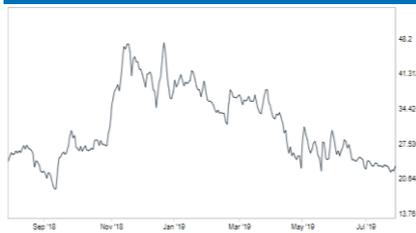


31 July 2019

## BMN LN Mining &amp; Metals



Source: LSE

## Market data

Price (p)	25.6
12m High (p)	50.1
12m Low (p)	18.8
Shares (m)	1,119.1
Mkt Cap (£m)	286.5

## Company summary

Bushveld Minerals is an AIM-quoted mineral resource development and production company. The group's key asset is a majority controlling interest in the Vametco vanadium operation in South Africa. Bushveld also has thermal coal interests via its wholly-owned Lemur Resources subsidiary and tin exposure via a 9.5% stake in AfriTin Mining Ltd.

## Key forecasts\*

	2018	2019e	2020e
Sales (\$m)	192.1	139.7	153.0
EBITDA (\$m)	101.2	59.2	67.7
EBITDA, adj** (\$m)	72.7	42.5	48.8
EPS (\$/sh)	0.03	0.02	0.03
EV/EBITDA (x)	3.1	5.2	4.6
EV/EBITDA adj** (x)	4.2	7.3	6.3
P/E (x)	10.8	14.2	12.1
FCF yield (%)	4.7	11.0	8.6
Net cash (\$m)	42.0	80.2	109.8

\* Do not include proposed Vanchem acquisition

\*\* Equity-attributable adjusted EBITDA

## Analyst contact

Nick Chalmers  
 Email: nchalmers@altrescap.com  
 Tel: +44 (0)20 7186 9003

## Broking contacts

Alex Wood  
 Email: awood@altrescap.com  
 Tel: +44 (0)20 7186 9004

Rob Collins  
 Email: rcollins@altrescap.com  
 Tel: +44 (0)20 7186 9001

## Bushveld Minerals\*

## Much improved Q2 sees Vametco back on track

Operational improvements at Bushveld's Vametco vanadium mine in South Africa saw the highest quarterly production rate in over two years in Q2 2019. If sustained through H2, the run-rate would put Vametco on course to achieve towards the upper end of full-year guidance of 2,800-2,900t V (and we note productivity enhancement initiatives continue to be advanced). The higher rates, and a weaker Rand, saw cash operating costs down 14% in H1 2019, and we are confident full-year guidance of US\$18.90-19.50/kg V will also be met. Given recent vanadium price weakness, the improved operating and cost performance is timely. We expect some price recovery over the remainder of the year, and assuming an H2 average of US\$35-45/kg (versus current spot cUS\$30-35/kg), we estimate Bushveld could generate consolidated EBITDA for the full year of US\$59m. Assuming US\$45/kg flat thereafter, we see EBITDA rising c15% next year as Vametco's production is expanded to Bushveld's interim target of 3,400t, moving to cUS\$100m pa longer-term as output is further increased to over 4,200t pa. This would put the group on a Vametco-expanded EV/EBITDA multiple of just 3x at Bushveld's current share price. With our preliminary analysis of the pending Vanchem acquisition (not yet included in our forecasts) suggesting further material earnings growth as this second producing asset is integrated and expanded, we believe recent vanadium price-driven share-price weakness offers a compelling buying opportunity.

- ▶ **Q2 upturn puts Vametco on course to meet 2019 targets:** Production of 742t V (in the form of Vametco's proprietary Nitrovan product) represented a 14% increase relative to Q1 2019 and an 18% increase on Q2 2018. This improved performance reflects better optimised mine production scheduling and higher kiln feed grades, throughput rates and recoveries. Cash production costs for H1 2019 were US\$17.40/kg V, some 14% lower than H1 2018 reflecting the higher volumes and cost-reduction initiatives, but also a weaker Rand. This improved performance puts Vametco on target to at least meet Bushveld's full-year guidance of 2,800-2,900t V at a cash production cost of US\$18.90-19.50/kg V.
- ▶ **Robust 2019 earnings anticipated despite V price weakness:** Having opened the year at around US\$90/kg (FeV basis), vanadium has fallen sharply across 2019 to date, and is currently hovering around US\$30-35/kg (a price level at which Bushveld states Vametco remains cash-flow positive). While we feel the factors behind this fall may reverse somewhat over the coming months (see pp3-4), we have nonetheless tempered our full-year *average* price expectation to US\$49/kg, from US\$60/kg previously. Accordingly, our full-year Bushveld-level consolidated EBITDA estimate falls by 30% to US\$59m, and **our revised sum-of-parts valuation is 43p**, down from 45p previously (still assuming a long-term FeV price of US\$45/kg, albeit now from 2020 rather than 2021 previously).
- ▶ **Vametco expansion to drive earnings and margin growth thereafter:** Further improvement initiatives are planned to be rolled out over the remainder of the year (for no material additional capex), with a goal of achieving a 3,400t pa rate (being 90% of the single kiln's 3,750t pa nameplate capacity) through 2020. Thereafter, Bushveld hopes to expand nameplate capacity to 5,000tpa (which it expects will facilitate steady-state production of over 4,200tpa), and is currently reviewing the timing and capex requirement to do so. Assuming a US\$45/kg FeV price, we estimate this could lift EBITDA and margin to cUS\$100m and c50% respectively over the next few years.
- ▶ **Vanchem to add further upside:** The proposed Vanchem plant acquisition continues to progress, and Bushveld is confident that all conditions precedent (chiefly competition approval) will be met by the 31 October long-stop date. We await deal-closure and more detailed production and cost guidance before incorporating into our formal estimates and valuation, but our preliminary analysis suggests the acquisition could be 25-50% accretive to EBITDA over the next few years (and potentially more once fully expanded). It would also materially add to our current 43p sum-of-the-parts valuation.
- ▶ **Undemanding valuation:** Bushveld's current EV equates to c5x our estimate of 2019 consolidated EBITDA, dropping to 3x our estimate of EBITDA once Vametco is fully expanded. We consider this is an undemanding valuation given Vametco's multi-decade reserve life and the prospect of further growth to come with the integration and expansion of Vanchem (not yet incorporated in our base-case forecasts or valuation).

### Q2 2019 Vametco operational update

Bushveld’s operational transformation programme began to bear fruit in Q2 2019, with Vametco delivering its highest quarterly production rates in over two years.

Vanadium production totalled 742t (mainly in the form of Vametco’s proprietary Nitrovan product), a 14% increase relative to Q1 2019 and an 18% improvement relative to Q2 of last year. The quarter-on-quarter improvement reflects enhanced mine production scheduling, increased vanadium grade in kiln feed, increased hourly feed rates and improved recovery rates across the plant.

At the Q2 run rate, Vametco is thus firmly on course to meet Bushveld’s unchanged 2019 full-year production guidance of 2,800-2,900t, underpinned by the continued implementation of more productivity initiatives over the course of H2 (a 24-day planned maintenance programme commenced in July, but Bushveld does not expect this to adversely affect its annual guidance).

Cash production costs (before royalties, selling and G&A expenses) for H1 2019 averaged US\$17.40/kg V. This represents a 14% reduction relative to H1 2018, reflecting the higher volumes and cost-reduction initiatives, but also a weaker Rand relative to the year-ago period. We therefore believe Bushveld’s full year cost guidance of US\$18.90-19.50/kg looks eminently achievable, even in the event of some future Rand strengthening.

Vametco posted net revenue of US\$74m in H1 2019 (vs US\$81m in H1 2018) and operations-level EBITDA of US\$49m (vs US\$42m in H1 2018), a margin of over 50% at the H1 market average FeV price of US\$56/kg. Bushveld states that Vametco remains cash flow positive at current market vanadium prices (which we estimate to be US\$30-35/kg on an FeV basis), but that it will continue to focus on cost control/reduction over the second half nonetheless.

Figure 1: Summary Vametco operational forecasts and macro assumptions

Item	Unit	Q2'19	H1'19	Q2'19 vs Q1'19	Q2'19 vs Q2'18	H1'19 vs H1'18
Vanadium (Nitrovan plus FeV) produced	t V	742	1,392	14.3%	18.0%	2.4%
Vanadium sold	t V	607	1,115	19.6%	(14.8%)	(20.5%)
Average market vanadium price	US\$/kg V	39.4	56.3	(46.3%)	(43.1%)	(13.9%)
Underlying production costs*	US\$/kg V	16.4	17.4	(11.7%)	(22.6%)	(13.7%)
Net revenue (after sales commissions)	US\$m	30.0	74.3	(32.6%)	(36.2%)	(8.6%)
EBITDA	US\$m	16.9	48.6	(46.9%)	(35.5%)	14.6%

\*Cash costs before royalties, selling and G&A expenses

Source: Bushveld Minerals

### Expansion update

Continued roll-out of the operational and productivity improvement initiatives at Vametco is intended to support the operation achieving a targeted 3,400t pa sustainable rate from the current single kiln set up during 2020 (3,400t being 90% of the 3,750t pa nameplate capacity). No additional capex is required to deliver this.

Bushveld continues to review the timing and capital investment requirement of an expansion of Vametco’s nameplate capacity to 5,000t, which it expects will be capable of sustaining steady-state production of over 4,200t pa. It is progressing environmental approvals for this next phase of expansion and will shortly commence detailed design and capital cost estimation work with a view to commencing construction next year.

### *Vanchem transaction*

Bushveld's planned acquisition of the Vanchem vanadium processing assets in South Africa (announced in early May) remains ongoing, though the company states that the previously guided earliest possible date for completion (being 31 July 2019) will not now be met as the deal still requires approval from South Africa's Competition Commission. The company is confident that this and all other conditions precedent (including the cession of specific commercial agreements and South African Reserve Bank approval) will be satisfied by the second target date for completion of 31 October 2019.

Bushveld plans to in time feed Vanchem with ore from its greenfield Mokopane vanadium project to the north. To this end the company has commenced a definitive feasibility study of the potential for developing a mine and basic ore concentrating operation, the capital cost of which it continues to believe will be around just US\$20m. Integrating Mokopane with Vanchem should, we believe, enable the project to be developed over a shorter timeframe and at greatly lower cost than if developing it as a standalone operation.

### *Vanadium market update: recent price weakness belies solid long-term market fundamentals*

Vanadium prices have fallen sharply since mid-March, coming off what had hitherto appeared an established plateau around the US\$70-75/kg V (FeV basis) level to a (brief) low of just under US\$30/kg earlier this month. Prices have recovered somewhat over recent days to US\$30-35/kg in Europe, and >US\$35/kg in China. In our view, the downwards volatility reflects:

- ▶ a slowdown in Chinese buying in Q1 2019 following domestic stockpiling in Q4 2018 ahead of the introduction of more stringent steel rebar manufacturing laws (which prompted a spike in prices to an all-time high in late November 2018). Media reports suggest this was exacerbated by a seasonal slow-down in steel manufacturing around the Chinese New Year in February, but also by Chinese steel mills awaiting the implementation in April of an announced reduction in VAT for manufacturers before restocking raw materials;
- ▶ tolerance being shown by Chinese authorities in the stringency of enforcement of new rebar strength regulations, which came into force in November 2018;
- ▶ some substitution with ferroniobium amongst rebar manufacturers given the sharp increase in ferrovandium prices across 2018;
- ▶ and, potentially, some increase in co-production from magnetite iron-steel operations (given haematite iron-ore production interruptions in Brazil) and primary supply from stone-coal (vanadium-bearing shales) operations given the high prevailing vanadium prices through 2018

We continue to believe that these factors will reverse to some degree over coming months. Trading volumes in China are already showing signs of recovery as steelmakers return to the market, and we think regulations on rebar standards will be increasingly enforced over time (driving up specific vanadium consumption rates in China closer to levels prevalent in developed economies). Niobium substitution may be reaching its limit given relative price movements over recent months, and we note that this market is even more concentrated than the vanadium market (with one mine accounting for c80% of supply), potentially limiting its appeal as a long-term feedstock for certain steel types.

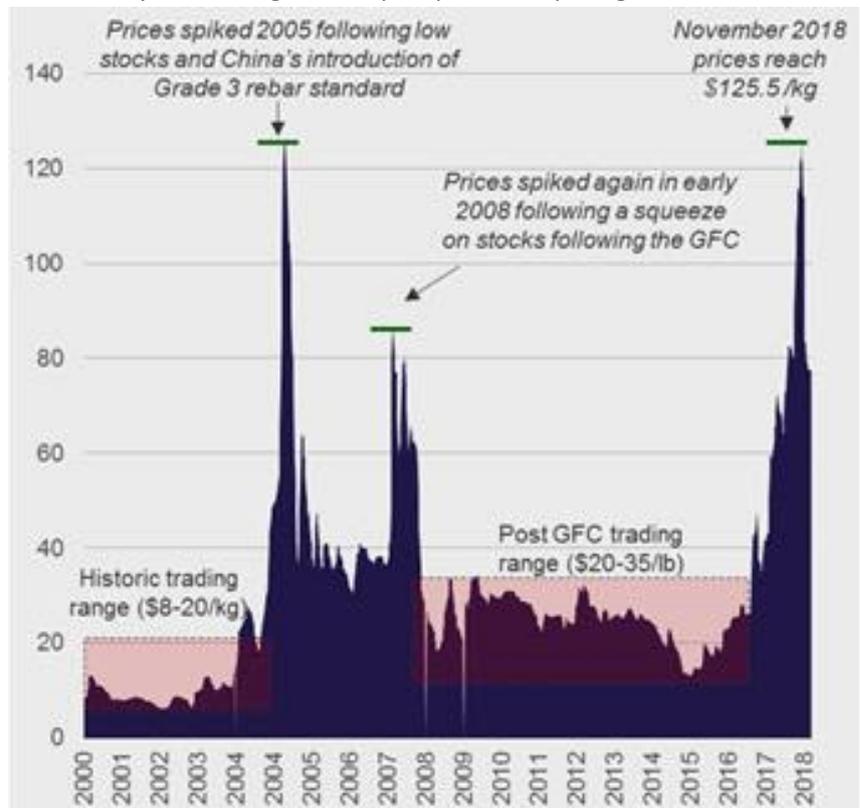
Moreover, the supply-side of the equation remains tight, notwithstanding that some (potentially short-term) increase in co-product supply may have occurred over H1

2019 given events in the iron-ore market. Indeed, we think the sharp pullback in H2 2019 to date could stymie attempts to increase typically high-cost stone-coal primary production (historically a swing source of global supply) and reduce the likelihood of greenfield primary projects attracting development finance.

We therefore remain cautiously optimistic that prices will recover somewhat from current levels in the near-to-medium term, and that long-term ‘normalised’ prices will exceed historic averages owing to the marked structural change in the market that has played out over recent years (greatly diminished co-product supply growth capacity given the global move away from vanadium-bearing magnetite-based steelmaking in favour of non-vanadium-bearing haematite iron-ore-based steel mills). Moreover, we believe that more ‘normalised’ vanadium pricing levels make the economics of the commercial roll-out of vanadium redox-flow battery (VRFB) technology far more compelling than when vanadium was sitting at the elevated levels of late last year. We have long argued that the emerging VRFB end-use market could pick up slack in demand from the traditional steel end-use market given lower vanadium pricing makes the technology far more viable.

Despite being somewhat higher than the ten-year average market price of just over US\$30/kg (and current market pricing of US\$30-35/kg), we thus continue to believe US\$45/kg V to be an appropriate long-term FeV pricing assumption to use in our equity forecasts. However, we have lowered our 2019 FeV price assumption from US\$60/kg V previously to US\$49/kg (reflecting an H2 assumption of US\$35-45/kg, vs the H1 market average of US\$55-60/kg) and brought forward the introduction of our US\$45/kg flat deck by one year to 2020.

Figure 2: Historically, vanadium price spikes have been followed by periods of lower volatility but at a higher than pre-spike mean pricing level



Source: CRU

## Valuation

Incorporating our downwardly-revised near-term vanadium price assumptions, our risked sum-of-the-parts valuation is now 43p (down from 45p previously).

Figure 3: Base-case sum-of-the-parts valuation\*

		Unrisked US\$m	Risk multiple	Risked US\$m	Risked GBP/s
Vametco (BMN attributable)	NPV <sub>10%</sub>	475	1.00x	475	34.7
Mokopane (BMN attributable)	NPV <sub>10%</sub>	307	0.25x	77	5.6
Brits	nominal	25		25	1.8
AfriTin Mining (9.5%)	market	2		2	0.2
Lemur Resources	nominal	10		10	0.7
Corporate G&A	NPV <sub>10%</sub>	(41)		(41)	(3.0)
<b>EV</b>		<b>778</b>		<b>548</b>	<b>40.0</b>
Cash (end-2018)	estimate	42		42	3.0
<b>NAV</b>		<b>820</b>		<b>590</b>	<b>43.0</b>

\*Assumes long-term (from 2020) US\$45/kg V price and R14.00:US\$1 FX rate Source: ARC estimates

We will update our valuation once more detail emerges on the likely operating cost structure of Vanchem and timing of the proposed integration with Mokopane. However, our preliminary analysis suggests the NPV (inclusive of purchase cost) of an integrated Vanchem-Mokopane operation at 4,200t pa is likely to be higher than our current US\$307m (attributable basis) NPV estimate of Mokopane on the standalone 2016 PFS case. Moreover, Vanchem's status as an established producer would greatly reduce the delivery risks attached to our Mokopane valuation (we currently include just 25% of our Mokopane NPV estimate in our risked valuation).

Figures 4 and 5 illustrate the sensitivity of our risked NAV estimate to vanadium price and ZAR:USD exchange rate assumptions. Note that our NAV would remain comfortably positive at FeV prices below current market levels.

Figure 4: Risked NAV (GBP) sensitivity to V price (flat from 2020) and FX rate

		Ferrovanadium price (US\$/kg V)						
		25	35	45	55	65	75	85
USD/ZAR rate	12.00	9	24	39	54	70	86	101
	13.00	11	26	41	57	72	88	103
	14.00	13	28	43	59	74	90	105
	15.00	14	29	45	60	76	91	107
	16.00	16	31	46	62	77	93	108

Source: ARC estimates

Figure 5: Risked NAV (GBP) sensitivity to V price (flat from 2020) and discount rate

		Ferrovanadium price (US\$/kg V)						
		25	35	45	55	65	75	85
Discount rate	15%	10	20	30	40	51	61	72
	12%	11	24	37	50	63	76	89
	10%	13	28	43	59	74	90	105
	8%	15	33	52	71	89	108	127
	5%	20	45	71	98	124	151	177

Source: ARC estimates

## Summary operating and financial forecasts

Figures 6-10 summarise our base-case forecasts for the next few years, updated for our downwardly revised near-term vanadium pricing assumptions. We will update our forecasts once guidance on the operating economics of Vanchem and the planned integration with Mokopane is provided. However, our preliminary analysis indicates Vanchem could be around 25% accretive to EBITDA next year, and around 45-50% accretive to EBITDA across 2021-22 (by which time we believe Mokopane could be contributing ore feed).

Figure 6: Summary Vametco operational forecasts and macro assumptions

		2017*	2018	2019E	2020E	2021E	2022E
Vametco vanadium production	t V	2,649	2,560	2,850	3,400	4,200	4,500
V <sub>2</sub> O <sub>5</sub> equivalent	t	4,729	4,571	5,088	6,069	7,498	8,034
Ferrovandium market price assumption	US\$/kg V	32.60	81.20	49.00	45.00	45.00	45.00
Cash production costs (on-site costs & freight)	US\$/kg V	16.42	19.65	19.20	17.10	15.34	15.00
Total cash costs (incl royalties, marketing & G&A)	US\$/kg V	20.94	31.09	25.91	23.16	21.22	20.80
Operating cash margin	%	30%	59%	47%	49%	53%	54%
All-in costs (incl depreciation)	US\$/kg V	20.96	33.44	28.04	25.03	22.74	22.07
South African Rand	ZAR:USD	13.30	13.20	14.00	14.00	14.00	14.00

\*Bushveld did not assume majority control of Vametco until end 2017

Source: ARC estimates

Figure 7: Summary Bushveld Minerals consolidated income statement

Year-end 31 Dec		2017*	2018	2019E	2020E	2021E	2022E
Revenue	US\$m	2.8	192.1	139.7	153.0	189.0	202.5
Cost of sales	US\$m	(1.4)	(65.3)	(67.7)	(72.1)	(80.7)	(83.9)
Other income	US\$m	0.0	7.4	0.9	0.9	1.2	1.2
Selling & distribution costs	US\$m	(0.3)	(10.7)	(6.8)	(7.6)	(9.4)	(10.1)
G&A and other costs	US\$m	(5.0)	(28.4)	(12.9)	(12.9)	(12.9)	(12.9)
<b>Operating profit/(loss)</b>	<b>US\$m</b>	<b>(3.9)</b>	<b>95.2</b>	<b>53.1</b>	<b>61.3</b>	<b>87.1</b>	<b>96.9</b>
Net finance costs	US\$m	(1.0)	0.8	(0.6)	(0.6)	(0.3)	0.0
Share of profit/(loss) from associates*	US\$m	4.7	0.0	0.0	0.0	0.0	0.0
One-time and non-cash costs	US\$m	(0.7)	(9.3)	0.0	0.0	0.0	0.0
Tax	US\$m	(0.0)	(37.6)	(16.7)	(19.0)	(26.2)	(37.9)
<b>Net profit/(loss)</b>	<b>US\$m</b>	<b>(0.9)</b>	<b>49.0</b>	<b>35.8</b>	<b>41.8</b>	<b>60.7</b>	<b>59.0</b>
Minority interests	US\$m	(0.3)	(18.8)	(11.2)	(12.7)	(17.5)	(17.0)
<b>Attributable net profit/(loss)</b>	<b>US\$m</b>	<b>(1.2)</b>	<b>30.2</b>	<b>24.6</b>	<b>29.1</b>	<b>43.2</b>	<b>42.0</b>

\*Bushveld did not assume majority control of Vametco until end 2017

Source: ARC estimates

Figure 8: Summary Bushveld Minerals consolidated cash flow statement

		2017*	2018	2019E	2020E	2021E	2022E
Operational CF before WC changes	US\$m	(3.8)	70.3	42.4	48.7	67.4	64.7
Working capital changes	US\$m	(1.5)	(25.4)	8.9	(1.4)	(5.9)	(2.4)
<b>Cash flow from operations</b>	<b>US\$m</b>	<b>(5.3)</b>	<b>44.9</b>	<b>51.3</b>	<b>47.2</b>	<b>61.4</b>	<b>62.3</b>
Capex	US\$m	0.0	(11.2)	(9.8)	(15.0)	(6.5)	(3.0)
Other	US\$m	4.4	(17.1)	(2.9)	(2.1)	(20.2)	0.0
<b>Cash flow from investing activities</b>	<b>US\$m</b>	<b>4.4</b>	<b>(28.3)</b>	<b>(12.6)</b>	<b>(17.1)</b>	<b>(26.7)</b>	<b>(3.0)</b>
Equity issue and warrant exercises	US\$m	11.1	23.1	0.0	0.0	0.0	0.0
Net borrowings	US\$m	(0.2)	(6.9)	0.0	0.0	0.0	0.0
Dividends to minorities	US\$m	0.0	0.0	0.0	0.0	0.0	(32.6)
Other	US\$m	0.0	0.0	(0.6)	(0.6)	(0.3)	0.0
<b>Cash flow from financing activities</b>	<b>US\$m</b>	<b>10.9</b>	<b>16.2</b>	<b>(0.6)</b>	<b>(0.6)</b>	<b>(0.3)</b>	<b>(32.6)</b>
Increase/(decrease) in cash	US\$m	10.0	32.9	38.2	29.6	34.4	26.8

\*Bushveld did not assume majority control of Vametco until end 2017

Source: ARC estimates

Figure 9: Summary Bushveld Minerals consolidated balance sheet

		2017*	2018	2019E	2020E	2021E	2022E
Cash	US\$m	9.7	42.0	80.2	109.8	144.2	170.9
P,P&E	US\$m	44.4	47.9	51.6	60.2	60.3	57.6
Intangible assets	US\$m	60.9	57.2	57.9	57.9	57.9	57.9
Other assets	US\$m	45.6	63.6	51.1	53.6	59.6	62.1
<b>Total assets</b>	<b>US\$m</b>	<b>160.7</b>	<b>210.6</b>	<b>240.8</b>	<b>281.5</b>	<b>322.1</b>	<b>348.5</b>
Payables	US\$m	20.2	20.2	16.7	17.8	50.4	60.4
Debt	US\$m	7.8	0.0	0.0	0.0	0.0	0.0
Other liabilities	US\$m	25.3	30.8	31.9	33.1	13.3	13.3
<b>Total liabilities</b>	<b>US\$m</b>	<b>53.4</b>	<b>51.0</b>	<b>48.6</b>	<b>50.8</b>	<b>63.7</b>	<b>73.8</b>
Shareholders' equity	US\$m	70.9	129.9	151.3	177.1	187.2	219.3
Non-controlling interests	US\$m	36.4	29.7	40.9	53.6	71.1	55.5
Total equity	US\$m	107.2	159.6	192.2	230.7	258.3	274.8
<b>Total liabilities &amp; equity</b>	<b>US\$m</b>	<b>160.7</b>	<b>210.6</b>	<b>240.8</b>	<b>281.5</b>	<b>322.1</b>	<b>348.5</b>

\*Bushveld did not assume majority control of Vametco until end 2017

Source: ARC estimates

Figure 10: Key financial measurements and ratios

		2017E*	2018	2019E	2020E	2021E	2022E
EBITDA	US\$m	0.9	101.2	59.2	67.7	93.5	102.6
EBITDA margin	%	30%	53%	42%	44%	49%	51%
EBIT	US\$m	0.1	85.9	53.1	61.3	87.1	96.9
EBIT margin	%	3%	45%	38%	40%	46%	48%
EPS	US\$/sh	(0.00)	0.03	0.02	0.03	0.06	0.06
Net profit margin	%	na	16%	18%	19%	23%	21%
Free cash flow	US\$m	(1.0)	16.7	38.7	30.1	34.7	59.3
Net cash/(debt)	US\$m	1.9	42.0	80.2	109.8	144.2	170.9
EV/EBITDA (fully consolidated)	x	na	3.1	5.2	4.6	3.3	3.0
EV/EBITDA (equity attributable)	x	na	4.2	7.3	6.3	4.5	4.1
P/E	x	na	10.8	14.2	12.1	5.1	5.2
FCF yield	%	na	4.7%	11.0%	8.6%	9.9%	16.9%

\*Bushveld did not assume majority control of Vametco until end 2017

Source: ARC estimates

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Shard Capital Partners LLP  
23rd Floor,  
20 Fenchurch St,  
London, EC3M 3BY

T +44 (0)207 186 9900  
F +44 (0)207 186 9979  
E [info@shardcapital.com](mailto:info@shardcapital.com)  
W [shardcapital.com](http://shardcapital.com)