



SHEFFIELD RESOURCES LTD (SFX AU, \$0.58. Market cap A\$201m) **BSCP valuation set at \$2.00/share**

Section 1: Our revised KMS/SFX valuation

The final BFS for SFX's 50%-owned world class Thunderbird zircon/Ti feedstock project generated a valuation for SPX of \$1.80/share based on the company's own NPV_s of A\$1.28bn. (See our March 2022 report). We have now had the opportunity to revisit our model with the comprehensive information released by the company. Our valuation for SFX is now \$2.00/share, as follows:

Sum-of-the-Parts	A\$m	Equity	Risk	A\$m	A\$/share
Thunderbird	1,384	50%	100%	692	1.95
Exploration	69	50%	100%	35	0.10
Other Assets	-	100%	100%	-	-
Corporate Costs	(18)	100%	100%	(18)	(0.05)
Net Cash (Debt)	7	100%	100%	7	0.02
Cash from options & new equity		100%	100%	-	-
Total	1,442			715	2.00
WACC					8.0%
FPO Shares					347
Options					2
Performance Rights					5
Fully Diluted SOI					354

This is based on the following assumptions:

- A slightly higher zircon price assumption of A\$1600/t (FOB, real terms), in line with our upgrade some 18 months ago. This translates to an average LOM estimate for zircon concentrate of approximately US\$780/t, a premium to TZMI estimates of around 4%.
- Otherwise our assumptions for the magnetic and paramag concentrates are in line with the TZMI/SFX estimates (around US\$130/t and \$110/t LOM respectively).
- In this report we revisit the exploration potential surrounding the Thunderbird mining lease and have included a modest increment to our valuation for exploration.

Finalisation of debt funding we believe is close. However, with NAIF's involvement there could be a delay during the Federal election process. FID is therefore scheduled for mid-year, but Kimberley Mineral sands (KMS) is well cashed up and ready to continue with construction. Commissioning remains scheduled for late next year with first sales due in early 2024. A revised EPC agreement has been signed with constructors GRES which will be mobilising to site in April.

We see the opportunity to add further value to the Thunderbird project, including:

- The pull-forward of production and cashflows with the acceleration of Stage 2. Our commodity assumptions deliver a combined free cashflow of A\$160m in 2025e and 2026e. This we think could allow the acceleration of the Stage 2 expansion should the market require additional zircon volumes. There is a strong likelihood of this happening, in our view.
- We have completed a detailed comparison with Strandline's Coburn project in this report (see Section 2) and conclude the Thunderbird DFS appears to be conservative and there may be the possibility of lower unit costs than those presented in the DFS.

FINANCIAL SUMMARY

Note that these estimates are for Kimberley Mineral Sands (KMS) where SFX is a 50% shareholder with Yansteel. The structure of this JV will require equity accounting by SFX, and therefore provides little transparency. At this stage we have chosen to display earnings estimates only for KMS and rely on our NPV estimates to provide market value guidance for SFX.

Profit & Loss	Units	Jun-24e	Jun-25e	Jun-26e	Jun-27e	Jul-28e
Revenue (Net of royalties)	A\$m	91	323	356	341	441
Expenses	A\$m	(64)	(156)	(167)	(168)	(202)
EBITDA	A\$m	26	167	190	173	239
D&A	A\$m	(25)	(45)	(37)	(36)	(44)
EBIT	A\$m	1	122	153	138	195
Financing Costs	A\$m	(21)	(25)	(20)	(25)	(25)
Tax	A\$m	(0)	(37)	(46)	(41)	(59)
NPAT	A\$m	(20)	61	87	71	112
Cashflow	Units	Jun-24e	Jun-25e	Jun-26e	Jun-27e	Jul-28e
Cash From Operations	A\$m	26	167	190	173	239
Interest	A\$m	(21)	(25)	(20)	(25)	(25)
Tax	A\$m	(0)	(37)	(46)	(41)	(59)
Working Capital	A\$m	(5)	(13)	(3)	7	(16)
Net Cash From Operations	A\$m	(1)	93	120	113	140
Capex	A\$m	(121)	(18)	(35)	(147)	(83)
Exploration	A\$m	-	-	-	-	-
Acquisitions / Investments	A\$m	-	-	-	-	-
Free Cash Flow	A\$m	(121)	75	85	(34)	57
Borrowings	A\$m	137	(36)	(70)	213	(81)
Equity	A\$m	-	-	-	-	-
Dividend	A\$m	-	(18)	-	-	(166)
Net Increase / (Decrease) in Cash	A\$m	16	20	15	179	(191)
Balance Sheet	Units	Jun-24e	Jun-25e	Jun-26e	Jun-27e	Jul-28e
Cash	A\$m	44	65	80	259	69
Receivables	A\$m	7	27	29	28	36
Inventory	A\$m	5	16	18	17	22
PP&E	A\$m	362	335	333	444	482
Other	A\$m	-	-	-	-	-
Assets	A\$m	418	442	460	749	609
Creditors	A\$m	7	27	29	28	36
Borrowings	A\$m	290	254	184	397	316
Other	A\$m	-	-	-	-	-
Liabilities	A\$m	298	281	213	425	352
Net Assets	A\$m	120	162	247	323	257
Liquidity & Leverage	Units	Jun-24e	Jun-25e	Jun-26e	Jun-27e	Jul-28e
Borrowings	A\$m	290	254	184	397	316
Net Debt / (Cash)	A\$m	246	189	104	138	247
Gearing: Net Debt / (Net Debt + Equity)	%	67%	54%	30%	30%	49%
Net Debt / EBITDA	x	9.4x	1.1x	0.5x	0.8x	1.0x
EBIT Interest Cover	x	0.1x	4.9x	7.6x	5.4x	7.9x

Kimberley Mineral Sands Pty Ltd (SFX 50%)

Key Assumptions	Jun-24e	Jun-25e	Jun-26e	Jun-27e	Jul-28e
Non-mag Concentrate (US\$/t)	852	887	828	759	739
Mag Con (US\$/t)	119	137	133	131	111
NM Finisher mag (US\$/t)	115	117	113	109	104
AUDUSD	0.75	0.75	0.75	0.75	0.75

Production Summary	Jun-24e	Jun-25e	Jun-26e	Jun-27e	Jul-28e
Ore Mined (mt)	3.6	10.6	11.5	11.7	17.9
Waste Mined (mt)	3.9	9.2	9.2	9.2	9.1
Strip Ratio (w.o)	1.1	0.9	0.8	0.8	0.5

Production	Jun-24e	Jun-25e	Jun-26e	Jun-27e	Jul-28e
Non-mag Concentrate (kt)	55	179	209	213	297
Mag Con (kt)	211	654	747	759	1,058
Paramagnetic Concentrate (kt)	23	77	90	91	127

Sales By Product	Jun-24e	Jun-25e	Jun-26e	Jun-27e	Jul-28e
Non-mag Concentrate (kt)	62	212	231	215	293
Mag Con (kt)	34	119	133	133	157
Paramagnetic Concentrate (kt)	4	12	13	13	18
Gross Revenue	99	342	377	361	467
Royalties	(9)	(19)	(21)	(20)	(26)
Net Revenue	91	323	356	341	441
Zircon as a % of revenue	69%	65%	65%	63%	66%

Cost Assumptions	Jun-24e	Jun-25e	Jun-26e	Jun-27e	Jul-28e
Mining (A\$/t ore)	6.0	5.0	4.9	4.9	3.9
Processing (A\$/t ore)	5.1	3.5	3.2	3.2	2.9
Outbound logistics (A\$/t ore)	3.3	3.9	4.3	4.2	3.1
Site G&A (A\$/t ore)	3.4	2.3	2.1	2.1	1.4
Total (A\$/t ore)	17.9	14.7	14.5	14.4	11.3

Operating Metrics (%)	Jun-24e	Jun-25e	Jun-26e	Jun-27e	Jul-28e
EBITDA Margin	29%	52%	53%	51%	54%
EBIT Margin	1%	38%	43%	40%	44%
Revenue/Opex	1.4	2.1	2.1	2.0	2.2
Net Profit Margin	-22%	19%	24%	21%	25%
Revenue/costs	1.4	2.1	2.1	2.0	2.2
Return on Assets	-5%	14%	19%	9%	18%
Return on Equity	-17%	38%	35%	22%	43%
Effective Tax Rate	-2%	38%	35%	37%	34%

Valuation	A\$m	Equity	Risk	A\$m	A\$/share
Thunderbird	1,383	100%	100%	1,383	n/a
Other Assets	-	100%	100%	-	n/a
Corporate Costs	-	100%	100%	-	n/a
Net Cash (Debt)	-	100%	100%	-	n/a
Total	1,383			1,383	n/a
Discount rate					8.0%

Summary

Our NPV₈ for a fully funded Stage 1+Stage 2 development of Thunderbird is now A\$1.384bn with a long term US\$1,600/t FOB zircon price (against the TZMI/SFX estimate of \$1516/t) and FX of 75c with an IRR of 27.5% (both post tax).

Changes to the project's scope now involves the production of 100% mineral sand concentrates rather than final end products. Zircon concentrate is to be sold to Asian concentrators as was announced last year. Thunderbird will also produce an ilmenite concentrate, to be sold at a fixed price to partner Yansteel, thereby removing the need for the low temperature roaster and an upgrading circuit. This not only has the impact of significantly simplifying the process flowsheet, but also reduces the headline capex by 8%.

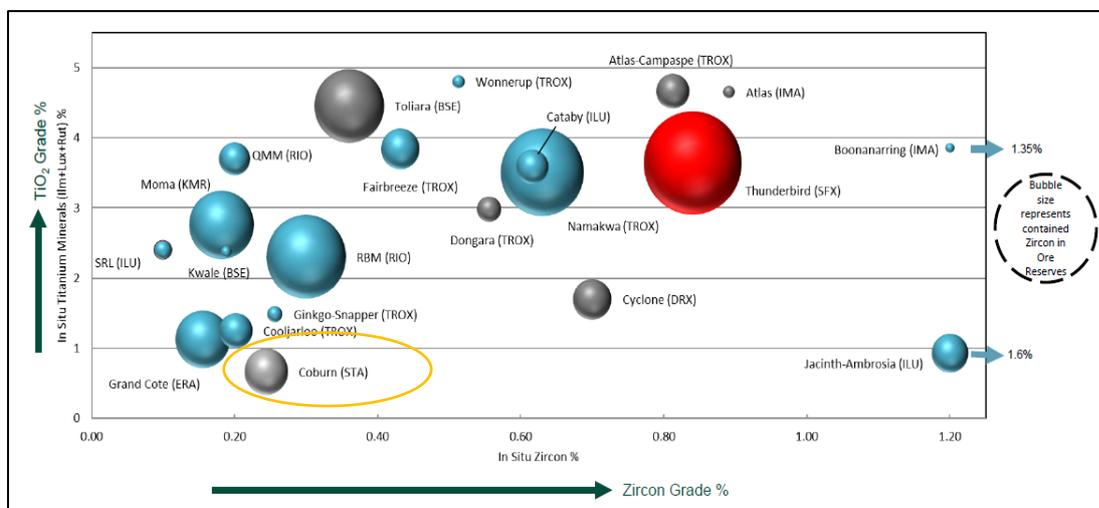
As in previous iterations, the project will be developed in two stages (Stage 2 from Year 5 in the current plan). The mine life is now 36 years in the current configuration. Cash costs have improved slightly, with an R/C ratio of over 2. This is a high margin, long mine life project.

It is important to note that the combination of a lower capital requirement and the sale of non-core assets (which raised ca. \$36m) appears to have removed a requirement for any further equity by SFX. (A modest equity raise had been flagged in previous announcements).

We anticipate continued rerating of SFX as the debt is finalised and as this Tier 1 project moves into production. At the current share price, SFX continues to trade at a significant discount to its underlying value.

Thunderbird is the world's largest reserve of zircon

Thunderbird is now the most significant new source of zircon for the next 3-4 decades at least. The smaller and lower grade Coburn project of Strandline Resources (STA ASX 100%; currently being constructed) is used in this report to provide line-by-line comparisons with the Thunderbird proposal. This is presented in Section 2 of the report.



Source: SFX presentation 2022

The Thunderbird BFS – a simplified, lower capex project with robust returns

New process flowsheet

In summary:

- A two-stage development, initially mining at a 1250 tph rate and expanding to 1750tph from year 5 (largely unchanged).
- Processing rate of 1085tph (Stage 1), duplicated for Stage 2 (unchanged).
- Scrubbing, screening, desliming (unchanged)
- Primary wet concentration followed by concentrate upgrade plant (unchanged)
- Magnetic separation with non-magnetics (mainly zircon) to finisher spirals to produce a zircon-rich concentrate. This section of the flowsheet has been significantly simplified with the removal of a hot acid leach circuit and final dry plant which produced a final pure zircon stream.
- The magnetic fraction reports straight to a TiO₂ rich (ilmenite) concentrate for sale to Yansteel as feedstock for its new pigment plant, currently under construction. This significantly simplifies the flowsheet with the removal of the low temperature roaster and ilmenite upgrading circuits.

The new flowsheet is shown in Appendix 1 at the end of this report. This has resulted in a +8% reduction in capital for the project, with the simplification of the process flowsheet, and a significantly lower start-up risk for the project.

Our production estimates, earnings and cashflow for Kimberley Mineral Sands (100% of Thunderbird) are summarised on page 2 of this report. The following table summarises commodity prices and operating inputs to our valuation for 100% of the Thunderbird project.

Key Assumptions	Jun-24e	Jun-25e	Jun-26e	Jun-27e	Jul-28e
Non-mag Concentrate (US\$/t)	852	887	828	759	739
Mag Concentrate (US\$/t)	119	137	133	131	111
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Mag Concentrate (kt)	34	119	133	133	157
Paramagnetic Concentrate (kt)	4	12	13	13	18
Zircon as a % of revenue	69%	65%	65%	63%	66%
Operating Metrics (%)	Jun-24e	Jun-25e	Jun-26e	Jun-27e	Jul-28e
EBITDA Margin	29%	52%	53%	51%	54%
Revenue/Opex	1.4	2.1	2.1	2.0	2.2

Source: BSCP estimates

Thunderbird can be characterised as a high EBITDA margin project, with revenue/costs at over 2x. This is therefore a top margin quartile project with well over 60% of total revenues in the early years from zircon. The current mine plan provides for a 36 year mine life.

Our commodity price assumptions largely reflect those presented by SFX (sourced from TZMI), with an increase in the base pricing of zircon from year 4 (US\$1600/t against the TZMI long term estimate of \$1516/t).

Concentrate products

- **Zircon:** As already proposed by SFX, the bulk of the project's revenue, zircon, will be sold to Asian concentrators as a non-magnetic concentrate. Key elements are:
 - Around 200,000 tonnes per year (Stage 1) expanding to ca. 300ktpa in Stage 2.
 - Concentrate is made up of around 37% ZrO₂, 26% TiO₂, 1% monazite
 - Binding contracts with 3 customers, 5 years take or pay for 170,000 tonnes per year. Here the price is linked to the market price for contained valuable minerals.
 - Life of mine non-mag concentrate is estimated to make up over 60% of total revenue using BSCP forecasts.
- **Ilmenite:** The recent announcement (March 2022) highlights the removal of the low temperature roaster (LTR) from the circuit. This will result in a magnetic concentrate with the following key features:
 - The production of around 750,000 tonnes per year (Stage 1) expanding to over 1000ktpa in Stage 2.
 - Concentrate is made up of around 39% TiO₂ and >50% total iron.
 - Life of mine mag concentrate is estimated to make up around 30-35% of total revenue.
 - A 100% binding offtake is in place with Yansteel for this material.
- **Other revenue:** Less than 5% of revenue is estimated to come from a so-called paramagnetic concentrate (low Zr, low Ti, medium Fe).

Capital, operating costs, mine life

- Simplification of the flowsheet had enabled the pre-production capex for Stage 1 of Thunderbird to be reduced from that estimated in the 2019 BFSU. Pre-production capex is now estimated at A\$361m (including \$36m spent to March '22 on the BFS and early works). This is some 8-9% lower than the BFSU and has had to absorb quite significant cost inflation which is currently ravaging the WA mining industry.
- The operating costs on an R/C metric have improved slightly, from 2.3 to 2.4 (as quoted by SFX, years 1-10). This cements Thunderbird in the most attractive quartile of the global mineral sands cost curve.
- The mine life is now 36 years, down a year from the BFSU and 7 years from the original BFS. As we know the exploration potential to the south of Thunderbird is excellent. Mine life is the least of our concerns.

Funding Thunderbird

- This is clearly critical for KMS (and SFX), and it has been an issue which has dogged the project for several years.
- We believe debt funding is close to conclusion, with an amount of \$300-320m targeted. This is forecast to cover around 65% of the total funding requirement for the project of \$484m. This is expected to come from NAIF (>10 year tenor) and a source of commercial debt. We would expect SFX to follow the lead set by Strandline (STA ASX) and use Nordic Bonds. NAIF approval is due in 2Q22.
- The following table summarises the sources and uses of funds:

Thunderbird project, sources and uses of funds (KMS JV basis)	
Uses of funds	(m)
Pre-production capex	\$361
Working capital	\$20
Financing costs	\$62
Cost overrun	\$40
	\$484
Sources of funds	
Senior debt (approx. Range \$310-320m)	\$317
JV cash on hand (approx)*	\$105
Additional equity (approx)**	\$62
	\$484
*JV cash at 12/21 was \$107m	
**Contribution from SFX	\$36

Source: SFX presentation and 2022 interim report

- We estimate SFX's cash balance to be currently around \$40m so sufficient to fund a \$36m additional equity top-up for the JV.

The importance of Yansteel as off-takers for the magnetic concentrate

There were eyebrows raised when SFX sold 50% of Thunderbird to a privately-owned Chinese industrial conglomerate, Yansteel. However, not only did this resolve the equity component of Thunderbird, from SFX's perspective, it has provided the opportunity to sell an ilmenite/titanomagnetite/iron concentrate directly to Yansteel at a fixed price.

Those with good memories will draw some parallels with a previous proposal, when SFX was in dialogue with zircon/chemical major Bengbu (a large Chinese SOE, a part of the China National Building materials group). In mid 2019 SFX announced that it had signed an offtake agreement for 100% (around 650ktpa) of an ilmenite/iron rich concentrate direct to Bengbu at a price broadly linked to a global ilmenite price. This was to be used by Bengbu in a yet to be built pigment plant. (We can find no reference to it having been built). This allowed removed of the low-temperature roaster and drop perhaps \$40m from the capex bill.

This strategy could have presented SFX (and its future debt providers) with a risk: if Bengbu did not proceed with the pigment plant, what then happens to the ilmenite concentrate? There might not be an alternative market for that material. So the LTR was re-introduced to the circuit so that a high quality ilmenite concentrate could be produced and sold into the global market, if required.

Roll on 3 years and the new partner, Yansteel, confirmed it would indeed diversify into pigment production and has begun the construction of not only a chloride pigment plant but also the means by which the company can upgrade lesser quality ilmenite feed. The plant is designed to process ilmenite concentrates from a variety of sources, including from Thunderbird.

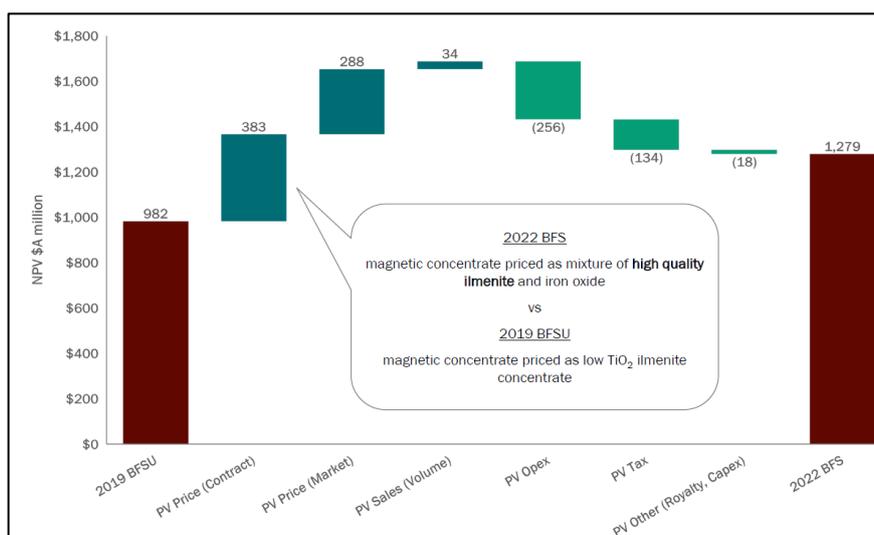
SFX state that pricing of the mag con – clearly a very important outcome of this new offtake agreement – is based on an arms-length fixed price reflecting contained TiO₂ content for an initial five-year period and an arms-length market price for the remaining mine life (should that material be contracted).

In their recent presentation, SFX state that the price achieved will be in the range of US\$119-138/t (FOB) for the first 10 years. If we look back on our earnings/valuation model from 3 years ago, we were then forecasting prices of around US\$125/t for an ilmenite concentrate, but we assumed fewer tonnes were to be sold. So, net/net this looks to have been a positive outcome, and a win/win for both sides. SFX state that the outcome is margin neutral for the JV.

Our take on this is that the outcome is a significant positive for the project:

- The sale of 100% of the mag con is now locked in, pretty well at a fixed price for the next 5 years, take or pay. The bankers will like this.
- The process flowsheet is greatly simplified and what could have been a commissioning issue, the LTR, has been eliminated. Yansteel now takes on this risk at their Chinese plant.
- Start-up risk is reduced.
- Project capex has been reduced.
- Power requirements for the LTR are eliminated, so costs will come down.

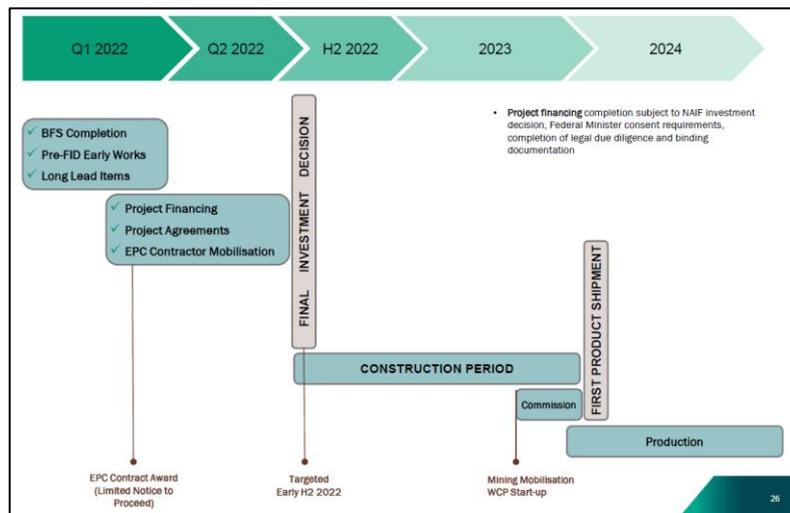
SFX quantifies the impact of the sale of the mag con to Yansteel, compared to the original proposal (in 2019). Based on slightly improved pricing and significantly increased volume, an additional A\$383m of NPV₈ has been added to the value of the project.



Source: SFX presentation 2022

Timetable

- No changes to earlier timetables, with FID early in the June half and with mobilisation to start immediately after the Northern Australian wet (April) with first shipments early 2024. This is summarised with the following chart. The full timetable is obviously contingent on the satisfactory conclusion of the debt package.



Source: SFX presentation

Investment overview

We anticipate continued rerating of SFX as the debt is finalised and as the project moves this Tier 1 project into production.

At the current share price, SFX is trading at a significant discount to its underlying value. Progressive rerating is likely to be driven by the following:

- Finalisation of the KMS debt facility (2Q22) and a final investment decision (FID).
- Commencement of construction (2Q22).
- Commencement of commissioning of Thunderbird (4Q23).
- First sales of product (1Q24).

The greatly simplified flowsheet has not only reduced capital requirements, it also reduces the build time and risks associated with project start up. The removal of the likes of the hot acid wash and low temperature roasting circuits substantially reduces start-up risk. That there is no mineral separation plant is in our view a significant positive.

On top of this we see real upside to our zircon (and therefore zircon concentrate) pricing. We note that Indonesian zircon is now changing hands at US\$2650-2800/t (CIF) basis. While these trades represent quite small tonnages, this price has become a useful lead indicator for larger contractual pricing. We don't think zircon prices (and therefore zircon concentrate pricing) are coming down any time soon.

This represents a very attractive environment to bring Thunderbird into production.

See our March 2022 report for further detail on the commodity price outlook.

To conclude this report, we compare and contrast Sheffield with its 50% interest in Kimberley Mineral Sands (Thunderbird 100%) and the Strandline Resources, now a \$500m market cap emerging mineral sands producer from its Coburn project in WA.

Section 2: A comparison of Thunderbird and Strandline/Coburn

Strandline (ASX STA) took the jump on SFX as it rapidly concluded its debt and equity for the WA Coburn project. This was an excellent achievement.

Coburn represents quite a similar mineral sands concept to Thunderbird, so it is worth comparing and contrasting the two operations from publicly available information to understand the drivers for each project.

The most important characteristics of both projects are summarised in the following table. Note that the comparison is on a project level basis, with SFX owning 50% of Thunderbird.

100% project basis		Thunderbird	Coburn	Difference
TZMI assumptions		SFX 50%	STA 100%	
Reserves				
Tonnes	Mt	754	523	44%
Zircon grade	%	0.84%	0.24%	244%
Contained zircon	Mt	6.3	1.3	396%
Ti grade	%	3.6%	0.67%	447%
Contained Ti feedstock	Mt	27.4	3.5	688%
Mine life	Years	36	22.5	60%
Strip ratio (LOM)	X:1	0.84	0.7	20%
Ore throughput - stage 1	Mtpa	8.7	23.4	
- stage 2	Mtpa	17.4	23.4	-26%
Concentrate production (av. LOM)	Ktpa	1430	220	550%
Zircon production*	Ktpa	146	60	143%
Zircon as % of revenue	%	62%	60%	3%
Capex - stage 1	A\$m	361	260	
- stage 2	A\$m	258	-	
Total capex	A\$m	619	260	138%
Capital intensity/ annual t zircon	A\$/t	4240	4333	-2%
Mining cost/t material moved	A\$/t	2.41	0.63	283%
Mining cost/t mill feed	A\$/t	3.0	1.1	186%
Processing cost/t mill feed	A\$/t	3.8	1.6	142%
C1 cost/t mill feed	A\$/t	11.1	2.7	316%
Basket price/t mill feed	A\$/t	21.7	6.0	264%
Cash margin/ t mill feed	A\$/t	10.6	3.3	222%
Power usage and costs				
Power source		LNG	LNG	
Power station capacity	MW	14.0	16.0	-13%
Average load	MW	8.6	12.0	-28%
Cost of power	A\$/KWh	0.20	0.17	18%
Trucking distance to port	km	148	240	-38%
Revenue/cost**	x	2.1	2.2	-5%
NPV ₈ (post tax)	A\$m	1279	463	176%
NPV/capex		2.1	1.8	16%
IRR, post tax	%	27.5%	28%	-2%
* pure zircon equivalent				
** based on zircon pricing of US\$1516/t FOB, ilmenite, etc as DFS, FX of 0.75				

Source: Company disclosures, BSCP estimates

- STA claims Coburn to be a world class mineral sands export project. (While a solid project, we're not quite sure it meets the conditions of "world class"). It is targeting the production of around 58ktpa contained zircon (comparable to Image's Boonanarring Project) for a 22 year mine life using conventional open pit mining and wet and dry concentration methods.
- Coburn is aiming to produce a premium zircon product from the dry plant as well as a zircon concentrate. By-products will include ilmenite and rutile. We estimate zircon revenues will make up around 60% of Coburn's revenues.

Resources and production

- Thunderbird is a significantly larger deposit with 44% more tonnes in reserves and much higher grades (especially zircon grades: 0.84% vs 0.24% at Coburn).
- This leads to nearly 5 times the amount of contained zircon at Thunderbird, and nearly 8 times the amount of contained Ti feedstock. (Coburn's Ti feedstock is of higher quality than that of Thunderbird).
- This leads to a significantly longer mine life at Thunderbird, based on current reserves. However, note comments below on Coburn's proposed extension, which is stated to deliver a 37 year mine life.
- With the Stage 2 expansion, Thunderbird will be producing over twice the amount of zircon compared with Coburn and doing that with a 26% lower throughput rate.
- Strip ratios for the mines are similar as is the proportion of revenue delivered by zircon (in the case of Coburn pure zircon plus low-grade concentrate; in the case of Thunderbird, high grade concentrate).

Capital

- Total capital for Stages 1 and 2 of Thunderbird is significantly higher than Coburn (+138%).
- However capital intensity expressed on a 'per annual tonne of zircon' basis is almost identical.
- In a recent release STA state that the Coburn project is 65% constructed and is on time and on budget, a creditable result. This bodes well for Thunderbird achieving its capex goals.

Operating costs and cash margins

- This seems to be where the largest differences lie. On a \$/t of material moved, Thunderbird's mining costs are estimated at \$2.41/t against 63c/t for Coburn. Both projects will use dozer trap mining methods.
- We are aware that Thunderbird's ore is harder than typical mineral sand mines and in the upper sections will require ripping by a D11 dozer. However, we find it hard to imagine how earthmoving costs could be nearly 4 times that of Coburn.
- Processing costs appear to be similarly skewed, with Thunderbird nearly two and a half times the cost of Coburn. And Coburn includes a dry plant to produce premium zircon. We are puzzled by this.
- Power costs are important as they could make up as much as 25-30% of total costs. Power will be generated using LNG at both projects, with top up power from solar at Coburn. STA quotes A\$0.17/kwh for its power costs, against 20c for Thunderbird. The reason for the difference is not clear to us but might in part be driven by the use of solar at Coburn.

- Transport costs will be higher for Thunderbird. With 100% of the material shipped as concentrate, Thunderbird will truck over 6 times the volume of Coburn. However, Thunderbird is much closer to a port than Coburn (by around 90km). This we estimate will add 75c/t to Thunderbird's costs per tonne of ore processed compared with Coburn (using a transport cost of 10c/t/km).
- C1 costs for Thunderbird are estimated to be over 4 times that of Coburn. Again, this tests the credibility of these estimates. Has the Thunderbird project had particularly conservative costs applied, or are Coburn costs stretch targets? The transport costs for final product don't make that much of a difference.
- Both projects offer very attractive revenue to cost ratios and if correct, both will be in the highest margin quartile at over 2x. (Note we have recalculated Coburn's economics to the current long term zircon price assumption of US\$1516/t FOB and have used commodity price assumptions from the respective project feasibility studies).
- In total, Thunderbird's margin is A\$10.60/t (revenue – C1 cost) against \$3.30/t for Coburn. The latter leaves less room for error or slippage.

Project economics

- Interestingly the post-tax IRRs are almost identical at 27.5-28%. Based on each DFS, both appear to be feasible projects, and attractive ones at that.
- A common financing metric, NPV/capex, both appear quite attractive with Thunderbird at 2.1x against Coburn at 1.8x. That the Coburn project readily attracted debt suggests to us that Thunderbird should have little trouble.
- Thunderbird's NPV₈ is 2.8x that of Coburn for 2.4x the capex, in part reflecting Thunderbird's longer mine life.
- On the face of it Thunderbird is much the better project, and by our judgement certainly is a Tier 1 asset. Coburn, based on the DFS release, is a very attractive project, but we are concerned that costs may have been underestimated. Time will tell.

(Note added. As we complete this report we note that STA is about to push the button on a scoping study to increase the planned production rate at Coburn by 50%. As well, STA announced the raising of \$50m to fund the scoping study and initial work for its Tanzanian mineral sand assets.)

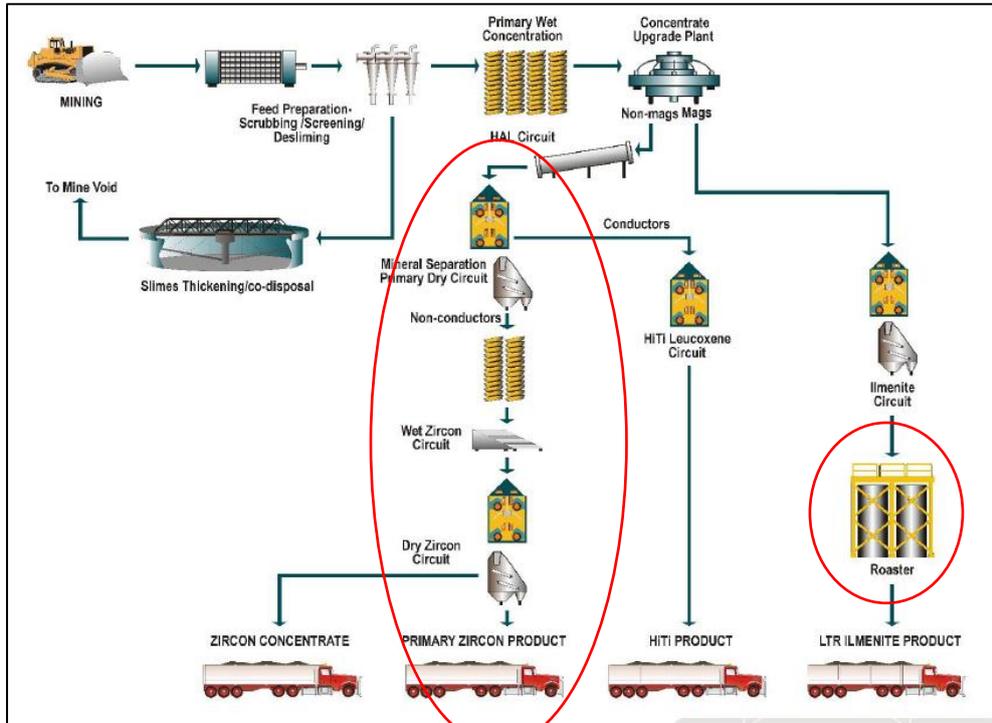
In conclusion, this comparison raises some interesting issues for us. Thunderbird is exploiting the increasingly attractive zircon-concentrate path, eliminating a relatively high capex dry plant. SFX argues that with the emergence of large Asian concentrators, returns from a dry plant don't warrant their installation. We believe that zircon concentrates now make up over 50% of all imports into Asia. This is a very liquid market.

Despite the additional capex for a dry plant at Coburn, capital intensity for both projects is about the same. This gives us additional comfort that the Thunderbird capex is achievable, despite inflationary pressures in the West.

Of greatest concern to us are the large differences in operating cost estimates. We are left to conclude that the Thunderbird DFS has been very conservatively estimated and see the opportunity of even higher margins from this world class project.

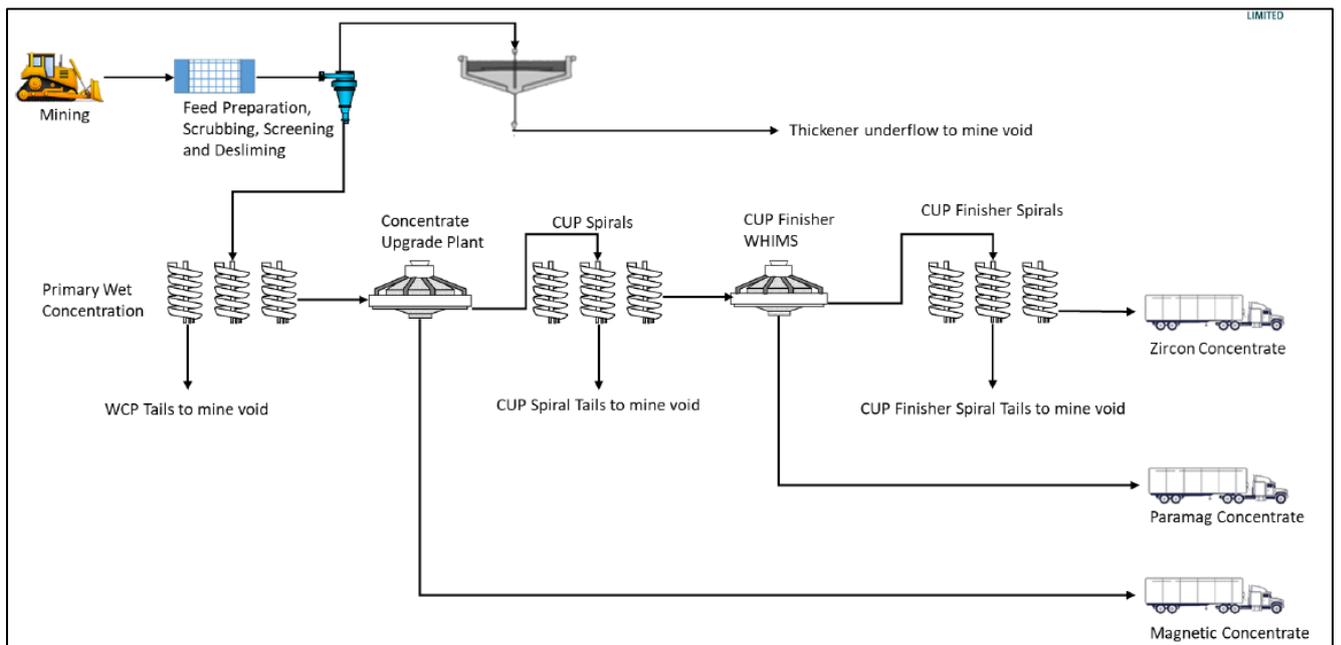
Appendix 1. Significant simplification of the Thunderbird processflow sheet

As Thunderbird's process flowsheet was proposed in 2016:



Source: SFX Diggers and Dealers Presentation, 2016

As it is now:

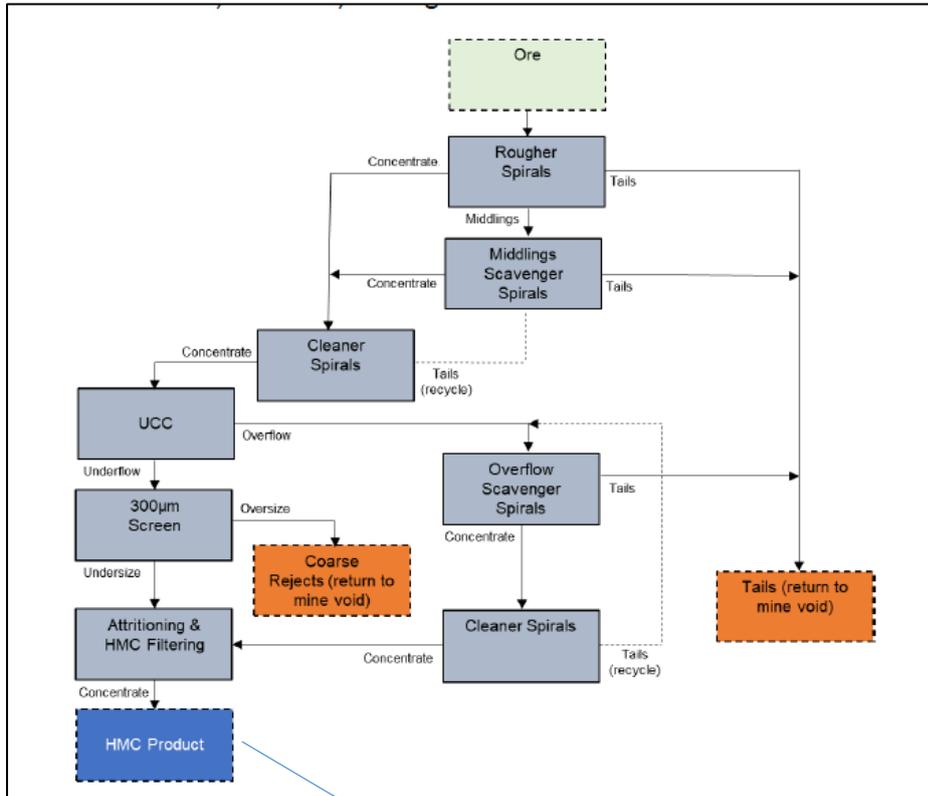


Source: SFX presentation 23 March 2022

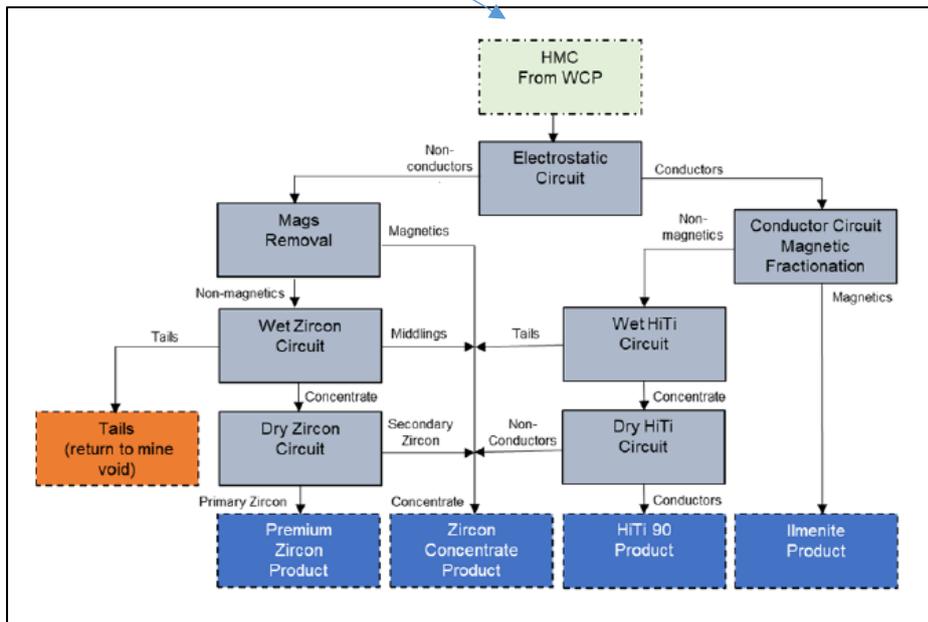
The most important elements of the process design eliminated in the final BFS are highlighted with the red ovals, above. See text for more detail.

For comparison, the Coburn process sheet is summarised below. Note that the revised flow sheet for Thunderbird largely stops at the end of the WCP.

The Wet Concentrate Plant



The Mineral Separation Plant



Appendix 2: The potential for additional value in SFX: regional resource potential

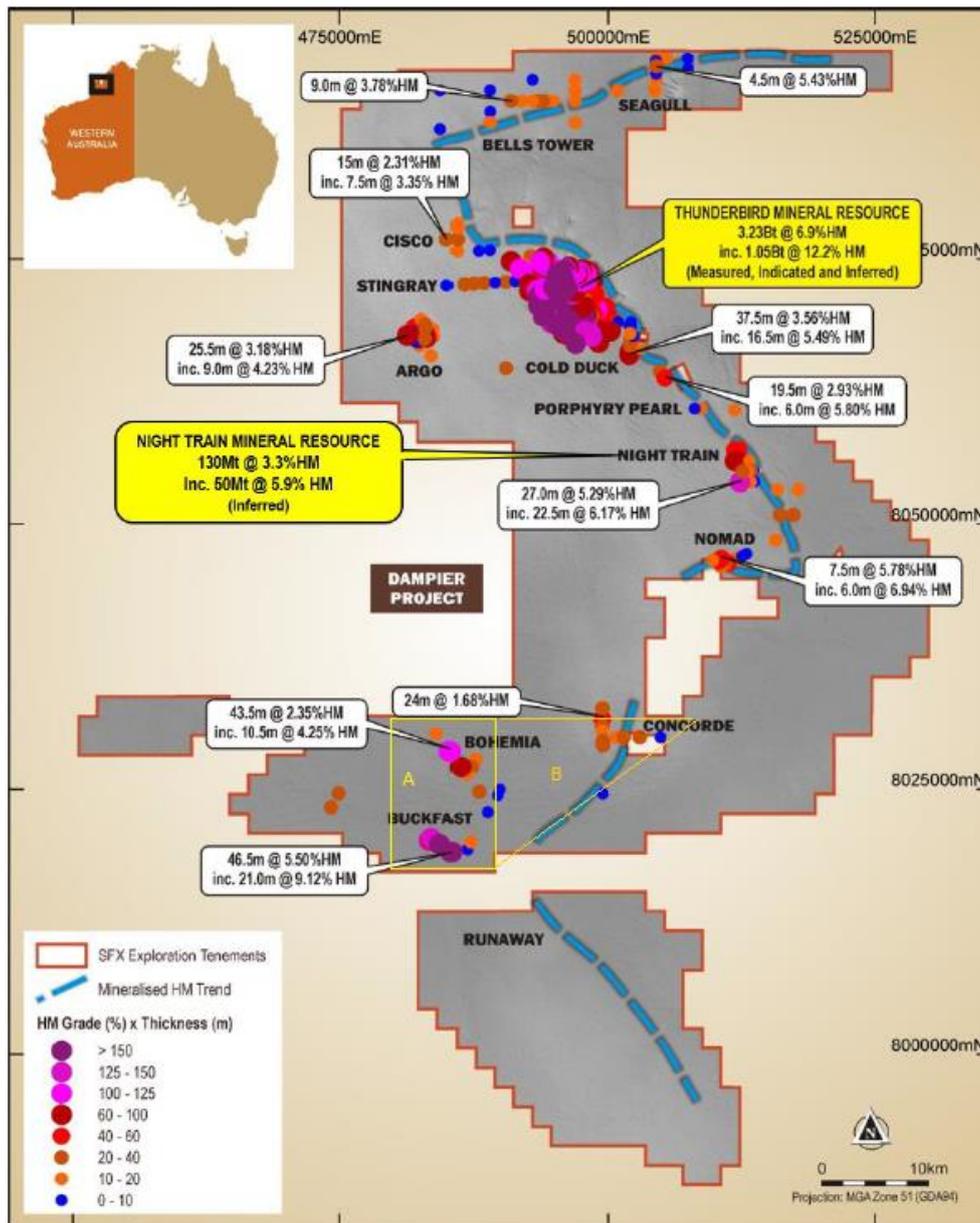
The following section has been taken from our August 2019 report (available on request). It discusses the highly significant additional resource/reserve potential at Thunderbird itself and within adjoining tenements. With its +30 year mine life, additional reserves are hardly an imperative. But the following section does highlight that Thunderbird and its satellites have a huge resource base (3.2Bn tonnes at Thunderbird and 130mt at the Night Train satellite). In addition we can see multiple billion tonne resource potential from other satellite mineralisation. We speculate that Sheffield and its JV partner Yansteel have the potential to become the number one producer of zircon globally for many decades.

We therefore consider our valuation of SFX's 50% share of the exploration projects at A\$69m as highly conservative.

In 2019 SFX released a maiden Mineral Resource for the Night Train deposit, nearby to Thunderbird, which was discovered in 2015 as a part of a regional grassroots exploration programme. Preliminary infill drilling has allowed the determination of a 130Mt @ 3.3% total heavy minerals (THM) inferred resource at a 1.2% THM (total heavy minerals) cut off grade. Within the larger resource is a 50Mt @ 5.9% THM deposit at a 2% cut off grade (COG).

Importantly, as with Thunderbird, the deposit contains a significant proportion of zircon. Night Train's assemblage contains a larger proportion of so-called HiTi minerals (such as rutile and leucoxene). Interestingly, the imputed in situ value per tonne seems to be comparable with and potentially higher than the global Thunderbird resource at this early stage. The Night Train resource at a 2% COG could be of higher insitu value than the Thunderbird Ore Reserve. This is dependent on commodity price assumptions, of course.

The Night Train Mineral Resource demonstrates is the potential to substantially increase the mineral sand endowment of the Dampier Project. Additional resource potential can be seen over an astonishing 160km long mineralised trend extending from the Seagull mineralisation to the north to Runaway to the south, as illustrated on the following plan from SFX.



Source: SFX release “High grade maiden mineral resource at Night Train”, 31 January 2019. Blocks annotated “A” and “B” have been added by BSCP and are referred to below

We believe there is significant additional resource potential within the Dampier Project tenements. SFX’s January report discussed the opportunities in some detail. Regarding regional exploration potential, the company comments as follows:

From its limited regional exploration efforts to date, the Company has discovered mineralisation at a variety of stratigraphic levels, including the Argo and Bohemia prospects which occur above the extensively mineralised Thunderbird stratigraphic position. The different mineralised levels are thought to represent potential stacked shoreline facies that accumulated during marine transgressions in the Cretaceous. This opens up the potential for multiple target horizons on which to focus future exploration programs. (Source: SFX release “High grade maiden mineral resource at Night Train”, 31 January 2019)

In our view the most obvious exploration targets include:

- **Extensions to the Thunderbird deposit**, down dip and along strike. The current Thunderbird deposit is immense, and already one of the largest (if not the largest) accumulations of zircon (with by-product ilmenite and other minerals) globally. It's possible that mineralisation at the Argo prospect, some 10km to the west of Thunderbird, is a down dip extension.
- **Extensions to Night Train**. Under the JORC code, SFX have been able to flag an exploration target of an additional 80-100Mt at 3 to 4% HM, representing extensions along strike and down dip. The deposit remains open in all directions. It's possible that there is some continuity between Night train and the Nomad mineralisation some 8km to the south. It's not hard to imagine that Night Train could become multiples of its current size.
- **Bohemia/Buckfast/Concorde**. Exploration in 2H18 was very successful in identifying future resource targets. As Iluka moved out of the Canning Basin a couple of years ago, SFX geologists slowly accumulated tenements in the south. New discoveries at Buckfast, Bohemia and Concorde were made with deeper drilling than previous explorers, and have been characterised by broad sheet-like geometries, thick (up to 51m) intersections, and mineral assemblages featuring high proportions of valuable heavy mineral (VHM) dominated by leucoxene, altered ilmenite and zircon. Grades of THM are lower than the deposits to the north (1 to 9% THM) but with low levels of iron oxide trash.

A limited number of holes completed thus far has the Bohemia and Concorde mineralisation very close to surface, with Concorde inferred to outcrop to the north. Buckfast, to the south, appears to be overlain by around 50 to 70 metres of cover. Is it possible that the three deposits actually link up? We have done some "back of the envelope" estimates of what could be present. It must be stressed that these numbers are our own, and are in no way JORC compliant nor sanctioned by SFX.

We have considered 2 scenarios:

1. Block A in the figure above, effectively projecting resource potential between Buckfast and Bohemia. Assuming say 25% of a block around 15km by 10km mineralised over a thickness of say 30m and a relative density of 1.8, a tonnage of over 2 billion tonnes could be projected.
2. Taking Block A and assuming that the mineralised zone extends to Concorde (Block B), and again assuming a 30m thickness of mineralisation, 25% mineralised, an additional 1.5 billion tonnes could be projected.

These are large numbers and demonstrate that it's entirely possible that another Thunderbird would fit into Blocks A and B. From the initial work it seems clear that the grades are not yet comparable to the high grade zone of Thunderbird; nor is the tenor of zircon as high. Furthermore, the titanium-bearing minerals are dominated by HiTi minerals (leucoxene and rutile) and the economic potential of both are uncertain. But grades above a THM of 2-2.5% with say 50% zircon and minimal trash are likely to be mineable grades, and with an elevated cut off grade perhaps comparable to Thunderbird.

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Dr Chris Baker, an authorised representative of BSCP, certifies that the advice in this report reflects his honest view of the company. He has 29 years investment experience in wholesale capital markets. He worked as a mining analyst for brokers BZW and UBS for 11 years and has a further 16 years' experience as a mining analyst and portfolio manager with Colonial First State and Caledonia Investments. He now provides independent financial advice on a part time basis. He may own securities in companies he recommends but will declare this when providing advice. He currently owns shares in SFX. He is remunerated by BSCP but is not paid a specific fee for providing this report. BSCP, its directors and consultants may own shares and options in SFX and may, from time to time, buy and sell the securities of SFX.

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Appendix 1

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