US\$/t +10%	4	11	33%	20%	
Ilmenite Price	US\$/t +10%	2	5	16%	10%	
Exchange Rate	A\$/US\$ -10%	7	18	54%	33%	

Valuation	Discount	Stake	A\$m	A\$/sh
Thunderbird (unrisked)		100%	1,129	3.99
Thunderbird (risk-adjusted)	40%	100%	677	2.40
Night Train		100%	30	0.11
Exploration & Other Projects			15	0.05
Corporate & Other			(73)	(0.26)
Debt			-	-
Cash			2.7	0.01
Option Strikes			0	0.00
Risk adjusted NAV			652	2.31
				0.25

Source: Company data, Blue Ocean Equities

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Steuart McIntyre owns shares in Sheffield Resources.