The Boatman Capital Research

Thungela Resources Ltd: Drowning in Liabilities?

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Anglo American is demerging its thermal coal operations into a new company called Thungela Resources, which will list shares in London and Johannesburg on Monday June 7th. We believe that Thungela has massively under-estimated the environmental liabilities associated with closing its mines, which have just five to 11 years of expected life remaining.

Based on our estimates, Thungela's environmental liabilities could be three times greater than currently reported and are more than the value of the entire company. Our financial model attributes zero value to Thungela. By seemingly underreporting its environmental liabilities, could Anglo and Thungela have misled investors over the true value of these assets?

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Executive Summary

On 7 June 2021, Anglo American (AAL) will demerge its South African thermal coal operations into a new company called Thungela Resources, which will be listed in Johannesburg and London. Investors will receive 1 share in Thungela for every 10 Anglo shares they hold.

We expect there to be immediate pressure on Thungela's share price when the company lists on June 7th as many institutional investors will not want to hold a pure thermal coal producer. We also think that as the scale of Thungela's likely environmental liabilities become apparent, investors will see little to attract them to this stock.

Thungela is required to pay to clean-up the environmental damage from its mining operations. We believe that in its presentations and listing prospectus, Thungela seems to have significantly under-estimated its environmental liabilities and therefore could have given investors a misleading impression of the company's value. Given that Thungela's mines have remaining lifespans of 5-11 years (assuming no extensions), this is now a pressing issue for the company and its shareholders.

Analysts and media have focused on Anglo American's desire to reduce its exposure to greenhouse gas emissions as the reason for Thungela being demerged. We suspect that Anglo has been happy for this perception to persist as it implies its actions are ESG positive. In reality, the demerger allows Anglo to dump enormous environmental costs onto a much less well capitalised company. To us, this looks like greenwashing: Anglo is claiming to be acting positively by reducing its greenhouse emissions while seemingly washing its hands of environmental clean-up obligations.

Thungela has recognised a provision of ZAR6,450 million ($468 million) for end-of-life mine rehabilitation costs. Of this, 55% is unfunded and covered by a guarantee. Thungela has said that it will reduce the unfunded element of its environmental provisions, although it anticipates doing so partly through technologies that will reduce future clean-up costs.

Thungela has based its end-of-life environmental provisions on Department of Mineral Resources and Energy (DMRE) regulations referred to as MPRDA. But new rules, known as NEMA 2015, have been introduced that will impose tougher standards on the mining industry. The NEMA rules were due to be enforced from 19 June 2021 and much of the industry is already using them as a standard. Thungela admits in its risk warnings that the new NEMA rules will "substantially increase" environmental provisioning. The mining industry is unhappy about some details of the NEMA rules and the Government recently agreed to delay enforcement until June 2022, although we understand the areas of dispute will not change the overall direction of travel: much tougher and more expensive environmental standards are being imposed on South African miners.

Given that the NEMA rules were originally due to come into force just 12 days after Thungela's listing, it is surprising that these liabilities were not fully disclosed. According to SRK Consulting, which has provided the independent competent person's reports for six of Thungela's operating mines, work was undertaken in 2020 to "obtain a more accurate assessment of the actual liability" under NEMA regulations. If Thungela has done a calculation on what its "substantially increased" liabilities might be under NEMA, will the company disclose this material information to investors?

Given the apparent lack of disclosure from Thungela, we have tried to estimate what those liabilities might be. We have based our calculations on 3,022 pages of detailed analysis contained in SRK's competent person's reports (CPRs) as well as Thungela's listing prospectus and presentations. In addition, we have been helped by mining and environmental engineers and other mining executives in South Africa. Because Thungela has provided so little detail on how it calculates its end-of-life provisions and the SRK estimates are not always sufficiently detailed, there is a possibility that our analysis includes an element of double-counting. However, there are also numerous items that are seemingly not costed in the CPRs even though SRK suggests they may become liabilities. Overall, we feel that our number gives a reasonable guide to future clean-up costs.

A key cost that will be added to Thungela's environmental provisioning is for water treatment, which is a core requirement under NEMA 2015. Water treatment is necessary as contaminated water from mines can turn local waterbeds and streams highly toxic. Thungela is currently negotiating with the Department of Mineral Resources and Energy (DMRE) to use "passive" treatment – this is one of the technological advances the company has identified that will help reduce clean-up costs. Unfortunately, the mining and environmental engineers we spoke to said that passive treatment should form only a small (10% at best) part of the treatment plan. One expert thought Thungela's position was "untenable" with regards to NEMA compliance, adding: *"The DEA will not negotiate the water provision down. That just won't happen."* Even Thungela's own experts, SRK Consulting, agrees that passive treatment is "unrealistic" and "unproven technology" and that a "more active treatment option will be required".

Thungela has said that if its passive treatment plan is rejected, its environmental provisions may increase by R1,400 million ($102m). We think this is inevitable but massively under-estimates the necessary increase in costs. SRK repeatedly said in the CPRs that it found Thungela's water treatment plans were "not sufficient" and identified multiple additional liabilities. For example, at the Khwezela mine SRK estimated total post-closure water treatment costs at R2,600 million ($189m) – nearly double the R1,400 million that Thungela estimates for all its assets. The additional costs identified by SRK include capex for treatment facilities and annual treatment opex, which is estimated over a 50-year period after a mine closes. Using SRK's worst-case scenarios, we think water treatment could add R7,319 million ($533m) to environmental costs (we assume that this includes the R1,400 million Thungela has already indicated).

Based on the imminent enforcement of new environmental regulations in South Africa and the independent expert analysis provided to Thungela, we believe there could be major additional costs looming for this company. We estimate that total end-of-life environmental costs could be R18,811 million ($1.36bn), nearly three times Thungela's current provisions of R6,450 million and more than the company's book value.

Liability	Provision
Current estimate	**6450**
Thungela estimate of new NEMA Water Treatment costs – assumed to be included in the SRK estimates of water capex and opex below	**(1400)**
Increase from current provision to unscheduled NEMA provision	**+984**
Additional dump cover costs	**+3038 (max)**
Additional water treatment capex	**+896 (max)**
Additional water capex for Zibulo if new facilities required	**+124**
Additional water treatment opex	**+7319**
Total	**R18,811m**

Valuation Model

In the competent person's reports, SRK provides an income valuation, or discounted cash flow model, for each of Thungela's majority owned mines. We believe that a number of adjustments need to be made to SRK's valuation of R10,083 million ($738m) in order to get an accurate sense of Thungela's value. For example, the DCF model does not include central costs, which we calculate at R3,392 million over a 10-year period. There are also guaranteed dividend payments to community and employee groups, who collectively own 10% of the assets, and the additional environmental liabilities outlined above.

We also take issue with SRK's cost of capital assumptions and the price of coal it has used in its DCF calculation. The price of coal is critical to determining Thungela's future valuation and SRK has used forecasts from Wood Mackenzie, which show a price for API 4 category coal of $85.2/t in 2021. Oddly, another firm of analysts came up with a price of $65/t for the same type of coal in 2021. We suspect the price difference is the result of timing. The price of coal jumped at the end of 2020 due, in part, to a cold snap in Asia so forecasts given during that period might have produced a more flattering long-term cost profile. We are not as optimistic about long-term coal prices due to greater competition with other coal producers, notably Australia; efforts to cut greenhouse gas emissions worldwide; and the likelihood of carbon taxes being imposed on coal. We have instead used a price of $68/t as that is the lowest price used in SRK valuation sensitivity tables.

Valuation table:

DCF valuation as per CPR	10,083
Central costs	(-3,392)
SACO Employee Plan Preferred payout	(-90)
Nkiulo CPP Preferred payout	(-24)
Additional Environmental Liabilities	(-12,361)
Adjustments for cost of capital	(-691)
Adjustments for price of coal at $68 long term	(-7,397)
Adjustment for VAT	(-705)
Anglo American 'dowry'	2,500
Total	(-12,077)
Adjust for Thungela shareholders 90% ownership	(-10,870)

Our valuation of Thungela is zero (ZAR 0, USD 0, GBP 0). We anticipate that the company may be able to pay some dividends initially thanks to Anglo's price support and dowry, but we believe beyond that point the dividends will be unsustainable and the true value of the company will become obvious.

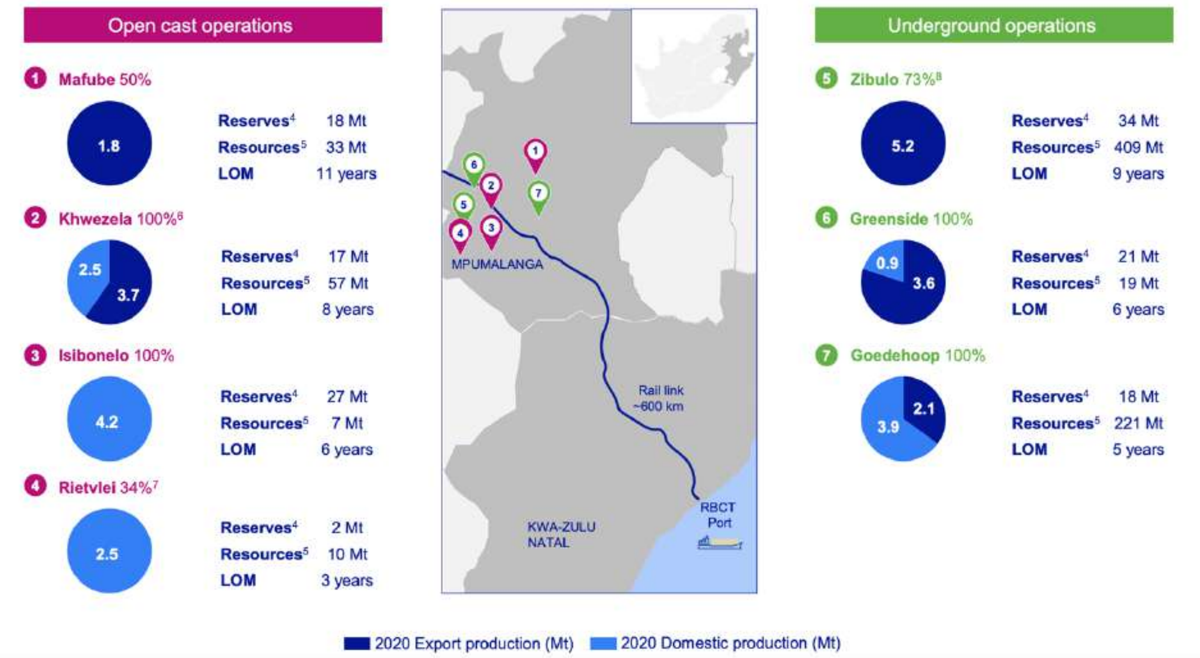
[Our models, detailed analysis and consultations are available at request.]

Thungela Introduction

On 5 May 2021, shareholders in Anglo American (AAL) agreed to a proposal that would see the company's remaining South African thermal coal assets demerged into a new business called Thungela Resources.

Investors will receive one Thungela share for every 10 Anglo shares they hold and analysts estimate that the new company will have a book value of $1.3 billion. Thungela shares will list on 7 June 2021 and will trade with a primary listing on the Johannesburg Stock Exchange and with a standard listing on the London Stock Exchange.

Thungela will own majority stakes in six mines, three open-cast and three underground (Black Empowerment groups have minority stakes in a couple of the mines). Thungela also has a 34% stake in the Rietvlei mine and two development projects.



Source: Anglo American presentation

Most analysts and media commentators have seen Anglo's decision to demerge the South African thermal coal assets as a positive ESG move. Thermal coal, which is burned to generate electricity, is a major contributor to greenhouse gases and, as a result, many large investors are avoiding companies with ties to coal.

"We see this transaction as a positive catalyst; Anglo management is delivering what it promised and working to reduce exposure to an ESG "red flag" commodity."
Source: Bank of America

"It improves the company's [AAL] positioning from an ESG perspective and could possibly broaden the investor base."
Source: JP Morgan

Anglo is sweetening the demerger with a dowry worth $170 million to help Thungela on its way as an independent company. Anglo will also provide support if coal prices fall below certain levels in 2021 or 2022 and the company will continue to market Thungela's coal for the next three years.

Supply and Demand

We think that there will be immediate pressure on Thungela's share price once it lists on June 7th. We expect the volume of sellers to exceed demand for this company's stock for the following reasons:

1. *Investor Migration*

Investors are being given shares in Thungela whether they want them or not. For many institutional investors, Thungela may not fit their portfolio mandate because of size, sector, country risk etc. There is a general expectation in the City that many investors will dump the stock and even Anglo American, which will hold a 9% stake in Thungela, has said that it too will sell out over time.

In a recent investment note, RBC Capital Markets said it expected to see a "fairly rapid shareholder migration" from LSE investors. Bank of America added that it expected to see flowback issues as "some current shareholders of Anglo might not be natural owners of Thungela".

2. *Greenhouse Gases*

As Anglo has found, investors are increasingly wary of companies linked to large greenhouse gas emissions and this trend is only likely to intensify in our opinion. We think a pure thermal coal play will struggle to attract interest from institutional investors. A secondary concern is whether companies such as Thungela will be able to raise financing from banks, who are increasingly under pressure from investors to wash their hands of coal. Without financing options these companies have little future.

Morgan Stanley, for example, has stated in its ESG policies that it will "continue to reduce[1]" its financing of thermal coal projects, although we are not sure how that commitment sits with the bank's role as lead financial advisor on Thungela's demerger and listing.

[1] https://www.morganstanley.com/about-us-governance/pdf/Environmental_and_Social_Policy_Statement_December_2020.pdf

3. Coal Demand

In its prospectus and presentations, Thungela has promoted the idea that coal demand will remain robust, particularly in Asia. The company said that average global coal-fired power generation of 10,200TWh over the next 10 years will exceed 2020's generation total of 9,235TWh[2].

While it is certainly true that Asia will not dump coal overnight, the pace of change in electricity generation is rapid. Geopolitical factors are also reshaping markets, for example Australian coal that might have gone to China is now being directed towards other markets[3], including India - Thungela's prime export market. Coal stockpiles in India are already at record levels[4] and a number of countries are imposing tough restrictions on imports of coal[5]. Other coal markets are also struggling: the price of Colombian coal fell by 40% last year[6]. We are not as optimistic as Thungela that there is a bright export market for seaborne coal and we expect many investors to share this view.

4. Environmental Liabilities

This is the issue that appears to have featured least in analyst coverage of Anglo's demerger of Thungela. But we believe there is a fundamental problem that raises questions about the long-term viability of Thungela as an independent business. Based on our estimates, we think that the company's environmental liabilities exceed the value of its assets.

Given that Thungela's mines have remaining lifespans of 5-11 years (assuming no costly mine-extension projects) this is now a pressing issue for the company and its shareholders.

Thungela lists its end-of-life mine closure liabilities at R6,450 million [$468m] of which 55% (R3,189 million) is unfunded. We believe this figure substantially understates the actual liabilities faced by Thungela, particularly when new environmental laws are brought into force in South Africa. Those laws were expected to be introduced on 19 June 2021 – just 12 days after the listing.

According to our political sources in South Africa, the rules are being deferred one year to allow the mining industry more time to adapt but the direction of travel is clear: the cost

[2] https://www.angloamerican.com/~/media/Files/A/Anglo-American-Group/PLC/products/thermal-coal/demerger/thungela-resources-capital-markets-day-presentation.pdf
[3] https://www.mining.com/web/chinas-ban-on-australian-coal-forces-trade-flows-to-realign/
[4] https://ieefa.org/wp-content/uploads/2021/04/India-Coal-Stockpiles-at-Record-High-at-Close-of-FY-2020_2021_April-2021.pdf
[5] https://www.businesslive.co.za/bd/opinion/2020-11-05-the-future-doesnt-look-bright-for-coal/
[6] https://www.reuters.com/article/us-colombia-mining-idUSKBN2BI35I

imposed on companies to clean up their mess is going to skyrocket. Tucked away in the listing prospectus[7], Thungela acknowledges the risks:

"If the Group's actual mine closure costs significantly exceed its estimates, this may have a material adverse effect on the Group's business, its operating results and/or financial condition…
"It is likely that compliance with the new regulations will substantially increase the required quantum of financial provisioning."

Indeed, the potential end-of-life provisions are so large that one mining industry executive told us that ditching these liabilities was a much bigger priority for Anglo than appeasing investors worried about greenhouse gases.

We suspect that Anglo American has been happy for analysts and the media to focus on greenhouse gases as its reason for dumping Thungela. Investors need to be aware that Anglo appears to be outsourcing to them the incredibly costly and dirty business of closing its coal mines.

So how bad is the problem?

[7] Thungela listing Prospectus p24

Environmental Damage

South Africa has been a centre of global mining for more than a century and this has, unfortunately, resulted in extensive environmental damage. For the coal mines of the Mpumalanga region, the pollution can manifest as sulphur dioxide, nitrogen dioxide and particulate matter in the air. The SO2 and NO2 toxic pollution in areas of Mpumalanga is among the worst in the world[8].

The coal mines also produce water pollution with acid mine drainage (AMD) being a particular issue. AMD can result in groundwater becoming more acidic than vinegar and it leaches heavy metals like lead and poisons like arsenic out of the rock.

The South African government has responded to the growing environmental problems by introducing tougher rules governing how mines operate. Companies are now required to properly provision for end-of-life costs – i.e. what it will cost to treat and clean up pollution and mine sites.

Provisions for rehabilitation are made throughout the life of the mine in preparation for closure and these costs can be substantial.[9] To cover the end-of-life environmental costs, companies are required to set aside "financial provisions for the costs associated with the rehabilitation, closure and ongoing post decommissioning management of negative environmental impacts arising from prospecting, exploration, mining or production activities."[10]

However, the end-of-life costs are so large that environmentalists fear that companies are ditching their assets early in order to escape the liabilities. This leaves the liabilities in the hands of smaller and financially weaker businesses, which may not be able to rehabilitate the environment properly.

David Van Wyk, lead researcher, Bench Marks Foundation:
"We think that there's a big gap in the South African legislation that actually allows big companies to dispose of assets to smaller companies who cannot carry the responsibility to close these mines properly due to a lack of expertise and lack of finances."

Jennifer Broadhurst, Associate Professor, Department of Chemical Engineering, University of Cape Town:
"We already have a huge mess in the gold fields with legacy issues that nobody's taking any sort of real accountability for. And coal is going to be the next one if we're not careful. This is

[8] https://www.greenpeace.org/africa/en/press/7678/mpumalanga-so2-pollution-as-bad-as-no2-new-study-finds/
[9] Financial Provisioning for Rehabilitation and Mine Closure: A study of South African platinum and coal mining companies. May 2018, pp. 8-12.
[10] Thungela-Combined-Pre-Listing-Statement-and-Prospectus, p. 24.

why the red flags came up when I saw the Thungela deal, there's a tendency to pass the parcel with liabilities.
"We have big companies unbundling their liabilities, which are passed on down the line to less and less well-resourced companies that are more likely to just walk away and abandon everything."

There have been numerous examples of gold and coal companies selling assets or declaring bankruptcy and thereby avoiding their environmental obligations. Mintails S.A. was unable to pay the rehabilitation costs for its gold mines and ended up filing for liquidation in 2018, leaving clean-up costs of R460 million at the time[11]. Anker Coal's Golfview Mining entered into administration in 2015 and had to abandon its mines and clean-up liabilities. When Golfview collapsed it reported R622-million in total liabilities, R29-million in environmental rehabilitation costs and only R5-million in a trust fund to pay for the damage[12].

South Africa has seen several large miners sell assets that are nearing the end of their lives, leaving the liabilities to smaller companies that may not have the balance sheet strength necessary to address their environmental obligations properly. As David Van Wyk of the Bench Marks Foundation explained: "If you consider the environmental liabilities and the closure liabilities, you have to question whether any of these mines are actually profitable."

The demerger of Thungela and the transfer of liabilities from Anglo American can be seen in a different light when placed in the context of what is happening in South Africa.

Thungela's Environmental Record

Thungela says it has a robust ESG framework that underpins its commitment to the environment. But close reading of the independent competent person's report produced for each of Thungela's mines shows that there are already significant environmental issues. In most cases, SRK Consulting, which prepared the reports, said that Thungela's management was aware of the problems and was dealing with them.

Some examples include:

- Mafube
    - Excess water at Mafube leads to discharge of contaminated water into the environment

[11] https://oxpeckers.org/2018/08/mintailscollapse/
[12] https://pulitzercenter.org/stories/south-africa-r60-billion-held-mines-are-never-closed

    - Some groundwater contamination currently present
- Goedehoop
    - Mining activities impacting on aquatic ecosystems
- Greenside
    - Surface water risk – Lake Lucy maintenance not in place – risk for spillage if dam embankment fails
- Isibonelo
    - Dirty water discharge from mine due to net excess water within mine, adjacent surface water fair to poor quality.
- Khwezela
    - Not all environmental incidents and spillages are being reported to the DMRE and the DHSWS
    - Water pollution due to seepage especially at Schoonspruit. High risk for groundwater and surface water pollution.
    - Ongoing environmental pollution due to poor management of PCDs.

While significant, these day-to-day issues are dwarfed by the future liabilities that the company faces in cleaning-up its mess after mining ends. This is the environmental issue we believe that investors should be most concerned about.

Environmental Provisions

Thungela is required to make provisions for end-of-life liabilities associated with cleaning up its mess after the mines stop operating, which could be just five years away in the case of Goedehoop. These costs are determined on the assumption that it will take up to 20 years to rehabilitate a mine site and up to 50 years to treat the water post closure. The provisions are based on expert reports and are audited but Thungela admits that the costs are ultimately "based on management's best estimate of the legal and constructive obligations incurred"[13].

As we will show, we believe that in its presentations and prospectus Thungela appears to have significantly under-estimated its environmental liabilities and could therefore be giving investors a misleading impression of the company's value.

Thungela's Estimate of Liabilities

*"As at 31 December 2020, the Group had recognised a **provision of R6,450 million [$468m]** in its financial statements in respect of its financial provisioning obligations."*[14]

As required under law, the Anglo American coal assets have been making financial contributions to dedicated funds that have been established to cover the cost of environmental rehabilitation liabilities.[15] These direct contributions total **R2,902 million [$211m]** and represent 45% of the total provisions required to rehabilitate the Thungela mines.[16] This means that 55% of Thungela's estimated liabilities are unfunded.

Assets held in the environmental rehabilitation trust (B)	2,902	2,742	2,547
Environmental liability coverage % (B/A* 100)	**(45%)**	**(54%)**	**(54%)**

Source: Thungela Combined Pre-Listing Statement and Prospectus, p. 130

Deon Smith, Thungela's CFO, said in a call with analysts on 8 April 2021: "Currently, our liabilities are 45% funded… Our intention is to gradually increase this 45% as we believe that it is a critical element of being a responsible operator." However, as the table below shows, over the past three years Anglo American contributed just R7 million to the rehabilitation trusts with the remaining increase in funds coming from growth in the trust's assets. This is a

[13] Thungela-Combined-Pre-Listing-Statement-and-Prospectus, p. 192
[14] Thungela-Combined-Pre-Listing-Statement-and-Prospectus, p. 24
[15] The SA Thermal Coal Operations exercises full control of these trusts and therefore the trusts are consolidated. The trusts' assets are disclosed separately on the statement of financial position as non-current assets. The trusts' assets are measured based on the nature of the underlying assets in accordance with accounting policies for similar assets.
Thungela-Combined-Pre-Listing-Statement-and-Prospectus, p. 131.
[16] Thungela-Combined-Pre-Listing-Statement-and-Prospectus, p. 131.

very slow way to become a "responsible operator" given that Thungela's mines only have five to 11 years of life left.

It appears that Thungela's management believes that they do not necessarily have to contribute money in order to reduce liabilities. On the same call, Smith mentioned technology for water treatment and topsoil as a means to increase provisions "not only through cash contributions but through all of these mechanisms combined."

According to mining engineers we have spoken to, technological advances will certainly help with end-of-life rehabilitation costs but none thought this would significantly mitigate liabilities in the short to medium term. Indeed, elements of Thungela's water treatment plan have been dismissed as insufficient by its own independent mine analyst – more later.

The movement in the total investments held by the environmental rehabilitation trusts is as follows:

Rand million	2020	2019	2018
At 1 January	2,742	2,547	3,260
Contributions during the year	–	–	7
Disposal of operations during the year	–	–	(810)
Growth on assets	160	195	90
At 31 December	**2,902**	**2,742**	**2,547**

Source: Thungela Combined Pre-Listing Statement and Prospectus, p. 193

Guarantees

To cover the difference between the cash set aside in trust and the total end-of-life environmental liabilities, the thermal coal operations are required to provide financial guarantees to ensure the clean-up can be paid for.

At 31 December 2020, these **guarantees amounted to R3,189 million [$231m]**.[17] The guarantees have historically been underwritten by Anglo American South Africa with the SA Thermal Coal Operations acting as the primary obligor of these guarantees.[18] With the demerger of Thungela from Anglo, those guarantees must now be provided by somebody else and the company states in its prospectus that it is in the "process of entering into agreements with financial institutions to provide financial guarantees to the DMRE to replace the existing guarantees."[19]

[17] Total guarantees in issue (including those amounts specifically designated for immediate closure obligations) amounted to R3,244 million (2019: R3,143 million and 2018: R4,208 million). Thungela-Combined-Pre-Listing-Statement-and-Prospectus, p. 130.
[18] Thungela-Combined-Pre-Listing-Statement-and-Prospectus, p. 130.
[19] Thungela-Combined-Pre-Listing-Statement-and-Prospectus, p. 132.

According to the Thungela prospectus, the guarantees will be provided by South African financial institutions at a cost of approximately 0.8% of the guaranteed amount – or R25.5 million a year based on the 31 December 2020 provision. The company will pay an additional minimum of 5.5% of the outstanding guarantee amount into a "green fund", equivalent to R175 million based on the most recent provision estimate.

> The cost impact to the Group of maintaining the existing financial guarantees is expected to be approximately 0.8% (blended average) of the full value of the guarantees payable annually, and a further approximate 5.5% of the value of the guarantees will be paid annually into an investment account with funds becoming available only when these costs are actually incurred. If the 2019 Financial Provisioning Regulations

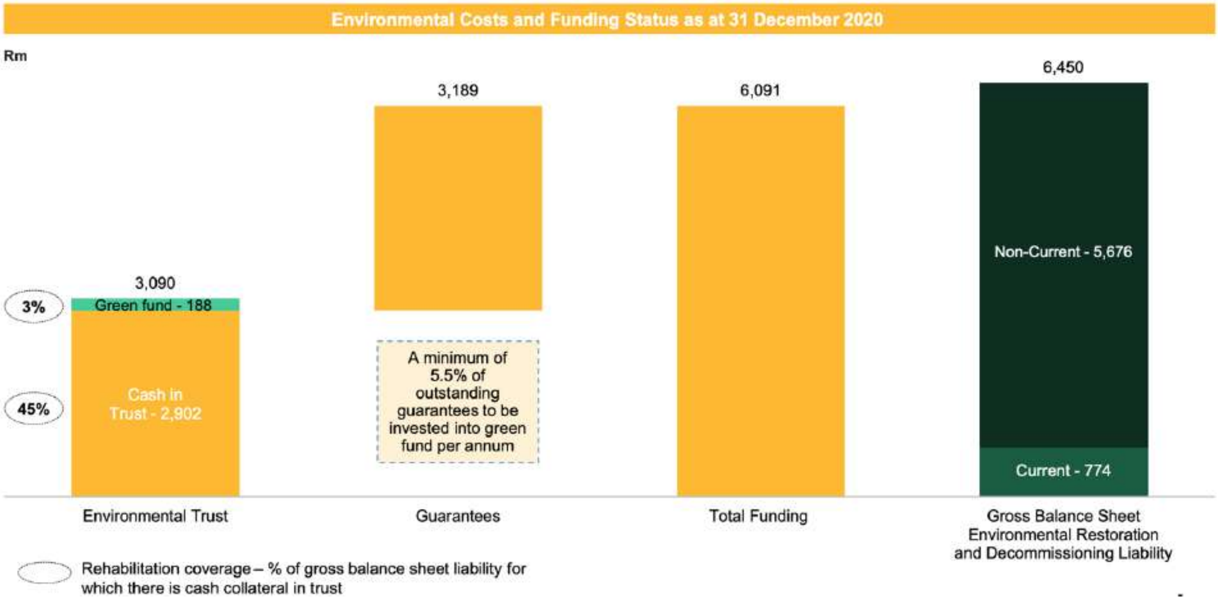
Source: Thungela Combined Pre-Listing Statement and Prospectus, p. 24

According to Thungela, the first annual guarantee fee will be paid using the Thermal Coal Loan from Anglo, which is part of the demerger dowry.

	Year ended 31 December		
	2020	**2019**	**2018**
	R million (unless otherwise indicated)		
Environmental restoration and decommissioning provision	**(6,450)**	**(5,106)**	**(4,760)**
Environmental rehabilitation trust	2,902	2,742	2,547
Guarantees	3,189	2,974	3,749
	6,091	**5,716**	**6,296**

Source: Thungela Combined Pre-Listing Statement and Prospectus, p. 131

As this table shows, Thungela's future environmental liabilities of R6,450 million are greater than the total funding available at R6,091 million. We assume that the company will have to increase its funding via trust payments or increasing the guarantee by at least R359 million to match provisions.



Source: Thungela Capital Markets Day Presentation

Tougher Rules, Regulatory Changes

Prior to November 2015, the calculation of environmental costs was regulated by the Mineral and Petroleum Resources Development Act (MPRDA) and overseen by the Department of Mineral Resources and Energy (DMRE). In an effort to improve air and water pollution, new rules were introduced via the National Environmental Management Act (NEMA) 2015, which will replace certain sections of the MPRDA[20].

There have since been updates to the 2015 NEMA rules with amendments in 2017 and 2019. Companies with existing mining operations were required to comply with the rules set out in the Financial Provisioning Regulations by 19 June 2021.[21] According to our sources, the South African government has agreed to give the mining industry an extra year before the NEMA rules are enforced. While there may be some changes to how liabilities are calculated, nobody we spoke to in South Africa was in any doubt that the tougher NEMA rules would be enforced soon.

Water Treatment

One of the big changes in the NEMA rules has been the requirement for miners to take greater responsibility for water treatment post-closure. This is a significant environmental issue particularly where acid mine drainage exists as this can cause local waterbeds and streams to become highly toxic.

[20] https://www.thungela.com/downloads/Khwezela-Colliery-CPR-dated-25-March-2021.pdf, p.302.
[21]Thungela Combined Pre-Listing Statement and Prospectus, p. 24.

Thungela is currently negotiating with the DMRE to use “passive” water treatment plans rather than more costly “active” treatment as part of its rehabilitation efforts. These plans are among the technical changes referred to by CFO Deon Smith at Thungela’s capital markets day, which the company thinks could help reduce future provisioning requirements. If the company is unsuccessful in getting permission to use passive treatment, it will face dramatically higher end-of-life clean-up costs.

*“Significant engagement with the DMRE is planned for the first half of 2021 to ensure passive water treatment and water treatment plans in general are approved. If this treatment is not accepted before the effective date of the new regulations, the **liability currently provided for may increase by R1.4 billion [$102m]**.”*[22]

Passive water treatment will likely have some role to play in environmental rehabilitation but Thungela is putting far too much faith in these technologies, according to the mining and environmental experts we spoke to. Most of Thungela’s mines produce too much water that is too polluted to be managed by passive treatment techniques alone. According to an environmental engineer who knows the assets well:

“Passive water treatment does not work in coal mining in SA. At best it can cover 10% of all treatment requirements. And it costs 10% of active water treatment. So, it sounds great financially, but it just won't accommodate post-closure, particularly if closure is to happen immediately.”

“Thungela's position is untenable as regards compliance with NEMA. The DEA will not negotiate the water provision down. That just won't happen”

Thungela’s independent expert, SRK Consulting South Africa,[23] appears to agree. (SRK is a world leading author of mineral resource and reserve estimation reports.[24] It has produced independent Competent Person’s Reports (CPR) for each of Thungela’s mines as part of the pre-listing process.) Referring to one part of the Khwezela mine[25], SRK states:

“The costs for Kromdraai may be unrealistic as these are based on a passive treatment solution… Passive Treatment may not prove to be a technology that the authorities are willing to accept as a closure option. SRK therefore, has the concern that Passive Water Treatment may not be the closure solution that the Company anticipates, and the collieries may require Active Treatment.”

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[22] Thungela-Combined-Pre-Listing-Statement-and-Prospectus, p. 174.
[23] SRK was commissioned to compile a Competent Person’s Report (CPR) on Thungela’s collieries (effective date 31 December 2020), to satisfy the de-merger requirements set in South Africa and UK regulation.
[24] https://africanminingmarket.com/independence-underpins-srks-lead-in-reports-ranking/3126/
[25] CPR Khwezela p303

SRK said of plans at the Goedehoop mines:

"SRK is of the opinion that while the Company is investing in research and development related to passive treatment, this is currently unproven technology and still requires significant development to get the technology operational at scale... SRK is of the opinion that the volume requiring treatment postclosure, is unlikely to be compatible with a passive treatment approach… SRK is of the opinion that it is likely that at closure, a more active treatment option will be required."

SRK makes similar statements about passive water plans at other mines and based on these opinions and those from experts we spoke to, we expect Thungela will need to increase its provisions substantially to cover the costs of more active water treatment.

NEMA

The 2015 NEMA rules have been introduced but are not yet enforced while the mining industry and government haggles over some of the terms in the 2019 update. There are apparently disputes over the use of an inflation escalator, addition of VAT and the use of independent auditors. These will be ironed out over the next year before enforcement begins in June 2022.

We understand that many miners in South Africa are already de facto using the NEMA rules for calculating environmental liabilities, although it appears that Thungela chose to use the old DMRE/MPRDA standard in its listing prospectus[26]. While this might be legally acceptable it means that Thungela has left out liabilities (e.g. water treatment) that are already gazetted into law, if not yet enforced. Given that the NEMA rules were originally due to come into force 12 days after Thungela's listing, it is surprising that these new liabilities were not disclosed by the company.

Instead, Thungela has offered a risk warning: "It is likely that compliance with the new regulations will substantially increase the required quantum of financial provisioning made by companies."

The company does admit that the rule changes could impose an additional annual charge but does not detail how this is calculated or quantify what the total provisions might be. *"It is presently estimated that an additional annual charge (costs plus capital provision)* ***of R350 million*** *may arise to the Group, assuming broadly similar terms to what is currently available in the market."*[27]

[26] In each CPR, SRK states that provisions "have been made to the DMRE". E.g. Goedehoop p327.
[27] Thungela-Combined-Pre-Listing-Statement-and-Prospectus, p. 24.

The failure to provide an updated estimate of provisions based on the new rules is odd given that SRK, which produced the independent competent person reports for Thungela's mines, said these were known to the company. SRK wrote: "There is however work that the company is undertaking during 2020 to refine the estimate and obtain a more accurate assessment of the actual liability."[28]

If Thungela knows what its future environmental liabilities might be, why has it not fully disclosed this material information?

Fortunately, we have been able to piece together an estimate based on data buried in Thungela's various listing documents.

[28] Khwezela CPR p374

Underreported Costs of Reclamation and Mine Closure

Thungela acknowledges that environmental provision "estimates are inherently uncertain and could materially change over time."[29] PriceWaterhouseCoopers, the independent reporting accountant, broadly concludes that the process for determining future provisions is reasonable and the estimates are accurate.[30] But the pre-listing prospectus does not provide shareholders with a clear understanding of how the R6,450 million provisions estimate was reached and neither are the additional and imminent NEMA liabilities given much mention.

This apparent oversight means that some potentially very large costs appear to have been excluded from Thungela's end-of-life environmental liabilities. We estimate that the company has therefore dramatically underplayed future environmental costs and could have given investors a false impression of its situation.

We base our assessment on Thungela's own commissioned expert analysis. SRK produced independent Competent Person's Reports for six of Thungela's seven collieries (it does not include Thungela's 34% stake in Rietvlei):

- Zibulo
- Mafube
- Khwezela
- Isibonelo
- Greenside
- Goedehoop

These detailed and technical reports include financial closure provision estimates under three different regulatory regimes: DMRE (unscheduled), NEMA (unscheduled/unplanned)[31] and NEMA (scheduled/planned). As previously discussed, DMRE is the old measure and since 2015 most of the industry has been using the NEMA rules as a benchmark.

Related Financial Closure Provisions Summary*

Item	Related Financial Closure Provision (ZARm)	
	As calculated at December 2019	Adjusted to December 2020[32]
DMRE Assessment (SRK):		
Unscheduled	3,947	4,106

[29] Thungela-Combined-Pre-Listing-Statement-and-Prospectus, p. 131.

[30] Thungela Combined Pre-Listing Statement and Prospectus, Annexe 3A, pp. 210-212.

[31] Unscheduled means the closing of an operation prior to the lapsing of the permission, permit, consent or right. Proposed regulations pertaining to financial provisioning Stakeholder Workshop – Manhatten Hotel 12 June 2019, Department of Environmental Affairs of South Africa, slide 8.

[32] SRK understands that updates to the closure cost estimates are currently being undertaken in order to reflect liability as at December 2020. Once the 2020 assessments are complete and have received the necessary internal approvals, these figures will be reported to the DMRE and changes to the closure provision will be made where necessary. SRK has not interrogated the 2020 figures and has instead escalated the 2019 figures to represent a liability at the end of December 2020.

NEMA Assessment (SRK):**		
Unscheduled/Unplanned	7,150	7,434
Scheduled/Planned	5,164	5,367

*Aggregate data for six collieries (Zibulo, Mafube, Goedehoop, Greenside, Isibonelo, Khwezela). See Appendix I for full tables.
**Excluding VAT

Unscheduled

The NEMA rules require companies to use a liability methodology that calculates costs based on an unscheduled closure. SRK's estimate for unscheduled provisions is **R7,434 [$540m]**, which is R984 million, or 15%, higher than the provisions Thungela has so far reported.

Rehabilitation Work

Additionally, the 2019 revised draft of the Financial Provisioning Regulations requires companies to assume that a third party will be employed to undertake rehabilitation and remediation work. However, the company's 2020 estimate was made on the assumption that such remediation and mine closure activities would be conducted by the Group.[33] SRK points out that it is unknown if this change will increase the amount needed to be set aside but we think it is reasonable to assume so. This requirement could also have implications for VAT, which is added to the clean-up costs.

Additional Liabilities Identified by SRK

SRK has identified a number of other risk items that do not appear to have been included in Thungela's current end-of-life planning.[34] The two main issues are dump management and water treatment.

Additional Liability Arising from Risk Items (SRK CPR of six collieries, ZARm)

	As calculated at December 2019	Adjusted to December 2020
Zibulo:		
Water Treatment (Capex)	121.4	126.3
Water Treatment (Opex ZARm/annum)	6.4	6.7
Illegal post closure activity	*	*
Mafube:		
Dump Covers (estimated total for coarse and fine residue)	85	88
Water Treatment Capex (plant refurbishment/replacement)	50	52
Water Treatment (Opex)[35]	5.5-8.5	5.7-8.8
Illegal post closure activity	*	*
Goedehoop:		
Dump Covers	500-600	500-600
Water Treatment (Capex)	188-500	188-500
Subsidence	*	*
Impact of discard on aquifers	*	*
Bankfontein Dam Remediation	*	*

[33] Thungela-Combined-Pre-Listing-Statement-and-Prospectus, p. 24.
[34] See Appendix I for full data.
[35] ZARm/annum as understood from SRK's estimates found p.235 of the Mafube Colliery CPR.

	As calculated at December 2019	Adjusted to December 2020
Illegal post-closure activity	*	*
Greenside:		
Dump Covers	250-350	250-350
Water Treatment[36]	20-70	20-70
Clydesdale pan	*	*
Illegal post-closure activity	*	*
Isibonelo:		
Water Treatment (Capex)	99.2	103.2
Water Treatment (Opex ZARm/annum)	4.6	4.8
Illegal post-closure activity	*	*
Khwezela (based on DMRE Estimate):		
Dump Covers	-	1,000-2,000
Closure of Yellow Boy dams	-	10-75
Water closure rehabilitation	-	*
Shortage of closure covers	-	*
Subsidence	-	*
Post-closure decant water treatment (constant terms LoM total)	-	*2,616*
Estimate for Capex (2021)	-	115
Estimate for annual Opex (ZARm/annum):		
Years 2022 to 2025	-	12
Years 2026 to 2027	-	36.6
Years 2028 to 2033	-	68.3
Years 2034 to 2059	-	75.7
Total Dump Covers:	**835-1,035**	**1,838-3,038**
Total Water Treatment (Capex):	**458-770**	**584-896**

*cannot quantify / unquantified.

Dumps

SRK estimates additional liabilities for "Dump Covers" at a total cost of between **R1,838 million** and **R3,038 million [$134m-$221m]**. This alone would increase Thungela's end-of-life environmental provisions of R6,450 million by 28% to 47%.

According to SRK, there are existing provisions for discard facilities – the enormous piles of rock that are left behind after mining – and the cost of maintaining these dumps is based on DMRE estimates. But SRK believes that the current environmental protections have had "mixed" results and "may not be successful", which is hardly an endorsement of Thungela's current environmental standards.

Thungela's dump maintenance has also not been tested by the regulatory authorities and "may not meet the requirement" of the relevant laws. "Should the regulators require a more complex closure solution… there is the potential that the closure costs associated with the

[36] A pump and treat system may be required to mitigate the operational impacts from the discard facilities. Should a groundwater management requirement manifest, the quantum of the closure liability could increase by ZAR20 to ZAR70 million. Greenside Colliery CPR, p. 216.

discard facility could increase materially," SRK concluded. For example, at the Goedehoop mine, SRK said that "post-closure planning underestimates liability associated with discard facilities.[37]" Based on these reports, we think Thungela may have significantly underestimated how much it needs to spend on managing its mine dumps.

Water Treatment

As previously noted, water treatment has become an increasing focus for environmental regulations in South Africa. Water treatment has not been included in Thungela's DMRE/MPRDA estimates of end-of-life liabilities but will be added once the NEMA rules come into force. The company estimates that this could increase provisions by R1,400 million if its passive water treatment plans are insufficient.

However, even the estimated increase in liabilities of R1,400 million appears a lowball based on SRK's assessment of treatment requirements. Thungela's independent expert found repeated examples where the company's water treatment plans were insufficient:

- Zibulo
  - *"Post closure water treatment planning not sufficient"*
- Mafube
  - *"Post closure water treatment planning not sufficient and constitutes a significant liability to manage in perpetuity"*
- Goedehoop
  - *"Risk of post-closure water discharge into the environment"*
- Greenside
  - *"Risk for contaminated groundwater post closure."*
- Isibonelo
  - *"Post closure water treatment planning not sufficient"*
- Khwezela
  - *"Water pollution due to seepage… high risk for groundwater and surface water pollution"*

At Isibonelo, for example, SRK said: "The water treatment facility presents a significant financial liability during operation and post-closure." It added that post-closure there was a risk of contaminated water decanting into the groundwater, which would need to be treated and managed "in perpetuity".

According to SRK, additional liabilities related to Water Treatment Capex is estimated at between **R584 million** and **R896 million [$42m-65m]**.

[37] SRK Goedehoop Colliery CPR, p259.

Water treatment is such an important financial issue because pollution can take decades or centuries to clean up. The treatment must be done on a very long timeframe and at considerable expense, which SRK has estimated as Water Treatment Opex costs.

These opex costs vary from colliery to colliery depending on estimated years of life and remediation obligations. However, for the Khwezela mine alone, SRK estimates total post-closure water treatment cost of **R2,600 million [$189m]**. Of this only R115 million was for capex, meaning nearly R2,500 million for ongoing treatment opex.

SRK has not estimated the long-term treatment costs for other mines other than giving an annual estimate for some facilities. However, Thungela states in its prospectus (p192) that it anticipates water treatment will be required for up to 50 years. Based on this, we can give an estimate of what long-term water treatment might cost Thungela at its other mines.

Mine	**SRK estimate of annual water treatment OPEX Rm**	**Total over 50 years based on static costs Rm**
Zibulo*,**	6.7-30	335-1500
Mafube		5.7-8.8
Goedehoop***	40-60	2000-3000
Greenside*		20-70
Isibonelo	4.8	240
Khwezela*		2500
Total worst case:		**R7,319m**

*Khwezela, Greenside and Zibulo all use the eMalahleni treatment facility. Thungela is still determining post-closure requirements so no provision for capex/opex included in closure cost estimates.
**R6.7m opex p/a if using the existing eMalahleni facility but if this is not workable, additional capex of R200-250m and opex of R20-30m p/a required.
***Assuming passive treatment insufficient.
Source: SRK reports and see Appendix 1

It is not clear how much of the water treatment capex and opex costs identified by SRK are included in the R1,400 million of additional liabilities identified by Thungela if its passive treatments are insufficient. We will assume that the R1,400 can be found somewhere within the SRK assessment of additional liability and therefore deduct it from the total to avoid double counting.

Impact of Additional Liabilities

Based on the imminent enforcement of new environmental regulations in South African and Thungela's own expert analysis, we believe there are major additional costs looming for this company.

Assessing the costs of rehabilitation and remediation of environmental damage is a complex undertaking. While Thungela acknowledges in broad terms the existence of additional liabilities, much greater clarity than is available in the pre-listing prospectus is needed for shareholders to understand how these liabilities will impact the company's balance sheet.

We have estimated total environmental liabilities using the additional costs imposed by NEMA and identified by SRK and Thungela. Explanations for each of these items is given in above sections.

Liability	Provision
Current estimate	**6450**
Thungela estimate of new NEMA Water Treatment costs – assumed to be included in the SRK estimates of water capex and opex below	**(1400)**
Increase from current provision to unscheduled NEMA provision	**+984**
Additional dump cover costs	**+3038 (max)**
Additional water treatment capex	**+896 (max)**
Additional water capex for Zibulo if new facilities required	**+124**
Additional water treatment opex	**+7319**
Total	**R18,811m**

Unfortunately, Thungela has provided almost not clarity on its environmental liabilities other than offering the R6,450 million provisioning figure. As a result, we do not know whether our estimate includes an element of double-counting or whether the SRK estimates are fair or fully costed. However, Thungela has chosen not to give investors liabilities based on NEMA (despite their imminent enforcement) so we have no choice but to do the calculation ourselves.

Putting together all the additional liabilities, we find that Thungela's total end-of-life provisions could triple from the current number of R6,450 million to **R18,811 million [$1.36bn]** (not including inflation or VAT).

Given that these mines are only currently expected to operate another 5 to 11 years, Thungela does not have long to generate the cash required to meet its end-of-life obligations. Based on the potentially huge increase in provisions outlined above, we think it fair to assume that annual costs associated with end-of-life provisioning will need to increase. That could mean larger guarantees but also additional payments to the trust fund, both of which would limit the company's free cash flow (which has been negative for the past two years) and make future dividend payments unlikely.

Thungela Resources: Valuation

As well as the listing prospectus, the company provides competent persons' reports (CPRs) for six of the current mines and two of the development projects it owns. We have used these as starting points for our valuation, and then made a number of adjustments for:

I. central costs
II. minority interests
III. pending regulatory changes in South Africa;
IV. other costs identified in the CPRs but not including in Thungela's provisions;
V. guarantees vs provisions
VI. cost of capital
VII. price assumptions
VIII. covering liabilities for minority shareholders
IX. adjustment for VAT
X. life of mine

Each of these issues is detailed below.

Competent Persons' Report (CPR) Valuations

			CPR valuation of mine adjusted for economic interest to Thungela		
	Mine	Competent person	Based on DCF		
			Preferred by CPR	Minimum	Maximum
Underground					
	Greenside	SRK	3,526	2,941	3,941
	Goedehoop	SRK	1,354	988	1,757
	Zibulo (UG / OC)	SRK	4,900	3,706	6,088
Open-cast					
	Isbonelo	SRK	464	168	489
	Khwezela	SRK	(-1,908)	(-2,556)	(-1,223)
	Mafube	SRK	1,211	930	1,491
New projects					
	Elders	Uwazi	456	294	934
	Dalyshope	SRK	80	130	560
Total value			10,083	6,601	14,037
Note:	For Dalyshope and Elders, market and cost based approaches are used for the valuation				

Table: Summary of valuations from the competent persons reports (Boatman Capital analysis)

The majority of the reports use an income approach to valuation which financial investors would recognise as a discounted cashflow model (DCF). The development projects are valued using a market-based and a cost-based approach.

It will be seen from the above table that the CPRs, covering the majority of the assets, provide a valuation of R10,083 million ('CPR valuation'). However, we believe that there are a number of adjustments that investors need to make to this valuation.

[SRK's competent persons report also includes market-based valuations (i.e. valuations based on historic transactions). In many ways we believe that these market-based valuations (which are generally lower than the DCFs) are likely to be more realistic. However, we will base our estimates on the DCF as that is the number used by the CPR.]

The assets not covered by the competent persons reports include:

- Richards Bay Coal Terminal (23.2% stake)
  - Since this also involves a take or pay contract and will require investment to allow other bulk commodities to be exported from it we believe the overall impact to the valuation is negligible
- Phola Coal Processing Plant (50% stake)
  - Since this plant is dependent on the outputs of the company's mines we do not believe that it has significant independent value (although there may be additional 'clean-up' liabilities when commercial operations finish).
- Rietvlei Colliery (33.3% economic stake)
  - The group has a 66.6% stake in Butsanani Energy which in turn owns 50% of Rietvlei Colliery – hence an indirect 33.3% economic stake. We do not have an explicit valuation of this asset but do not believe it will have a significant impact on the overall number.
- Colliery Training College (Pty) Ltd (55.4% stake)
  - We believe that this does not have a meaningful impact on valuation

Factors Impacting Valuation

Central Costs

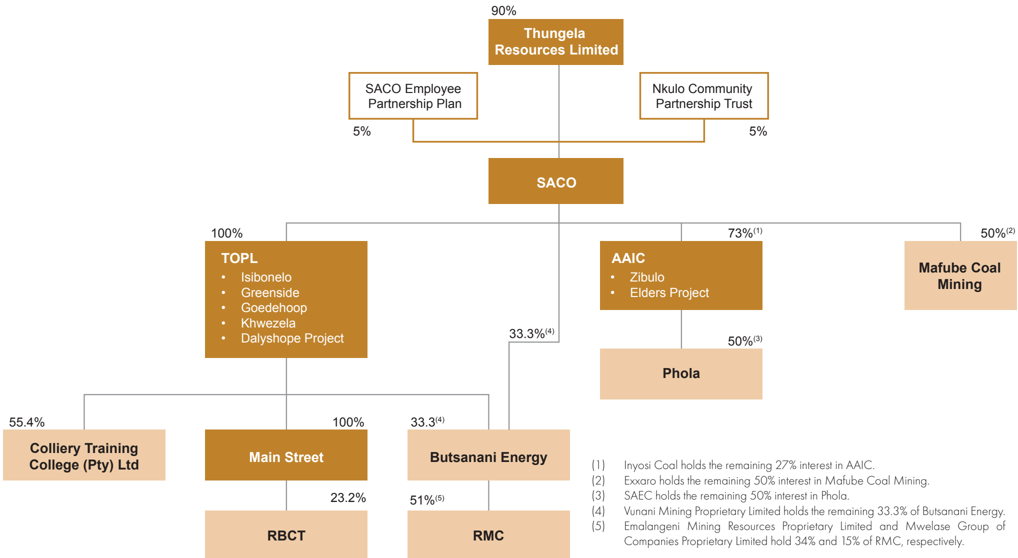
The SRK valuation does not include corporate overheads. The company has indicated that these will start at circa R800 million per year. The company is aiming to reduce costs over time so we estimate that these could reach R600 million per year. Discounting these using the CPR estimates for weight adjusted cost of capital (WACC) of 10.7%, in perpetuity, shows an expense of R5.6 billion. Alternatively, if we assume 10 years of costs before the company has to radically restructure the impact is R3,392 million. Using the SRK valuation and adjusting for central costs, we get a valuation for the company of R6,690 million, before the adjustments we discuss below.

Minority Interests

Thungela Resources will be created by effectively acquiring the shares of South Africa Coal Operations Proprietary Limited ('SACO'). Immediately prior to listing, Anglo American intends to distribute 10% of the SACO shares to SACO Employee Partnership Plan (5%) and to Nkulo Community Partnership Plan (5%) as part of its Black Economic Empowerment obligations. Shareholders in Thungela will therefore own 90% of SACO. (Technically the valuation approach is to value SACO using the CPR numbers and then attribute 90% of that to Thungela shareholders).

It appears that the SACO Employee Partnership Plan and the Nkulo Community Partnership Trust will own preference shares in addition to ordinary shares – ensuring a preferred dividend is paid to these entities in the first few years post-demerger. This will have a marginal impact on the valuation (R24 million for the Nkulo community partnership plan; the SACO employee partnership plan is specified on a per employee basis, but the total number of applicable employees is not specified – we estimate a total cost of R90 million[38]).

It should also be noted that there are Black Economic Empowerment minority interests elsewhere in the ownership structure as illustrated from the following chart from the listing prospectus:



Source: Thungela Prospectus p40

We think it likely that in the case of a shortage in funding for clean-up costs, Thungela will be the party that has to cover the shortfall – i.e. Thungela shareholders may be liable for 100% of the environmental costs while only being 90% owners. Should Thungela fail to fulfil its obligations, we believe that Anglo American could be open to a legal challenge should it be unwilling to provide further funding.

[38] Source: Page 77 of prospectus. Our estimate of ZAR 90M is based on 7,525 employees as of the end of 2020, of which 75% are eligible to ZAR 4,000 per year for the years 2021 – 2024 inclusive (7525 * 0.75 * 4000 * 4 = 90M)

Additional Environmental Liabilities
As we demonstrated in the previous section, we believe that Thungela has massively underestimated its long-term environmental liabilities. We expect the company will need to immediately increase liabilities when the new NEMA rules are introduced, which was originally due to happen just 12 days after listing. We anticipate that further costs will arise based on significant additional remediation work identified by SRK in the competent person's reports.

Some of the NEMA costs are incorporated in the DCF models from the CPRs but it is not always entirely clear what is and what is not included – hence we may have double counted some liabilities. Nevertheless, we believe that we are in the right ballpark.

Our estimate of total end-of-life environmental liabilities was R18,811 million. Deducting the R6,450 million already provisioned by Thungela, we get additional liabilities of R12,361 million.

Our liability estimates were derived from careful reading of the CPRs and aggregating the capex and operating costs (capitalised at the South African base rate) that are quantified in the reports. We have assumed that there will have to be a ring-fenced trust to cover these costs at some point before closure. We note that the CPRs have identified a number of potential costs that have not been quantified, so our overall estimate may end up being too low.

Cost of Capital
The SRK reports use a real weighted average cost of capital (WACC) of 10.7%. This is based on an assumption that each project is financed on the basis of a debt:equity ratio of 30:70. Inherent in the calculation is a post-tax cost of debt of 5.31%[39] which helps bring the overall weighted average cost of capital down.

We believe that banks and other financial institutions will treat the end-of-life environmental costs as a form of contingent liability or indebtedness, which will limit the ability of the company to add further debt. In view of this we believe that the assumption in the SRK reports of the company being able to add leverage at the corporate level may be optimistic. (Additionally, we note that many financial institutions are avoiding lending to coal mining companies and lending to companies with limited life assets is particularly unattractive.)

Adjusting the WACC calculation to assume no debt will move the WACC in nominal terms from 15.34% to 17.19% and the WACC in real terms from 10.7% to 12.55%. This has an impact on the valuation of the mines according to the CPR reports. The following table,

[39] For instance, see table 19-3 on page 334 of the Competent Person's Report for Khwezela by SRK

based on our calculations, at the mine level (i.e. prior to adjustments for economic ownership) suggest a 5% impact due to our WACC adjustment.

		WACC of 10.7%	WACC of 12.5%	Delta
Greenside	SRK	3,335	3,215	(-120)
Goedehoop	SRK	1,308	1,273	(-35)
Zibulo	SRK	5,866	5,536	(-331)
Isbonelo	SRK	459	436	(-24)
Khwezela	SRK	886	843	(-43)
Mafube	SRK	2,024	1,886	(-139)
Elders	Uwazi	872	No sensitivity given	
Dalyshope	SRK	No wacc dependent valuation		
Sum of deltas				(-691)

Source: Boatman Capital Calculations of the impact of adjustment to the WACC to assume no debt - all at asset level

(The CPR for the Elders development project was produced by Ukwazi and it estimates the NPV of the mine is R872 million[40,41] using a nominal weighted cost of capital of 13.3%[42]. This compares to nominal WACC of 15.34%[43] used by SRK for the other mines. We believe that it is irrational for a project such as Elders, which has not yet commenced commercial operations, to have a lower WACC than an established mine.)

Price of coal

The majority of the CPR reports use a Wood Mackenzie estimate for coal prices as per the following:

Table ES-17: Forecast Exchange Rate and API Export Price (Real terms)

Item	Units	2021	2022	2023	2024	2025	2026	2027	2028
Exchange Rate	(ZAR/USD)	16.24	15.58	14.99	13.75	13.75	13.75	13.75	13.75
API 4 Price	(USD/t)	85.2	82.4	80.7	79	79.3	79.4	79.5	81.1

Source: Wood Mackenzie (2021)

Source: API forecast from Goedehoop CPR Page xxxvi

The Elders and the Dalyshope Reports refer to forecasts by Afriforesight for RB1 (= API 4) for 2021 of \$65/t versus \$85.2/t in the Wood Mackenzie estimate above. Thungela therefore appears to be using two different prices for the same type of coal. We suspect that this is

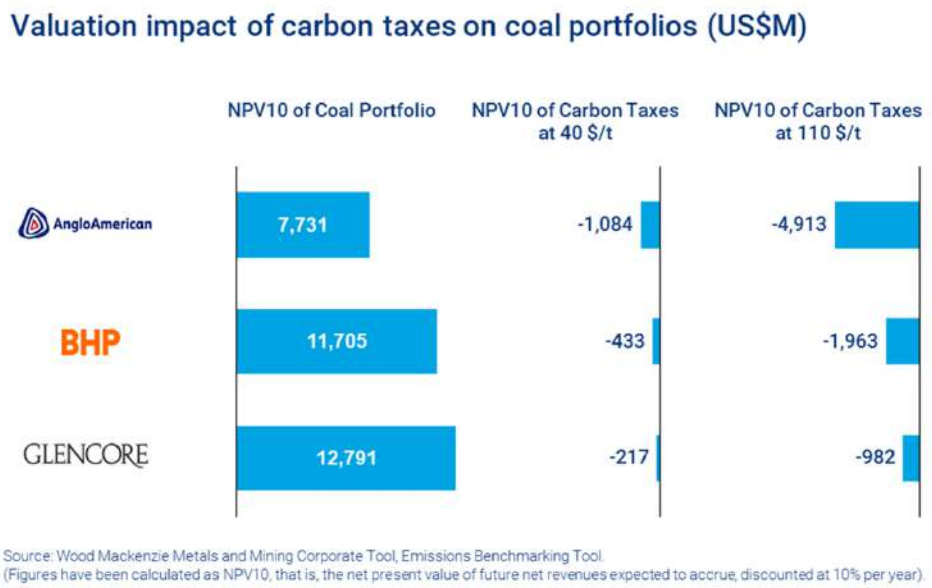
[40] See table 6-2 on page 111 of the Competent Person's Report for Elders
[41] Since Thungela's economic interest is 73% this would mean a value of 63% x 872 = ZAR 637M
[42] See table 6-2 on page 111 of the Competent Person's Report for Elders by Ukwazi
[43] See table 19-3 on page 334 of the Competent Person's Report for Khwezela by SPR as an example

because coal prices spiked in late 2020 so forecasts done around that time might have produced a higher range than a forecast done earlier in 2020.

We think that the Wood Mackenzie estimates used by the CPRs are over optimistic for the following reasons:

1. Carbon emissions taxes.

Wood Mackenzie recently published an article (16 March 2021) on their website which highlights the impact of carbon taxes on the Anglo-American coal portfolio.[44] Though the article does not give the breakdown between Anglo-American's thermal and metallurgical coal we believe it illustrates that a valuation of Thungela is susceptible to carbon taxes.



Source: Wood Mackenzie

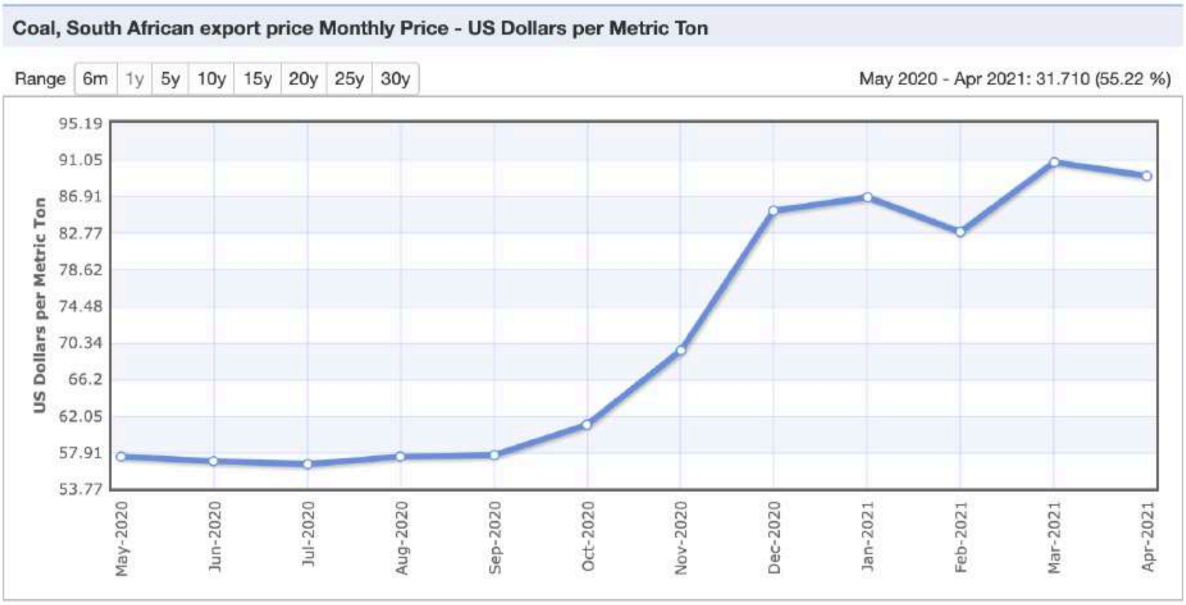
In a second article WoodMac stated[45]: "We believe a carbon price of US$110 per tonne will be required everywhere by 2030 to meet the two-degree demands of the Paris Agreement (against our current base of US$40 per tonne). Should that price be imposed, costs will see a significant jump for thermal and met coal."

2. Cold Snap vs Long-term Trend

A number of factors including a cold snap in December 2020 lead to higher power demand across Asia and a spike in coal prices (see chart below). Longer term, however, the shift in Japan and China to LNG and nuclear power is likely to increase the amount of Australian coal available for markets traditionally served by South Africa and hence drive prices down.

[44] https://www.woodmac.com/news/opinion/metals-and-mining-how-much-value-is-at-risk-from-carbon-policy/

[45] Wood Mackenzie report 29 April 2021



Source: IndexMundi[46]

We believe that prudent investors will model Thungela on a long-term price estimate which is lower than the price in the Wood Mackenzie forecast. We have used $68/tonne for API 4 / RB 1 coal because that is the lowest price used in valuation sensitivity tables by SRK in its competent persons report.

We have aggregated the impact of a long-term price of $68 per tonne on the valuations of the individual mines as provided in the CPRs. It will be seen that the overall impact is R7.4 billion.

		DCF at CPR estimate		Economic stake	Adjusted for economic interest	
		API at $80	API at $68		API $80	API $68
Underground						
	Greenside	3,335	1,748	100%	3,335	1,748
	Goedehoop	1,308	254	100%	1,308	254
	Zibulo	5,866	3,727	73%	4,282	2,721
Open-cast						
	Isibonelo			100%		
	Khwezela Proved Pr	886	(-1,144)	100%	886	(-1,144)
	Mafube	2,024	(-306)	50%	1,012	(-153)
	Rietvlei					
New projects						
	Elders			73%		
	Dalyshope					
Totals of items where available		13,419	4,279		10,823	3,426

[46] https://www.indexmundi.com/commodities/?commodity=coal-south-african&months=12

Adjustment for VAT
The current rate of VAT in South Africa is 15%. The rehabilitation costs summarised within the CPR reports are all before VAT. Generally, for an operating business this should not be an issue but for Thungela there is a high probability that the revenue generating assets will have a commercial life that is substantially less than the liabilities for rehabilitation of the mines. Hence, the company may not be able to offset VAT it pays off against VAT it charges its customers. We estimate that this impact could be R705 million[47].

Life of mine
We note that the CPR valuations include assumptions that there will be life extensions for a number of the Thungela mines. We have not adjusted for this, but we would question whether the prospects for thermal coal really justify this optimism.

Valuation Model

Putting it all together, we find the valuation of Thungela to be below zero.

We appreciate that any one adjustment is subject to debate but we prefer to be "roughly right rather than precisely wrong" so cannot reach a valuation other than zero.

DCF valuation as per CPR	10,083
Central costs	(-3,392)
SACO Employee Plan Preferred payout	(-90)
Nkiulo CPP Preferred payout	(-24)
Additional Environmental Liabilities	(-12,361)
Adjustments for cost of capital	(-691)
Adjustments for price of coal at $68 long term	(-7,397)
Adjustment for VAT	(-705)
Anglo American 'dowry'	2,500
Total	(-12,077)
Adjust for Thungela shareholders 90% ownership	(-10,870)

Our models, detailed analysis and consultations are available at request.

[47] Total rehabilitation costs of ZAR18,811m of which we estimate 25% are susceptible to VAT at 15% (18,621 x 25% * 15% = ZAR 705M)

Appendix I

Table 15-10: SRK Summary of Zibulo Liability

Item	Related Financial Closure Provision (ZARm)	
	As at Dec 2019	Adjusted to December 2020
DMRE Assessment:		
Unscheduled	202.1	210.2
NEMA Assessment:		
Planned (excluding VAT)	356.7	371
Unplanned (excluding VAT)	423.9	440.9
Provision to DMRE (2019 data):		
Guarantee	390.5	406.1
Trust	34.4	35.8
Total Provision	**424.9**	**441.9**
Surplus/difference between provision and DMRE assessment	222.8	231.7
Additional Liability arising from Risk Items:		
Water Treatment (Capex)	121.4	126.3
Water Treatment (Opex ZARm/annum)	6.4	6.7
Illegal/artisanal post closure activity	Cannot quantify	Cannot quantify

Source: Zibulo Colliery CPR, p. 281.

Table 15-7: SRK Summary of Mafube Liability

Item	Related Financial Closure Provision (ZARm)	
	As at December 2019	Adjusted to December 2020
DMRE Assessment		
Unscheduled	361	375.4
NEMA Assessment		
Planned (excluding VAT)	809.4	841.8
Unplanned (excluding VAT)	1013.8	1054.4
Provision to DMRE		
Guarantee	372.1	387
Trust	42.2	43.9
Total Provision	**414.3**	**430.9**
Surplus/difference between provision and DMRE assessment	53.3	55.4
Additional Liability arising from Risk Items		
Dump Covers (estimated total for coarse and fine residue deposit)	85	88
Water Treatment Opex	5.5 – 8.5	5.7 – 8.8
Water Treatment Capex (plant refurbishment and/or replacement)	50	52
Illegal/artisanal post closure activity	Cannot quantify	Cannot quantify

Source: Mafube Colliery CPR, p. 236.

Table 15-8: SRK Summary of Goedehoop Liability

Item	Related Financial Closure Provision (ZARm)	
	As at December 2019	Adjusted to December 2020
DMRE Assessment		
Unscheduled	586	610
NEMA Assessment*		
Unscheduled	606*	630
Scheduled	493	513
Provision to DMRE (2019 data)		
Balance in Trust	678	678
Bank Guarantees	174	174
Total Provision	**852**	**852**
Surplus/difference between provision and DMRE assessment	266	242
Additional Liability arising from Risk Items		
Illegal/artisanal post-closure activity	Unquantified	Unquantified
Water Treatment (Capex)	188 - 500	188 - 500
Subsidence	Unquantified	Unquantified
Dump covers	500 - 600	500 - 600
Impact of discard on aquifers	Unquantified	Unquantified
Bankfontein Dam remediation	Unquantified	Unquantified

Note:
* The NEMA Assessment does not include the ZAR30 million inaccuracy in the assessment.

Source: Goedehoop Colliery CPR p. 263

Table 15-8: SRK Summary of Greenside Liability

Item	Related Financial Closure Provision (ZARm)	
	As calculated at December 2019	Adjusted to June 2020
DMRE Assessment:		
Unscheduled	554.9	577.65
NEMA Assessment:		
Unscheduled	440.6	458.6
Scheduled	370.3	385.9
Provision to DMRE (2019 data)	598.3	Will not change until end 2020
Surplus/difference between provision and DMR assessment	*43.4*	
Additional Liability arising from Risk Items:		
Dump Covers	250 - 350	250 - 350
Water Treatment	20 - 70	20 - 70
Illegal/artisanal post closure activity	Cannot quantify	Cannot quantify
Clydesdale pan	Cannot quantify	Cannot quantify

Source: Greenside Colliery CPR, p. 217.

Isibonelo

Table 14-7: Financial Closure Provision

Item	Related Financial Closure Provision (ZARm)	
	As at Dec 2019	Adjusted to December 2020
DMRE Assessment:		
Unscheduled	248	257.9
NEMA Assessment:		
Planned (excluding VAT)	373	387.9
Unplanned (excluding VAT)	738	767.5
Provision to the DMRE:		
Guarantee	473	Not applicable to adjust
Trust	79	Not applicable to adjust
Total Provision	**552**	
Surplus/difference between provision and DMRE assessment	*304*	
Additional Liability arising from Risk Items:		
Theft/criminal activity related to post closure equipment	Cannot quantify	Cannot quantify
Water Treatment (Capex)	– 99.2	– 103.2
Water Treatment (OPEX ZAR/annum)	4.6	4.8

Source: Isibonelo Colliery CPR, p. 161.

Table 15-9: SRK Summary of Khwezela Liability(based on DMRE Estimate)

Item	Related Financial Closure Provision (ZARm)	
	As at December 2019	Adjusted to December 2020
DMRE Assessment		
Unscheduled	1 995	2 075
NEMA Assessment		
Planned (excluding VAT)	**2 762**	**2 868**
Kromdraai	881	916
Excelsior	49	51
Navigation	262	272
Umlalazi and Ingwenya	121	126
Blaauwkrans	100	104
Schoongezicht	76	80
Bokgoni	1 252	1 302
RLT	21	22
Unplanned (excluding VAT)	3 928	4 083
Provision to DMRE		
Guarantee	1 441	1 499
Trust	1 477	1 536
Total Provision for rehabilitation	2 918	3 035
Shortfall for immediate (unplanned) closure (unplanned liability less Trust Fund)	**2 189**	**2 275**
Post-closure decant water treatment (constant terms LoM total)		**2 616**
Estimate for Capex (2021)		115
Estimate for annual Opex:		
Years 2022 to 2025	(ZARm/year)	12
Years 2026 to 2027	(ZARm/year)	36.6
Years 2028 to 2033	(ZARm/year)	68.3
Years 2034 to 2059	(ZARm/year)	75.7
Additional Potential Liability arising from Risk Items		
Dump Covers		1 000 - 2 000
Shortage of closure covers		Not quantified
Subsidence		Not quantified
Closure of Yellow Boy dams		10 – 75
Water course rehabilitation		Not quantified

Source: Khwezela Colliery CPR, p. 306.