



SHEFFIELD RESOURCES LTD (SFX AU, \$0.39. Market cap A\$135m)

Our take on the valuation of Thunderbird: Post tax NPV₈ of \$1.1bn.

Our valuation for SFX is now \$1.54/share

Investment overview

We have put together a new valuation model for the now 50%-owned 2 stage Thunderbird project using information in the public domain. SFX has made major progress in improving the Thunderbird flowsheet, with the production of (1) a high value zircon concentrate and (2) an ilmenite concentrate which can readily be sold to sulphate pigment producers and chloride slag plants. This approach substantially enhances the marketability of the Thunderbird product stream.

We have estimated a post-tax NPV₈ at \$1.1bn employing what we think are sensible commodity price assumptions (premium zircon at \$1500/t), and assuming no change to the capex from earlier estimates. Add to this a nominal valuation for the company's exploration assets and allowing for a modest rights issue to raise \$10-15m post FID (likely in 2022, as flagged by the company), our valuation for SFX is \$1.54/share, a significant premium to the current share price.

We see a number of steps which will see SFX rerate toward our valuation. These include:

- Finalisation of the BFS (3-4Q21).
- Completion of the renegotiation of the zircon concentrate offtake (3Q21).
- Renegotiation and completion of ca. \$330-340m in debt with NAIF and Taurus. Thunderbird will then be largely fully funded. 50% partner Yansteel in the new company, Kimberley Mineral sands, is to provide the bulk of the equity required. (3Q21)
- Start of initial construction works (3-4Q21).
- Final investment decision (4Q21).
- Start of construction (1-2Q22).

It is seldom investors have the opportunity to gain access to a Tier 1, high margin, world scale project at a significant discount to its underlying valuation in a commodity sector where sources of supply are mature, and arguably in decline.

A new BFS for Thunderbird

We had expected details of the new BFS to have been released by the time the new Executive Chairman, Bruce Griffin, undertook his recent roadshow. However, as he noted in his presentations, while SFX is in a position to release the final numbers today, the newly configured board feels more comfortable delaying its release until September/October when further value engineering will have been completed and closer to sign-off of a new debt package. We understand negotiations with debt providers are now well advanced.

We have put together a revised valuation of the Thunderbird project, incorporating detail presented during the recent roadshow. The key differences of the currently proposed flowsheet against that proposed in 2019 (the BFS Update) are described below:

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- **Removal of the mineral separation plant** (MSP or dry plant) and acid wash from the circuit with the production of around 210ktpa zircon-rich (“non-mag”) concentrate containing around 39% ZrO₂ (premium and standard zircon), 25% TiO₂ (largely entrained ilmenite) and 1% rare earths-containing monazite. As shown in Appendix 1, we estimate this concentrate will sell for around US\$750/t at a premium zircon price of US\$1500/t. This concentrate represents around 60% of total revenue. Off-take discussions are well advanced, we understand.
- **Re-installation of the low-temperature roaster** (LTR) into the magnetics circuit. This will allow the production of an ilmenite product around 50% TiO₂ compared ca. 40% TiO₂ in the previous magnetic concentrate product. This has been locked in with a take-or-pay offtake agreement with JV partners Yansteel. Should Yansteel not be in a position to take this ilmenite (around 500ktpa), it will be readily saleable to sulphate pigment producers or to the chloride slag industry. At our assumed sales price of US\$200/t, ilmenite would make up around 35% of total revenue.
- This circuit will produce around **250ktpa titanomagnetite**, which we assume will sell for around US\$60/t. This will make up around 5% of total revenue. SFX suggest that Yansteel might be the off-takers for some or all of the material.

The benefits of this flowsheets are as follows:

- Together the MSP and acid wash are relatively costly pieces of the proposed flowsheet (around A\$79m in the 2017 feasibility study, so perhaps over \$90m in the current market). Mr Griffin is of the view that relatively low returns of capital are typically obtained from an MSP. Given the zircon concentrate market is now large (ca. 1mtpa) and counterparty risk is low, he contends that this is the better way to proceed. This product should be eagerly sought as it contains a good proportion of premium quality zircon.
- Simplification of the ilmenite circuit involves the removal of a cleaner circuit prior to the LTR. This has the benefit of reducing capex but also improving recoveries of the ilmenite, thereby increasing tonnages of good quality ilmenite to the LTR.

How will this translate to project capex? Management will not be drawn on this number, no doubt driven by decisions as to which of the project’s components will be outsourced. Mining will certainly be outsourced (and this has been the case in all iterations of the BFS). We’d imagine that power and gas supply, and possibly a camp might be outsourced as well.

There will undoubtedly be swings and roundabouts: the MSP is out, but the LTR is back in. Then there is cost inflation in WA to contend with. Pre-production capex for the 2019 BFSU was \$392m, and management suggests that is likely to be little change to this figure. We have assumed much the same figure and to double throughput for Stage 2, we’ve used the conventional rule of thumb and applied 60% of this figure, or \$240m.

How will this be funded? Equity is now largely out of the way (with a last \$10-15m to be raised by SFX following FID). This is how we see the project is to be funded:

	A\$m	Comments
Pre-production capex, say	390	BFSU was \$392m
Additional funding requirement, say	85	Fees, working capital etc.
Total capital required	475	BFSU was \$478m
Equity		
Yansteel	130	Buy in price for 50%
Sheffield	10	To be raised after FID
Total equity	140	
Debt required	335	Previous debt facilities totalled ca. \$335m

And what of opex? In the roadshow, Mr Griffin stated that SFX is still targeting a revenue/cost ratio at over 2. We have assumed R/C of 2.2 for the first 4-5 years then 1.8 for Phase 2. We think the latter is quite conservative.

What does this deliver? Based on our unchanged long term zircon price assumption of US\$1500/t (which translates to a zircon concentrate price of around US\$750/t) and an ilmenite price of US\$200/t, our NPV₈ for a 37 year mine life is now A\$1.1bn (100% basis). The following table summarises the output from our model against the last NPV presented by SFX (the so-called BFSU).

	BSCP	BFSU*
Zircon price (premium, US\$/t)	1500	1469
FX	0.75	0.75
NPV8 (post tax A\$m)	\$1,101	\$980
IRR, post tax	30.3%	24.0%
Mine life	37 years	37 years
Revenue/cost ratio (years 1-10)	2	>2.3
EBITDA, years 5-10 (A\$m)	\$260	\$250
* SFX BFS Update, 2019		

Translating this to a fully funded valuation per SFX share, we arrive at \$1.54/share, as follows:

Thunderbird (NPV8), post tax	A\$m	\$ 1,101	
Ownership by SFX	%	50%	"Kimberley Mineral Sands"
Thunderbird (NPV8)	A\$m	\$ 551	Fully funded
Dampier project exploration (50%)	A\$m	\$ 20	Notional
Perth Basin exploration (100%)	A\$m	\$ 20	Notional
PV of overheads for SFX	A\$m	-\$ 18	"<\$2m per year"
Cash (at March 2021)	A\$m	\$ 11	
SFX valuation	A\$m	\$ 584	
Number of shares, current	m	346	
New equity required	A\$m	\$ 15	Estimate
Number of new shares	m	42.9	Raised at \$0.35/share
Total number of shares	m	388.9	Post final raise
NAV adding new cash	A\$m	\$ 598.7	
NAV/share	A\$	\$ 1.54	

Points to note here are:

- Significant value might emerge from SFX's tenements in the Perth Basin, particularly the Eneabba project which has a resource of 161mt at 2.5% HM (9.8% zircon, 15% rutile + leucoxene, 61.7% ilmenite).
- The PV of SFX overheads are low compared to our previous estimates. This is because much of the G&A is taken up at the KMS level.

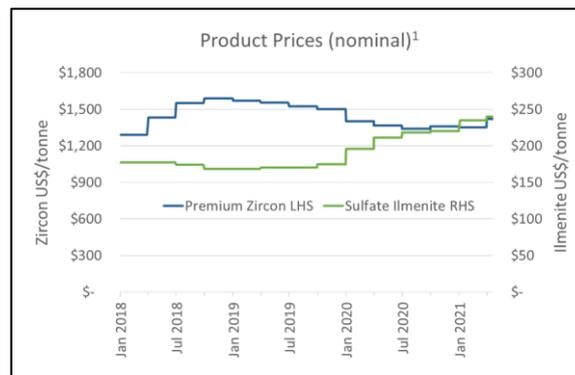
Capital structure and the Board

Sheffield Resources Ltd (SFX AU)		
Share price	A\$	\$0.39
Number of shares (fpo)	m	346.1
Market capitalisation	A\$m	\$135.0
Share options	m	9.6
Cash (March 2021)	A\$m	\$10.8
Debt	A\$m	\$0.00
Top 50 shareholders, appr.		62%
Institutional holding*, appr.		27%
Directors, management		1%
*Includes Yansteel 9.9%		
The Board		
Bruce Griffin, Executive Chair		
Bruce McFadzean, CEO until 1/7/21 then NED		
John Richards, Non-executive director		
Ian Macliver, Non-executive director		
Gordon Crowe, Non-executive director		

Appendix 1. Commodity overview

The mineral sand commodities were early movers in the current cycle, largely responding to supply shortages. Over the past 5 years we have seen progressive production declines from key global mining operations, including the giant Richards Bay dredge/dry mining operation, and from two of Iluka's key operations, Jacinth-Ambrosia and Eneabba. Iluka (ILU:ASX) has been doing a creditable job managing zircon supply with swing production from reprocessed tails from the Eneabba tailings dams.

Zircon prices showed a small impact from the COVID-driven global economic slowdown, but prices for premium zircon really never fell much below US\$1350/t. Since then ILU's supply constraint has allowed the company to obtain a \$70/t price increase last quarter.



Source: SFX presentation, May 2021

For us the most surprising move has been TiO₂ feedstock prices. Since our last report, prices for ilmenite have settled above US\$250/t. This in part reflects a solid demand base from sulphate pigment producers. New Chinese chloride slag smelters appear to be driving chloride ilmenite demand. In an interesting recent development, Iluka have flagged the closure (for 6 months at least) of their Sierra Rutile project in West Africa. This will take some over 100,000 TiO₂ units out of a ca. 7 million tonne market. This is likely to be supportive for feedstock prices in general.

Consultants TZMI have said that there is likely to be a non-captive supply deficit emerging from 2023 unless new projects are developed. We would not rule out further price increases for TiO₂ feedstock prices. The market is tight.

The following table shows our calculation for the approximate pricing of Thunderbird's zircon concentrate. This is based on the zircon and a mixed feedstock content and assumes a payability of around 75%. This translates to a concentrate price of around US\$750/t.

ZrO ₂ content	39%
Gross up to zircon content	59%
Zircon price assumed (US\$/t)*	1400
Value of zircon in concentrate	819
TiO ₂ in concentrate	25%
Value of feedstock mix (US\$/t)	500
Value of TiO ₂ in concentrate (US\$/t)	125
Monazite (approx)	50
Total contained value (US\$/t)	994
Payability (approximate)	75%
Net value of concentrate (US\$/t)	746
*Premium + standard zircon	

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BSCP earned fees from a capital raising undertaken by SFX in 2019.

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Appendix 1

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