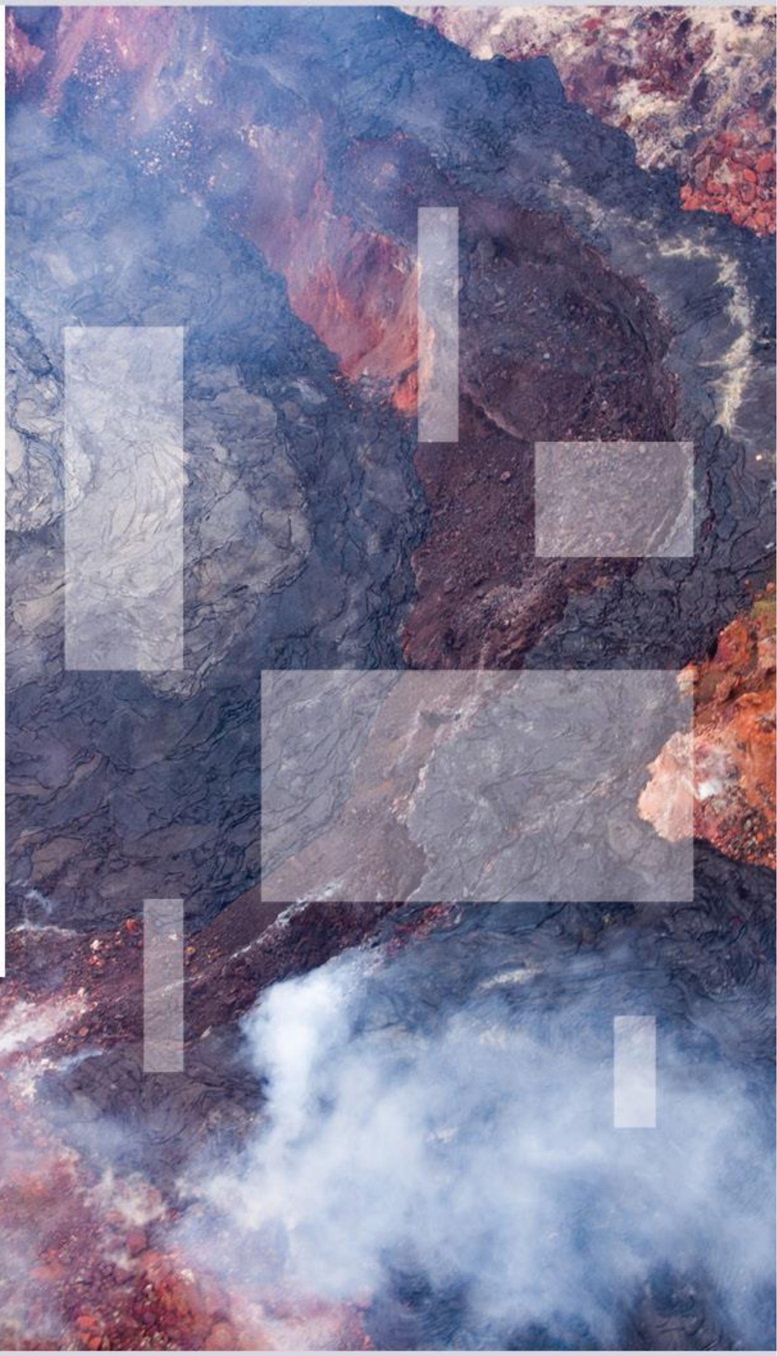
South32 Superannuation Plan

Report on the Actuarial Investigation as at 31 December 2021

24 June 2022

STATEMENT OF ADVICE

Towers Watson Australia Pty Ltd
45 002 415 349 AFSL 229921



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Section 1: Introduction and Purpose

Purpose of Investigation

This report sets out the results of the actuarial investigation of the South32 Superannuation Plan ("the Plan") as at 31 December 2021 requested by the Trustee. The Plan is a sub-plan within the Plum division of the MLC Super Fund, a master trust arrangement.

Under APRA's Prudential Standard SPS 160 Defined Benefit Matters, funds which provide defined benefit pensions are required to complete actuarial investigations annually unless APRA approves an alternative frequency (usually triennial). We understand that APRA has approved triennial investigations for the Plan and as a result this investigation is prepared effective 31 December 2021.

The Plan's Participation Agreement, which governs its participation in the MLC Super Fund, requires the Trustee to request that the actuary undertakes an actuarial investigation of the Plan at least every three years, or more frequently if required by Superannuation Law, and to issue a written report. The Participation Agreement also provides that where the report by the Actuary discloses that the value of the assets attributable to the Plan is more or less than sufficient to provide the benefits the Trustee, after obtaining the advice of the Actuary and subject to consent of the Principal Employer, may change the contributions payable by employers.

The actuary is required to report on the results of the investigation within such periods and in such manner as required by Superannuation Law having regard to the state and sufficiency of the Plan with respect to the present and future liabilities and to make any recommendations as the actuary sees fit. The report of the actuary is provided to the Trustee who in turn is required to provide a copy to the Employer.

The purpose of this actuarial investigation is to meet the requirements of the Trust Deed and the relevant superannuation legislation, in particular:

- to examine the current financial position of the Plan (Section 6);
- examine the long-term funding of the Plan (Section 7);
- examine the financial position of the Plan during the ensuing three years (Section 7);
- recommend a rate at which the Employer should contribute to the Plan (Section 7);
- provide the certification required under Prudential Standard SPS 160 that there is a high probability that the Plan will be able to pay defined benefit pensions in accordance with the Trust Deed, as at 31 December 2021 (Section 8); and
- meet the reporting requirements of Prudential Standard SPS 160 "Defined Benefit Matters" ("SPS 160") (Appendix C).

This actuarial investigation has been carried out in accordance with Practice Guideline 1, Professional Standards 400, 402, 404, 410 and Guidance Note 465.

I confirm that I have not been subject to any restrictions or limitations in the preparation of this report.

Structure of the Plan

The Plan is a “regulated” fund under the Superannuation Industry (Supervision) Act and therefore qualifies for concessional tax treatment.

The Plan was established, within the Plum Superannuation Fund (PSF) Master Trust, from 1 November 2015 and with membership initially transferred from the BHP Billiton Superannuation Fund No.1. A Participation Schedule dated 29 October 2015 set out the benefits and provisions of the Plan within the PSF Master Trust.

The Plan’s assets, members and benefit liabilities were then successor fund transferred into an employer sponsored plan within the Plum division of the MLC Super Fund, also a master trust arrangement, on 1 July 2016. Equivalent benefits are provided in the MLC arrangement as there were no changes to the benefit provisions or entitlements. The Trustee of the MLC Super Fund is NULIS Nominees (Australia) Ltd, a company licensed by APRA to operate as a superannuation fund trustee.

On 1 November 2016 the members and assets of the Worsley Alumina Superannuation Fund (“WASF”) were transferred into the Plan. Although not a successor fund transfer, we were advised that equivalent benefits are provided in the Plan for the transferred WASF members. In particular the benefit provisions relating to transferred WASF defined benefits were largely replicated in the Plan. The Participation Agreement was updated following the transfer to appropriately reflect the additional membership and benefit provisions.

Similarly, on 1 November 2018 the members and assets of the TEMCO Superannuation Plan (“TEMCO”), a sub-fund of the OnePath Master Fund, were transferred into the Plan. This transfer was made on a successor fund basis, with equivalent benefits provided in the Plan for the transferred TEMCO members. The Participation Agreement was updated following the transfer to appropriately reflect the additional membership and benefit provisions.

The current Participation Agreement, dated 22 November 2018, reflects all of the above and continues to apply.

On 1 July 2021 the members and assets of the TEMCO section in the Plan were transferred out following the divestment of this business by South32.

South32 Limited (”South32”) is the Principal Employer of the Plan (as defined in the Participation Schedule). There are a number of Associated Employers, as listed in the Participation Agreement.

The Plan includes three categories of Membership which may be summarised as follows:

- Division B, Part 1: A category providing benefits largely defined in terms of the membership period and final average salary of members. This division contains the previous members of the BHP Billiton No 1 Superannuation Fund who were entitled to defined benefits in that fund. These members transferred into the Plan on 1 November 2015. This group of members are referred to as being in the “South32 DB” category for the purposes of this report. This category is closed to new entrants.

- Division B, Part 2: An Accumulation category providing benefits to employee members that are defined predominantly in terms of the accumulation of contributions with interest. This category represents the biggest portion of the membership and new members may only join the accumulation category. (Referred to in this report as the “Accumulation” category.)

- Division C: A category providing benefits largely defined in terms of the membership period and final average salary of members. This category’s members were previously members of the WASF who were entitled to defined benefits in that fund. (Referred to in this report as the “WASF” DB category). This category is closed to new entrants.

In addition, the Plan provides lifetime pensions to former employees who were members of the South32 DB category and who have elected to receive some or all of their retirement benefit as a pension. For funding purposes, the liabilities of the pensioners are included with the liabilities of the South32 DB category, from which they arose.

The assets of the Plan are also split into various components, including the:

- Accumulation Assets: Assets and reserves supporting the accumulation balances, being the balance of the accumulation accounts for accumulation employee members and the additional voluntary contribution accounts of South32 DB members and WASF DB members. The Plan does not have retained members, spouse members or allocated pensioners; and

- Defined Benefit Assets (“DB Assets”): The assets supporting the defined benefit liabilities of the South32 DB category, the WASF DB category and lifetime pensioners.

We note that the MLC Super Fund holds administration and Operational Risk Financial Requirement reserves in respect of all the sub-plans, so these are not required to be held at a sub-plan level.

The Plan provides benefits in respect of both defined benefit and accumulation liabilities. The purpose of this investigation is to investigate the financial condition of the Plan with respect to defined benefit liabilities only, and unless otherwise specified, this report relates only to such defined benefit liabilities. The accumulation liabilities of the Plan, including those related to defined benefit members, are fully funded and do not impact upon the defined benefit liabilities. No investigation is required regarding the pure accumulation liabilities, although in my recommendations I have continued to recommend that the Employer continue to meet any Superannuation Guarantee, contractual or any other obligations in respect of such liabilities where applicable. A detailed description of the defined benefits valued in this investigation is included in Appendix A to this report.

Assets relating to the Defined Benefit section (DB Assets)

For the purpose of assessing the financial condition in respect of the defined benefit liabilities only, the DB Assets are used.

Although the Plan’s combined DB liabilities are funded by the combined pool of DB Assets, the employer accounts for the benefit liabilities in their financial statements as if the South32 DB and WASF DB liabilities were funded separately, including determining a split of the Plan’s DB assets as if the WASF DB assets continued to be held separately.

Furthermore, the investment strategy adopted for the South32 DB category assets and the WASF DB category assets is different (as explained in Section 3). Consistent with this, the employer has historically preferred that different contribution rates be determined for the two different DB benefit categories, we have continued to take this into account in providing our recommendations. We note that the Trustee is able to accommodate the employer's funding preferences so long as they are also appropriate for the overall funding of the DB liabilities, which is the Trustee's primary concern.

At the time of this investigation, there are separate reserves held in respect of:

- The South32 DB and Lifetime Pension category, being:
  - South32 DB Reserve (STH32_DB #296);
  - South32 Pension Reserve (STH32_LP #297); and
- The WASF DB category, being:
  - WASF DB Reserve (STH32_DB #313).

The reserve information provided by the administrator was used in this report to allow us to determine assessments of the financial condition and funding recommendations for the South32 DB category (which includes lifetime pensioners) and the WASF DB category separately. We have also considered the financial condition for the Plan's combined DB liabilities.

While a notional split of the assets is provided by the administrator, the Plan does not contain separate sub-plans. This means that when considering the financial condition and funding in accordance with legislation the total defined benefit assets and liabilities must be considered.

Previous Actuarial Investigations

The previous actuarial investigation of the Plan was as at 31 December 2018 ("the 2018 Report"), and the results were presented in a report dated 27 June 2019 by Kate Maartensz, FIAA.

The 2018 Report reflected the employer preference that contribution rates for the South32 DB and WASF DB categories be determined separately and recommended that:

- The employer contribution rate in respect of the South32 DB category members be at least 31.6% of superannuation salaries for DB members of the South32; and
- The employer contribution rate in respect of WASF DB category members be nil.

In addition it was recommended that salary sacrifice member contributions for DB members, OTE top-up contributions for WASF DB members and contributions in respect of Accumulation members continue to be paid.

Recommendations were also made in relation to a range of other issues, including a review of how Minimum Requisite Benefits (MRBs) are administered.

Subsequent to the completion of the 2018 Report, further letters of actuarial advice were provided by Kate Maartensz to the Trustee dated 14 April 2020 and 4 May 2020 in response to requests from the Employer. The letters commented on South32's proposal to the Trustee regarding the possibility of a contribution holiday given the strong financial position of the overall Plan. After considering advice from the Actuary, the Trustee approved South32's request for the contribution holiday. The revised contribution program from 31 March 2020 has been as follows:

- Defined Benefit Members of Part 1 Division B (TEMCO and GEMCO employees only): 31.6% of defined benefit members' salaries;
- Defined Benefit Members of Part 1 Division B (South32 DB members excluding TEMCO and GEMCO employees): nil until 30 June 2022 and then recommencement of contributions at 30% of defined benefit members' salaries or such other rate as advised by the Actuary;
- Defined Benefit Members of Division C (ex-WASF DB members): nil;
- Accumulation Members: at the rate of employer contribution required under trust deed provisions or other relevant agreements; and
- All Members: the amount of any salary sacrifice contributions.

We note that the contribution holiday for the South32 DB members (excluding TEMCO and GEMCO employees) has been notionally funded by annual transfers of $1 million from the WASF DB Reserve to the South32 DB Reserve as agreed between South32 and the Trustee, after having regard to the actuarial advice.

The recommendation from the 2018 Report in relation to the administration of MRBs still appears to be in the process of being fully implemented.

Key events since 31 December 2021

The following changes post 31 December 2021 have been noted for this report:

i. The investment return on the Plan assets supporting South32 DB since 31 December 2021 has been roughly -4.7% to 14 June 2022 (equivalent to -10.0% p.a.).

ii. The investment return on the Plan assets supporting WASF DB since 31 December 2021 has been roughly -5.6% for the three months to 14 June 2022 (equivalent to -11.9% p.a.).

An allowance has been made for these returns to 14 June 2022 when projecting the financial position of the Plan in Section 7 and in the recommendations made.

I am not aware of any other events subsequent to the investigation date which would have a material impact on the conclusions or recommendations in this report.

Section 2: Membership

We were provided with individual membership data as at 31 December 2021 for the following groups of defined benefit members from the Plan's administrator. The data included, where relevant, previous plan information:

- Active members of the South32 Division B, Part 1 (South32 DB members);
- Active members of the South32 Division C (WASF DB members); and
- Lifetime Pensioners.

We have performed checks on the data provided for the defined benefit members above. We are satisfied that the data provided is reasonable for the purposes of this actuarial investigation.

In addition, the administrator of the Plan has provided the aggregate account balances for the accumulation members and the voluntary accounts of the above DB members.

We have done reasonableness checks on the membership data to ensure that all dates, salaries and other amounts were reasonable. Overall, we are satisfied that the data provided is sufficiently accurate for the purposes of this investigation. Although we have no reason to doubt the quality of the data, the results of this investigation are nonetheless dependent on the quality of the data provided.

Defined Benefit Membership Summary and Statistics

Key membership statistics of the active defined benefit members in the Plan as at 31 December 2021 are shown below, split by the membership categories:

	South32 DB	WASF DB	Total
Number of Members	15	17	**32**
Average Age	56.6	58.2	**57.4**
Average Past Membership*	30.9	32.5	**31.8**
Average Salary ($)	172,200	120,800	**144,900**

* Including membership of the previous fund.

Since the previous actuarial investigation of the Plan as at 31 December 2018:

- the number of active defined benefit members in the South32 DB category has decreased from 21 as at 31 December 2018 to 15 as at 31 December 2021;
- the number of active defined benefit members in the WASF DB category has decreased from 22 as at 31 December 2018 to 17 as at 31 December 2021.

There were also seven lifetime pensioners in the Plan at 31 December 2021, with pensions totalling $507,000 p.a., and an average age of 63.7 years. At the previous investigation at 31 December 2018, there were six lifetime pensioners with pensions totalling $445,100 p.a..

Accumulation Membership

At 31 December 2021 the aggregate account balances of the Plan's accumulation members (including the additional voluntary accounts of the DB members) totalled $527.3 million.

As previously noted, the results presented in this report do not include the assets or liabilities relating to the Plan's accumulation members (including additional voluntary accounts of the DB members) and are only in respect of the defined benefit liabilities and assets of the Plan.

Section 3: Assets and Investments

Financial data

The administrator has provided us with the balance of the Plan's DB Assets (as comprised of the various reserves) at 31 December 2021. These amounts are used to meet the DB liabilities arising from the South32 DB category and the WASF DB category.

Net Market Value of DB assets for the purposes of this actuarial investigation

The Net Asset value represents the value of assets including any Transaction Costs that would be incurred on sale. We note that Professional Standard 404 requires that the "Fair Value" of assets be used which is defined as the value of assets before the deduction of Transaction Costs. Based on the type of assets held by the Plan we confirm that the Transaction Costs are not expected to be material. We have therefore used the Net Asset value provided by the Plan's administrator for the purposes of this investigation.

No financial statements are prepared for the Plan as a stand-alone entity as at 31 December 2021, however we have been advised that the asset values provided to us by the administrator have been calculated on a consistent basis with the preparation of the MLC Super Fund's audited financial statements as a whole.

After adjustments for benefits payable and contributions tax payable, the net market value of DB assets available to meet DB benefit liabilities at 31 December 2021 was determined to be $39.3 million as set out below:

	South32 DB	WASF DB	Total
Active DB reserve	18,044,955	16,290,691	34,335,646
Lifetime Pension reserve	5,599,227	-	5,599,227
Total reserves	**23,644,182**	**16,290,691**	**39,934,873**
Adjustments			
Benefits payable	-	(653,183)	(653,183)
Provision for Contributions tax payable	80	2,235	2,315
Total adjusted Assets*	**23,644,262**	**15,639,743**	**39,284,005**

* Totals may not equal the sum of the individual figures as a result of rounding.

We have used a combined net asset value of $39,284,005 for the purpose of assessing the financial position of the defined benefits. The separate South32 DB category and WASF DB category assets shown above have been used for recommendations regarding appropriate rates of funding and employer contribution for each category.

For the purpose of assessing the financial position of the Plan, we are required to exclude any Operational Risk Financial Requirement ("ORFR") reserve from the net assets. However, the ORFR reserve is not required to be held at a sub-plan level, therefore no further adjustment to the asset values shown above is necessary.

We are satisfied that there are no material data discrepancies and that the net asset data provided is suitable for the purpose of this investigation. We have relied on the information provided by the administrator for the purposes of this investigation. Although we have no reason to doubt the quality of the asset information provided, the results of this investigation are dependent on the quality of the asset information. Any changes to the asset values above will have an impact on the outcome of the investigation and any resulting recommendations.

Crediting Rate Policy

The crediting rate policy relates to the crediting of investment earnings to accumulation accounts for both DB members and Accumulation members, based on the actual investment returns of the underlying assets (except for the rate applying to family law offset accounts which is consistent with legislation). A crediting rate is also determined for the purpose of allocating investment earnings to the surcharge accounts and South32 DB members' Member Accumulated Contributions (MACs), as well as for calculating late payment interest for DB members' benefits. Late payment interest is subject to a minimum of zero.

The crediting rate policies in brief are:

- For Accumulation balances: to use the daily unit prices to credit investment earnings to members' accumulation accounts.
- For South32 DB members' MAC Accounts: crediting rates are set monthly in arrears as determined by the Actuary and based on the "money weighted" investment return of the South32 DB category assets, after fees and taxes.

  An interim earning rate is used for members' benefits or benefit quotes for the period from the last declared crediting rate to the date of exit or date of the quote. The interim rate is based on the 90 day Bank Bill rate on the last working day of the prior period, adjusted for 15% tax.
- For DB members' surcharge accounts and late payment interest: these accounts are accumulated using the 30 day bank bill rates (on the first working day of the month) adjusted for 15% tax.

We consider that the crediting rate policy currently adopted by the Trustee is appropriate.

Investment Strategy

The Trustee has set clearly articulated, measurable (in relation to both risk and return) and formally documented investment objectives for each of the Plan's investment options available to members (for the investment of accumulation balances) and available for the investment of the Plan's DB Assets. Investment strategies, incorporating a broad range of issues, are adopted to achieve the stated investment objectives.

Under the Trustee's Investment Governance Policy, the Risk and Audit Committee (on behalf of the Trustee), approves and monitors the suitability of the investment strategy for defined benefit assets, and changes to it, in consultation with the relevant Actuary.

In line with the current investment strategy adopted by the Trustee, the DB assets are to be invested in the following unit trusts in the stated proportions:

- South32 DB Reserve and pension Reserve: 50% allocation to MLC Cautious and 50% allocation to MLC Conservative
- WASF DB Reserve: 67% allocation to MLC Conservative and 33% allocation to MLC Fixed Interest.

There have been no changes made to the above investment strategy since the 2018 report.

As at 31 December 2021, and based on the strategic asset allocations of the individual unit trusts specified in the strategy, the DB Assets were invested with the following long term strategic asset allocations:

Investment Sector	South32 DB and Pension (%)	WASF DB (%)
Australian Shares	14.0%	6.7%
Global Shares Unhedged	11.5%	5.3%
Global Shares Hedged	3.5%	2.0%
Listed Property	7.0%	4.7%
Private Equity	2.5%	0.7%
Infrastructure	5.5%	3.3%
Growth Alternatives	3.0%	2.0%
Total "Growth" Assets	**47.0%**	**24.7%**
Fixed Income	34.0%	61.3%
Cash	11.0%	8.7%
Defensive Alternatives	8.0%	5.3%
Total "Defensive" Assets	**53.0%**	**75.3%**
Total	**100.0%**	**100.0%**

The overall strategic growth asset allocation for South32 and WASF DB assets has increased slightly since the 2018 report (where the growth allocations were 40% and 20% respectively). This change is as a result of changes in the strategic asset allocation of the underlying unit trusts in which the DB assets are invested.

We are satisfied that the investment objectives and strategy currently adopted by the Trustee for the DB Assets held in respect of the defined benefit liabilities are within the range of strategies considered reasonable for a plan of the size and with the benefit design of the Plan, having regard to the risk objectives.

As at 31 December 2021, the actual proportion of South32 and WASF DB assets invested in each of the respective unit trusts was as follows:

	South32 DB		WASF DB	
MLC Conservative	$11,268,572	48%	$11,205,155	69%
MLC Cautious	$12,375,611	52%	-	-
MLC Fixed Interest	-	-	$5,085,536	31%
Total	**$23,644,182**	**100%**	**$16,290,691**	**100%**

* Totals may not equal the sum of the individual figures as a result of rounding.
Note: the results in the table above do not include adjustments for contributions tax or benefits payable.

As can be seen, as at 31 December 2021 the proportions in each unit trust are broadly in line with that outlined in the strategy. The Trustee should monitor any change in proportions as a result of market movement and rebalance the DB assets to be in line with the strategy if and when necessary.

Section 4: Financial and Demographic Experience

Professional Standard 400 requires that the financial and demographic experience of the Plan is reviewed every three years.

Summary of Financial Experience

A summary of the financial experience of the Plan over the period since 1 January 2019 to 31 December 2021, or longer period as noted, is provided below. Where appropriate, particular emphasis is placed on the comparison of expected and actual experience since the last investigation as at 31 December 2018.

Investment Returns

The table below sets out the investment returns of the DB Assets over the three year period to 31 December 2021:

Investment Returns	South32 DB Assets	WASF DB Assets
1 January 2019 to 31 December 2019	7.9%	5.7%
1 January 2020 to 31 December 2020	1.9%	1.8%
1 January 2021 to 31 December 2021	8.3%	3.3%
Annualised Return (p.a.)	**6.0%**	**3.6%**
Assumed return in 2018 report (p.a.)	**3.4%**	**2.5%**

The overall return for both categories has been higher than the respective long-term return assumed in the last actuarial investigation. This experience alone would have had a positive impact on the Plan's financial position compared to that expected.

Salary Increases

The 2018 report assumed salary inflation of 2.5% p.a.. Compared to this assumption:

- The average salary inflation for South32 DB members since the previous investigation has been 2.0% p.a.; and
- The average salary inflation for WASF DB members since the previous investigation has been 1.4% p.a..

When considered in isolation, the lower than assumed salary experience would have had a positive impact on the Plan's financial position.

Real Returns

The ‘real’ return is the excess of the rate of investment return over the rate of salary increases. Comparing the actual rate of real returns to that assumed over the investigation period allows us to identify the impact of financial experience during this time.

The table below sets out the annualised real returns in respect of South32 DB members and the WASF DB members for the period from 1 January 2019 to 31 December 2021. The real return assumption adopted for the previous actuarial investigation as at 31 December 2018 is also shown for comparison.

Real Returns p.a.	South32 DB	WASF DB
Actual Investment Return	6.00%	3.60%
Actual Salary Inflation	2.00%	1.40%
Actual Real Return	**4.00%**	**2.20%**
Assumed Investment Return	3.40%	2.50%
Assumed Salary Inflation	2.50%	2.50%
Assumed Real Return	**0.90%**	**0.00%**

The above table shows that the real return experience, compared to the assumed experience, has been favourable in respect of both the South32 category members and the WASF DB category members. In total, the combined experience above would have had a positive impact on the Plan overall.

Demographic Experience

For the purpose of valuing the liabilities of the Plan it is necessary to make assumptions in respect of the rate at which members exit the Plan.

Exits out of the Plan

We have been advised that there were no defined benefit member deaths or total and permanent disablements during the investigation period.

The table below sets out the actual number of active members who voluntarily exited the Plan in the period since 1 January 2019 compared to the expected number of exits based on the demographic assumptions adopted in the 2018 report:

	Actual experience	Expected experience	Actual Versus Expected
Number of Retirements and Withdrawals	11	21	53%

The table above shows that overall there were fewer exits than expected over the investigation period.

The table below sets out the actual number of active members who exited the Plan from 1 November 2015 to 31 December 2018 compared to the expected number of exits:

	Actual experience	Expected experience	Actual Versus Expected
Number of Retirements and Withdrawals	34	32	106%

Since 1 November 2015 the actual exit experience of active members has been approximately 85% of expected. The financial position of the Plan is not particularly sensitive to exit experience, so this experience would not have had a large impact on the Plan's financial position.

Pension take-up experience

The 2018 report assumed 25% of all eligible members would elect to take 85% of their retirement benefit as a lifetime pension.

The table below sets out the actual number of active members electing to take a lifetime pension on retirement over the period from 1 January 2019 to 31 December 2021:

Exits out of the plan	Number of Exits*	Total Benefit Amount
Active exits eligible to take a pension	7	$4,986,585
Total pension purchased	2	$1,625,593
Actual pension take up	**29%**	**33%**

* Only South32 DB members above early retirement age are eligible to elect a pension on retirement.

Members eligible to take a pension can also choose to take a proportion of their benefit as a lifetime pension with the remaining benefit taken as a lump sum. Over the three years to 31 December 2021, the two members who opted for a pension elected to take 100% of their total retirement benefit as a lifetime pension.

The lump sum benefit for the 7 exited members entitled to elect a pension totalled $5.0 million. Of this $3.4 million was taken as a lump sum payment and the remaining $1.6 million forgone in favour of a lifetime pension (i.e. a pension take-up proportion of 33% on the basis of benefit payments).

This experience compares to an expected pension take-up proportion of 21.3% (i.e. it was assumed that 25% of all eligible members would elect to take 85% of their retirement benefit as a lifetime pension).

In the 2018 investigation, the experience from 1 November 2015 to 31 December 2018 suggested a pension take-up proportion of 38%. Combining this experience from the prior investigation results in an actual pension take-up proportion from 1 November 2015 to 31 December 2021 of around 36%.

The results show that the proportion of benefits being taken as a lifetime pension has been higher than anticipated over the past six years. This has had a negative effect on the Plan as the cost of the pension benefit is currently greater than the cost of the lump sum benefit forgone. On its own, this would weaken the funding position of the South32 DB category (and thus the overall financial position of the Plan).

TEMCO Transfer Out

The members, benefit liabilities and assets of the former TEMCO Superannuation Plan transferred out of the Plan on 1 July 2021. On the transfer date, the assets belonging to the ex-TEMCO members were more than the vested benefits for the transferring members. The transfer is therefore expected to have a broadly negative impact on the financial position of the Plan, however we note that this section of the Plan was relatively small.

Section 5: Valuation Method and Actuarial Assumptions

Funding Objectives

The Superannuation Industry (Supervision) Act 1993 (SIS) and associated Regulations contain a number of funding and solvency requirements.

SIS solvency standards consider the funding of Minimum Requisite Benefits, as well as the funding of vested benefits. A failure to cover Minimum Requisite Benefits with the net realisable value of assets results in "technical insolvency" and a requirement for a rigorous five year plan to restore solvency.

In addition, Superannuation Prudential Standard (SPS 160), focuses strongly on having superannuation funds aim to have assets in excess of vested benefits. This implies having a vested benefit index for defined benefits (DB VBI) that is in excess of 100%, with a target between 105% and 110% often adopted. The DB VBI is the ratio of the net defined benefit asset value to the corresponding total of defined benefit vested benefits of members.

The Trustee monitors the Plan's VBI on a quarterly basis (for the Plan overall as well as for the South32 DB category and WASF DB category separately). While the Trustee does not adopt an explicit target VBI, it endorses the legislative view that there is a preference to see defined benefit funds managed to a stronger financial position with a suitable buffer above a 100% VBI.

Valuation Method

The funding method adopted at the previous investigation of the Plan was the Projected Benefit Funding Method. We have again used this valuation method in this investigation to project the financial position of the Plan.

This method involves:

- Projecting the Plan's expected future cash flows in respect of the defined benefit members including expected contributions made by the employer and employees, and benefit payments expected to be paid to terminating employees. Tax and administration expense assumptions are also included;
- Using the expected cash flows, projecting the total value of assets backing DB liabilities held by the Plan over the future lifetime of the Plan;
- Projecting the Plan's vested benefits, in respect of the DB members, over the future lifetime of the Plan; and
- Comparing the value of the vested benefits with the value of the assets to assess the Plan's ability to pay benefits at any particular point in time in future.

In my opinion, as the Plan is closed to new defined benefit members and with consideration given to the regulatory requirements and focus on VBI levels, this methodology remains appropriate for this investigation.

Assumptions Used as at 31 December 2021

This section sets out the assumptions used in the determination of the financial position and contribution recommendations as at 31 December 2021.

Investment Returns

The investment return assumption for DB Assets has been determined after considering information from the Willis Towers Watson investment model. The assumption reflects the Plan's expected cashflows and the asset allocation of the Plan's assets for each DB benefit category. The investment return assumptions for active members are net of investment expenses and tax. The assumption in respect of lifetime pensioners is net of investment expenses but has not been reduced for investment tax, reflecting that the Plan applies for tax deduction for assets backing lifetime pensions.

The assumed investment return rates are set out below:

	Expected return on assets (p.a.)
South32 DB category:	
- Active members	3.90%
- Pensioners	4.50%
WASF DB category:	
- Active members	2.10%

The assumed investment returns for the South32 DB category are higher than those assumed at the prior 31 December 2018 investigation (active members: 3.40% p.a., pensioners: 4.0% p.a.), primarily due to changes in market conditions since the previous investigation.

The assumed investment return for the WASF DB category is slightly lower than assumed previously (2.5% p.a.), again due to changes in market conditions since the previous investigation.

Salary Increases

From our discussions with the Employer and taking into account the long-term expectations for wage inflation and expectations for Plan members based on their type of employment, we consider an assumed salary inflation rate of 2.5% p.a. to be appropriate for this actuarial investigation of the Plan. The salary assumption used for the last actuarial investigation was also 2.5% p.a..

Real Rate of Return

As discussed earlier, the assumption of major significance in the investigation of the Plan's future DB liabilities is the difference (or "gap") between the assumed future rate of investment earnings and the assume rate of future salary growth (or pension indexation for pension liabilities). These factors are offset against each other in their financial effect – hence the difference between them is more important than the absolute values ascribed to them.

	Expected return on assets (p.a.)	Expected Salary Inflation or Pension Indexation (p.a.)	Assumed "Gap" – current investigation	Assumed "Gap" – previous investigation
South32 DB category:				
- Active members	3.9%	2.5%	1.4%	0.9%
- Pensioners	4.5%	0.0%	4.5%	4.0%
WASF DB category:				
- Active members	2.1%	2.5%	-0.4%	0.0%

The increase in the assumed earning rate for the South32 DB category means that the "gap" assumed for the valuation of that category's liabilities has increased. This is expected to reduce the actuarial value placed on those DB liabilities, and improve the long-term funding of that category, as more of the funding is expected to arise from investment earnings.

In contrast, the assumed earning rate, and hence the gap, for the WASF DB category has reduced. This is expected to increase the actuarial present value placed on those DB liabilities.

Overall, it is expected that the changes will slightly improve the Plan's long term funding. However the changes will have a smaller impact on the short term funding position as the majority of members' vested benefits are not affected by assumptions.

Expenses

Annual administration, actuarial, audit and other expenses have been allowed for at the rate of 0.25% p.a. of assets, on the basis of actual expenses over the last three years and the current administration fee structure. This assumption has reduced from that used in the last triennial actuarial investigation of 0.40% p.a. of assets.

We have also made an allowance for administering future lifetime pensioners by grossing up the value of the current lifetime pension liability by 1%. This has decreased from the previous assumption of 5% of pension liability primarily due to the increase in the value of the pension liability (fixed costs spread over higher figure) and due to lower expected expenses overall.

This cost has been reflected in both the contribution rate determined for active members as well as the value of the pension liability for current pensioners.

Insurance

The cost of insurance has been allowed for at the rate of 0.90% of DB members' Superannuation Salaries in accordance with the premiums set out in the insurance policy. This is in line with the assumption in the previous triennial investigation report.

Taxation

Any change in the taxation regime applying to superannuation funds in Australia will have an impact on the financial status of the Plan. We have assumed that the current regime will continue and that the tax rate presently applying to the Plan will be maintained in future (i.e. that the Plan will remain a complying superannuation fund for taxation purposes). Thus we have assumed a concessional tax rate of 15% will apply to net deductible contributions and investment earnings.

Member Contributions

South32 DB members currently contribute at the rate of 4% of salary and the total member contributions are currently capped at $2,400 p.a. (the contribution for a DB member with a salary of $60,000 or more). The level of the contribution cap has not changed since Plan commencement. For the purpose of this investigation, as with the previous investigation, it has been assumed that the maximum member contribution will not be varied. Over time, as salaries increase, this means that the proportion of the cost of funding benefits which is met by the Employer will increase.

Demographic assumptions

We have reviewed the demographic assumptions for the membership used for the previous investigation and, apart from the assumption relating to pension take-up and pension mortality (discussed below), we have retained the demographic assumptions used from the actuarial investigation of the Plan as at 31 December 2018.

Recent experience has been broadly in line with expected and given the small membership size means it is difficult to make assumptions, the prior assumptions are considered reasonable. The experience of the Plan will be monitored via the quarterly financial position updates so that any material deviation in experience will be identified.

Pensioner mortality

We have updated the assumed lifetime pension mortality to be consistent with the Australian Life Table 2015-17, being the most recent mortality tables for the Australian population. We have also allowed for mortality improvements of 1% p.a. from 1 July 2016. The previous investigation referenced the Australian Life Table 2010-2012 (with 1% improvement from 1 July 2011).

Proportion of benefits taken as a Lifetime Pension

We have assumed that 33% of eligible members will elect to receive their benefits in the form of a lifetime pension on retirement. This is an increase compared to the previous investigation where we assumed 25% of all eligible members will elect to receive 85% of their benefits in the form of a lifetime pension. The overall effect of the change will be to increase the value of the Plan's liabilities in respect of South32 DB category members.

The higher pension take-up assumption is in line with recent experience, however with only a small number of members taking pensions the experience is likely to be volatile.

As noted above, the experience of the Plan is regularly monitored and any adverse experience in relation to pension take up will be identified. We also consider the sensitivity of the contribution recommendations to this assumption.

The assumptions used in this investigation are summarised in Appendix B.

Section 6: Financial position as at 31 December 2021

In calculating the funding indices below, we have provided indices for the South32 DB category and WASF DB category separately, as well as for the combined DB membership.

We note that the liability and asset values at 31 December 2018 include the assets and liabilities of the ex-TEMCO members, whereas they are not included in the assets and liabilities as at 31 December 2021 (due to being transferred out of the Plan at 1 July 2021).

Vested Benefits

The Vested Benefits represent the benefit entitlements of members should they voluntarily leave the Plan. The Vested Benefits Index (VBI) is a test of the Plan's solvency if all members voluntarily resigned or retired (if eligible) on the investigation date.

In the case of lifetime pensioners, the present value of the expected future pension payments including the allowance for the future expenses of maintaining future pensions, is used to determine the vested benefit.

The following tables show the calculation of the various VBI measures as at 31 December 2021 along with the corresponding figure as at the date of the previous investigation.

South32 DB category

Date	Net Market value of DB Assets for South32 DB ($m)	South32 Actives DB Vested benefits ($m)	South32 Pensioners Vested benefits ($m)	Total South32 DB Vested benefits ($m)	South32 DB VBI (%)
31 December 2021	**23.6**	14.9	7.7	**22.6**	**104.7**
31 December 2018	**32.3**	25.8	7.7	**33.5**	**96.4**

The vested benefits for the South32 DB category includes the value of the current lifetime pension liabilities and the expected value of the pension (using the assumed take up rates) for active members currently over preservation age.

The DB VBI for the South32 DB category is higher than at 31 December 2018. This has been caused by a number of factors, including:

- Asset transfers totalling $1.5 million from the WASF DB reserve over the investigation period;
- Investment earnings higher than expected and salary increases lower than expected over the three years since 1 January 2019; and

- A higher discount rate used to value lifetime pension liabilities and the pension uplift allowed for in the vested benefits of active members currently over preservation age.

The above have been partially offset by:

- Higher than expected take-up of the lifetime pension option on retirement by active members;
- The transfer out of the TEMCO assets and liabilities; and
- The increase in the assumed pension take up allowed for in the vested benefits of members currently over age preservation age.

WASF DB category

Date	Net Market value of DB Assets for WASF DB ($m)	WASF DB Vested benefits ($m)	WASF DB VBI (%)
31 December 2021	15.6	10.0	156.4
31 December 2018	18.1	11.1	163.6

The DB VBI for the WASF DB members has decreased since the previous investigation date due to a number of factors, including:

- Asset transfers out totalling $1.5 million to the South32 DB reserve; and
- Continued contribution holiday in respect of the WASF DB category

The above have been partially offset by:

- Investment earnings higher than expected and salary increases lower than expected over the three years since 1 January 2019.

All Plan DB members

Date	Net Market value of DB Assets ($m)	DB Actives Vested Benefits ($m)	Pensioners Vested Benefits ($m)	DB Vested Benefits ($m)	Overall DB VBI (%)
31 December 2021	39.3	24.9	7.7	32.6	120.6
31 December 2018	50.4	36.9	7.7	44.6	113.1

This is the VBI used by the Trustee to consider the overall funding of the DB liabilities and for other compliance purposes, such as reporting to APRA.

Overall, as at 31 December 2021, the DB Assets cover the DB Vested Benefits with a comfortable margin.

A Vested Benefits Index greater than 100% indicates that the Plan was in a satisfactory financial position as at the investigation date.

Actuarial Value of Accrued Benefits

A further indication of the funding status of a plan is given by the ratio of the plan's assets to the Actuarial Value of Accrued Benefits ("AVAB"), called the Actuarial Value of Accrued Benefits Index ("ABI").

AVAB represents the value in today's dollars of expected future benefits based on membership completed to the review date, allowing for future salary increases, investment earnings and expected incidence of payment (based on the actuarial assumptions set in Appendix B of this report). Generally, where a positive "gap" is assumed (as is the case for the South32 section in this investigation of the Plan), the value of the AVAB is lower than the vested benefits as the AVAB allows for future earnings in excess of future salary growth. For a closed fund, the AVAB is expected to increase to equal (or exceed) the vested benefits as the membership ages, as the period between calculation and assumed exit is gradually reduced.

The following tables show the calculation of the ABI as at 31 December 2021 along with the corresponding figure as at the date of the previous investigation.

South32 DB category

Date	Net Market value of DB Assets for South32 DB ($m)	AVAB for South32 DB Actives ($m)	AVAB for South32 Pensioners ($m)	Total AVAB for South32 DB members ($m)	South32 DB ABI (%)
31 December 2021	23.6	14.7	7.7	22.4	105.5
31 December 2018	32.3	26.0	7.7	33.7	95.9

WASF DB category

Date	Net Market value of DB Assets for WASF DB ($m)	AVAB for WASF DB members ($m)	WASF DB ABI (%)
31 December 2021	15.6	10.0	156.5
31 December 2018	18.1	11.0	165.3

All Plan DB liabilities

Date	Net Market value of DB Assets ($m)	AVAB for DB Actives ($m)	AVAB for Pensioners ($m)	AVAB for DB members ($m)	Overall DB ABI (%)
31 December 2021	39.3	24.7	7.7	32.4	121.2
31 December 2018	50.4	36.9	7.7	44.6	113.0

The Overall DB ABI has increased since the previous investigation date primarily due to the increase in the valuation gap for South32 members and investment earnings higher being than expected and salary increases lower than expected over the three years since 1 January 2019.

Superannuation Guarantee Minimum Requisite Benefits

Superannuation Guarantee Minimum Requisite Benefits (MRBs) are the minimum benefits required to be paid in respect of a member to satisfy Superannuation Guarantee legislation. Regulation 9.06(3) of the Superannuation Industry (Supervision) Regulations defines a superannuation plan to be “technically insolvent” if its market value of assets is not sufficient to cover its accrued MRBs.

The MRB Index compares the market value of assets to the MRBs of members at the investigation date.

The following tables show, to the extent possible, the coverage of DB MRBs as measured by the DB MRB Index (MRBI) as at 31 December 2021 along with the corresponding figure as at the date of the previous investigation.

South32 DB category

We understand that the administrator has completed the coding of South32 MRBs as recommended in the 2018 report. However, we were advised that there have been issues with some of the data received for the MRB calculation and, as such, reliable MRB values as at 31 December 2021 were unable to be provided. Therefore, for the purposes of this investigation, we have estimated the MRB for the South32 DB category. The MRB for pensioners is taken to be equal to the value of their pension benefit.

Consistent with the 2018 report, the MRB for active South32 DB members has been estimated to equal 80% of their vested benefits. We believe that this remains a reasonable (and conservative) estimate based on some approximate calculations undertaken. The MRBI results on this basis as at 31 December 2021 are shown in the table below.

Date	Net Market value of DB Assets for South32 DB ($m)	South32 DB MRBs ($m)	South32 DB MRBI (%)
31 December 2021	23.6	19.6	120.6
31 December 2018	32.3	26.8	120.6

Based on the estimated MRBs, we conclude that the MRBI for the South32 DB category members remains above 100% at the investigation date.

We note that it is important for the MRBs to be properly administered and confirming the correct MRBs are recorded should be a priority for the administrator.

WASF DB category

It is our understanding that the MRBs for WASF DB members are not currently coded and the administrator has made a decision not to do so, based on an assessment that the MRB would not apply. We are therefore unable to determine the exact coverage of the WASF DB MRBs by the WASF DB Assets. However, the MRB benefit accrual rate means it is highly likely that the total vested benefits exceed the total MRBs, now and for some future time. Noting that the VBI for the WASF DB category is well above 100% it is reasonable to expect that the total of the WASF DB MRBs is also substantially less than the total amount of the WASF DB Assets, i.e. the WASF DB MRBI is well over 100%.

Under the Prudential Standards the Trustee has an obligation to ensure that a regular actuarial investigation includes an indication of the MRB liability and a statement regarding solvency. While it is possible to provide this information while the VBI is well above 100%, it would be problematic to provide a statement about solvency if the VBI were close to or below 100%.

For the purposes of reporting an MRBI in this investigation, and consistent with the method adopted at the previous investigation, we have assumed (conservatively) that the MRBs for WASF DB members are equal to their vested benefits. The MRBI results on this basis as at 31 December 2021 are shown in the table below.

Date	Net Market value of DB Assets for WASF ($m)	WASF DB MRBs (estimated) ($m)	WASF DB MRBI (%)
31 December 2021	15.6	10.0	156.4
31 December 2018	18.1	11.1	163.6

The movement in the MRBI reflects the change in the VBI because the vested benefits are used as the MRB estimate at both this and the previous investigation.

We recommend that the Trustee review the assessment of the MRB relative to vested benefits nearer to the time that the SG rate increases to 12% (from 1 July 2025) to confirm whether its assessment that the MRB will continue not to apply remains valid, bearing in mind the actual membership at that time.

All Plan DB liabilities

Accurate MRB information has not been provided and as such we have been unable to calculate the MRB for all the DB members. Nonetheless, on the basis that it is reasonable to expect that the MRBI is over 100% for both the South32 DB category and the WASF DB category, it is therefore also reasonable to expect that the MRBI for all DB members and for the Plan overall are also both over 100%.

For the purposes of reporting an MRBI for DB liabilities overall, we applied the same MRB estimates as outlined above. The MRBI results based on our estimate as at 31 December 2021 are shown in the table below.

Date	Net Market value of DB Assets ($m)	MRBs for DB members ($m)	Overall DB MRBI (%)
31 December 2021	39.3	29.6	132.7
31 December 2018	50.4	37.9	133.1

The administrator has advised that the South32 MRBs were not reliably calculated for this investigation due to some information received from the employer being inaccurate. There is a risk that, if at some time in the future the DB VBI falls below 100%, the use of estimated MRBs will make it difficult to determine the actual solvency of the DB liabilities relative to their MRBs. This might result in the Plan being considered technically insolvent when in fact a margin over the MRBs exists.

Currently, this risk is mitigated by the healthy funding position, however as noted above we recommend the MRBs be administered accurately so that the solvency of the Plan can be reliably determined on a quarterly basis and the administrator address any data deficiencies with the employer.

Retrenchment Benefits

On retrenchment, members in the South32 DB section are entitled to the member's reserve in the Plan, the value of this amount as defined in the Participation Agreement is equal to the vested benefits. For members covered under the WASF section of the Participation Agreement the retrenchment benefit is at least equal to the vested benefits for all members.

The retrenchment benefit index is therefore equal to the VBI for each DB category, the DB categories combined and the Plan overall. Importantly, this also means the coverage of retrenchment benefits for the Plan overall is above 100%.

Summary of Key Indices for the Plan

We have set out below the key indices for the total Plan as at 31 December 2021 on the basis, assumptions and use of estimates as set out above:

As at 31 December 2021	VBI%	ABI%	MRBI%
South32 DB category	104.7	105.5	120.6
WASF DB category	156.4	156.5	156.4
All DB members	120.6	121.2	132.7

We have determined that the VBI for the DB Plan as at 31 December 2021 was 120.6% which is higher than the VBI for the DB Plan as at 31 December 2018. A VBI above 100% indicates that the Plan was not in an "Unsatisfactory Financial Position" as at 31 December 2021 as defined in section 9.04 of the Superannuation Industry Supervision (SIS) Regulations.

Experience since 31 December 2021

The investment return on the DB Assets for the three months ending 31 March 2022 was -1.1% and -2.1% for South32 and WASF respectively, resulting in an estimated VBI as at 31 March 2022 in relation to DB liabilities of 117.6% (104.4% for the South32 DB category and 149.4% for the WASF DB category), approximately 3% lower than as 31 December 2021.

Returns from 1 April 2022 to 14 June 2022 are estimated to be -3.6% for both South32 and WASF, which is expected to have further weakened the coverage of vested benefits. The expected impact is shown in Section 7.

Shortfall Limit

Under SPS 160, Trustees are required to set a shortfall limit which represents the level at which a plan can reasonably expect that funding of defined benefit liabilities can be restored to a satisfactory financial position within one year.

As at 31 December 2021, the shortfall limit for the Plan was 100% - and we note this applies to the DB VBI (i.e. the VBI for the combined DB liabilities). Hence the Plan was above its shortfall limit as at 31 December 2021. If the Plan's experience is as assumed, it will not breach its shortfall limit in the period to the next triennial Actuarial Investigation (to be carried out no later than 31 December 2024) based on the recommended contributions and assumptions adopted for this investigation.

Given the investment strategy of the Plan, we believe that the shortfall limit remains appropriate.

Insurance Arrangements

The Plan provides death and total and permanent disablement (TPD) benefits for members of the Plan. The administrator has previously provided us with a copy of the insurance policy.

The death and TPD benefits of each South32 DB member and WASF DB member are met by the combination of the vested benefit and insurance cover. The insurance cover is insured by TAL with the amount of cover based on the lump sum Death /TPD benefit less the member's lump sum vested benefit. If vested benefits are not fully covered by assets, there is effectively some “uninsured” risk. Note that the vested benefit used for this calculation does not include a pension uplift for eligible members and only refers to the lump sum benefit.

The table below considers the total lump sum death / TPD benefits, available assets and insurance cover to illustrate the coverage of the death and TPD benefits in the event all DB members claimed at the investigation date:

	$m
Death / TPD Benefits (A)	29.9
Amount of Insurance Cover (B)	5.5
Net Value of Assets* (C)	31.6
Excess of assets over Death/Disablement risk (B+C)-A	7.2

* Amount excludes current pension assets.

As at 31 December 2021, the combination of the DB assets available plus the insurance cover exceeded the Death and Disablement benefits at risk by approximately $7.2 million, suggesting that the Plan has sufficient coverage if all members were to be eligible for a death/TPD benefit at the investigation date.

We note that the death/TPD benefits above (and on which insurance cover is determined) assumes that these benefits are taken as a lump sum only and do not allow for the potential for these benefits to be taken as a pension in respect of some South32 DB members. As such, the value of these benefits above might be understated (by up to approximately $1.5 million). As such, we believe the insurance arrangements remain appropriate and there have been no changes that would cause this conclusion to be changed.

However, given the reasonable level of excess above the death/disablement benefits the Trustee may wish to review the level of insurance cover and the basis on which the cover is determined. We would be happy to assist with such a review.

Section 7: Projection of Financial Position

The funding indices shown in Section 6 of this report relate to the current financial position of the Plan as at 31 December 2021. A projection of the Plan's assets and liabilities is required to assess the adequacy of the employer contribution rate to provide defined benefits in the future.

Such a projection has been carried out using the funding method set out in Section 5 (involving the projection of the DB VBI for ten years) and the assumptions set out in Appendix B.

As a starting point for determining the recommended employer contribution rates, we have first considered the future service cost of providing the benefits for each benefit category, as well as the impact of any under or over funding of the category's liabilities at the investigation date.

Long-Term Contribution Rate – Adjusted Future Service Cost

South32 DB category

	South32 DB ($'000)
Net Value of Assets	23,644
Expected Present Value of Past Service Liabilities	22,415
Past Service Surplus/(Deficit)	**1,229**
Expected Present Value of:	
Future Service Benefit Liability (net of member contributions)	1,117
Future Expenses	261
Future Insurance Costs	78
Future Service Liability	**1,456**
Present values of Future Salaries (accruing members only)	**8,679**

	% of accruing members' salaries
Future Service Benefit Contribution rate	**16.8%**
Contribution Tax	2.3%
Contribution Rate for Benefit Accruing and Expenses	**19.0%**
Adjustment for Past Service (Surplus)/Deficit, including contribution tax	-16.7%
Long-term Contribution Rate	**2.4%**

In relation to the South32 DB category:

- The employer contribution rate expected to be required to fund the accrual of future service benefits is 19.0%. This includes the annual cost of insurance as well as the present value of future plan expenses and contributions tax;
- The above rate does not allow for the current funding position or the funding objective of maintaining a buffer in the DB VBI. Allowing for the financial position only, the long-term contribution rate required to meet the Plan's liabilities on an ongoing basis is expected to be 2.4% of South32 DB members' salaries.

  As seen, the past service surplus has a material impact on the contribution rate as it is large relative to ongoing salaries.
- A long-term contribution program of 2.4% of salaries for South32 DB members has been calculated.

The long-term contribution rate for the South32 DB category has reduced materially since the last investigation (where it was 31.9% of salaries) primarily due to:

- The improvement in the funding position since the last investigation;
- The change in the financial assumptions (in particular the increase in the long term expected earning rate) having a positive impact on the contribution rate (we note that the long-term contribution rate under the 2018 investigation assumptions is 12.5% of salaries);
- The increase in the pension take up rate assumption having a slightly negative impact on the contribution rate;
- The actual take-up of lifetime pensions being greater than the expected number of pensions, this puts a strain on the surplus of the assets over accrued "past service" liabilities; and
- The transfer out of the TEMCO members.

WASF DB category

	WASF DB ($'000)
Net Value of Assets	15,640
Expected Present Value of Past Service Liabilities	9,992
Past Service Surplus/(Deficit)	**5,648**
Expected Present Value of:	
Future Service Benefit Liability (net of member contributions)	909
Future Expenses	165
Future Insurance Costs	50
Future Service Liability	**1,123**

As the past service surplus is more than adequate to fund the future service liability, the long-term contribution rate in relation to the WASF DB members remains at 0% of members' salaries, despite the reduction in the long term expected earning rate.

We have determined that, in relation to the WASF DB category:

- The employer contribution rate expected to be required to fund the accrual of future service benefits is 23.2%. This is marginally lower than normal cost of 23.7% calculated at the previous investigation; and
- Allowing for the financial position, which is very strong for the WASF DB category, the long-term contribution rate required to meet the Plan's liabilities on an ongoing basis remains nil, consistent with the previous investigation results.

Projected Benefit Funding (i.e. VBI projection)

Using the assumptions set out in Section 5, we have projected the Plan's DB VBI over the next ten years, for the South32 DB category and WASF DB category separately as well as combined.

We note that it is the funding of the combined DB liabilities that is the main concern of the Trustee and on which legislative compliance reporting is based. Nonetheless, it may be appropriate to discuss with the employer a funding protocol to be adopted when the VBI projections for an individual DB category fall below (or be expected to fall below) 100%.

For this investigation, as previously, we have adopted a funding objective of targeting a VBI of 105% for defined benefits liabilities.

Changes and Events since 31 December 2021

The investment return on the DB Assets to 14 June 2022 was approximately -4.7% and -5.6% for South32 and WASF respectively. Our projections below allow for this known investment experience from 31 December 2021 to 14 June 2022.

Our projections for the individual DB sections also allow for the known transfer of $500,000 that occurred from the WASF DB reserve to the South32 DB reserve in March 2022.

There have been no other events occurring that would materially affect the projections or resulting recommendations. We have therefore not taken into account any other changes since 31 December 2021 when projecting the DB VBI.

Projection of Vested Benefit Index – long term contribution rate

In performing this projection, we have assumed, as a starting point, that the employer will contribute as indicated by the long term contribution rate calculation (which also reflects the employer's preference to fund each category independently), i.e.:

- Continuation of the current contribution rate for the GEMCO employee in the South32 DB category to 30 June 2022 of 31.6% of salaries;

- Nil until 30 June 2022 and 2.4% of salaries in respect of all South32 DB members thereafter, including the GEMCO employee; and
- Nil in respect of WASF DB members.

The following table summarises the results of the DB VBI projections on the contribution program set out above.

	Long term contribution rate program		
Date	South32 DB VBI	WASF DB VBI	Overall DB VBI
31 December 2021	104.7%	156.4%	120.6%
31 December 2022	99.6%	164.5%	115.1%
31 December 2023	98.7%	176.0%	115.7%
31 December 2024	97.7%	188.9%	116.3%
31 December 2025	96.4%	205.0%	116.5%
31 December 2026	95.1%	226.0%	116.9%
31 December 2027	93.6%	256.4%	117.1%
31 December 2028	92.3%	299.8%	118.0%
31 December 2029	91.1%	369.0%	119.2%
31 December 2030	88.9%	484.7%	119.4%
31 December 2031	87.5%	694.1%	120.8%

* Based on 31 December 2021 assumptions as set out in Section 5.

The WASF DB VBI remains well above 100% even with a contribution holiday. This reflects that each exit increases the VBI further and that for a small membership with short future service periods there is little opportunity to fully utilise the surplus through a contribution holiday.

The VBI projections also show that if the South32 DB category contribution rate was 2.4% of salary and if the employer contribution holiday continued for WASF DB category, the overall DB funding is expected to comfortably remain over 105% (on the assumptions used) for all future years. However, the projections also show that the VBI for the South32 section is expected to remain below 100% and decrease steadily over time. This is mainly due to the impact of the poor investment return experience from 31 December 2021 to 14 June 2022, which is expected to have weakened the section's VBI to below 100%.

Projection of Vested Benefit Index – alternate contribution program

Since 2020, there have been annual transfers of $1 million from the WASF DB reserve to the South32 DB reserve which has improved the VBI for the South32 DB category. We understand that the $1 million reflects the approximate annual long-term cost of 31.6% (as calculated in a prior investigation) of salaries in relation to the South32 DB members.

The results of this investigation show that the long-term cost for South32 DB members has now reduced to 2.4% of salaries at 31 December 2021. As such, we believe there is scope for the level of assets transferred from the WASF DB assets to the South32 DB assets to reduce. We have provided projections below based on annual transfers of $500,000 from 30 June 2022. While this amount is higher than the expected annual cost at the long-term contribution rate, it takes into consideration the potential issues that may arise with excess surplus within the WASF DB category when the final WASF DB member exits the Plan. However, we note that the intention of these transfers is to use the surplus within the WASF section of the Plan to strengthen the position of the South32 section of the Plan and that the transfers do not have a material impact on the financial position of the overall Plan.

The projected VBI below allows for the $500,000 annual transfers to continue until the next investigation date (being 31 December 2024) and a continuation of the current contribution holiday for the South32 DB category. We have also assumed contributions currently paid for the GEMCO employee will cease, i.e., a contribution program of:

- Continuation of the current contribution rate (of 31.6% of salary) for the GEMCO employee in the South32 DB category to 30 June 2022 and nil thereafter; and
- Nil in respect of South32 (excluding the GEMCO employee) and WASF DB members from 1 January 2022.

We have also assumed that the transfer of $500,000 p.a. from the WASF DB reserve to the South32 DB reserve will continue until 31 December 2024.

The projected VBI under the revised contribution program above would be:

	Nil contributions and $500,000 p.a. asset transfer from WASF to South32		
Date	**South32 DB VBI**	**WASF DB VBI**	**Overall DB VBI**
31 December 2021	104.7%	156.4%	120.6%
31 December 2022	100.7%	160.7%	115.1%
31 December 2023	102.4%	162.0%	115.6%
31 December 2024	104.7%	160.5%	116.0%
31 December 2025	104.0%	170.2%	116.3%
31 December 2026	103.3%	183.1%	116.6%
31 December 2027	102.5%	201.9%	116.9%
31 December 2028	102.0%	229.0%	117.8%
31 December 2029	101.8%	272.6%	119.1%
31 December 2030	100.5%	345.8%	119.4%
31 December 2031	100.2%	478.5%	121.0%

As expected, relative to the VBI projections under the long-term contribution rate program, the estimated VBI for the WASF category under these projections is lower (although still very strong) and the corresponding VBI for the South32 category is higher.

Given the potential complexity and administrative burden in restarting contributions for the South32 DB members (at the relatively low long-term rate of 2.4% of salary), the tremendously strong position of the WASF DB section being able to support the continued transfer of funds to the South32 section and the projected DB VBI of the overall Plan expected to remain strong, we recommend the contribution program above be adopted and that the Company consider the annual transfer of assets from the WASF DB reserve to the South32 DB reserve continuing at the revised annual amount of $500,000 (reduced from the current annual amount of $1 million).

For comparative purposes, the table below shows the projected VBI if contributions cease from 1 July 2022 and the annual $500,000 transfer of assets from the WASF DB reserve to the South32 DB reserve do not occur:

Date	Nil contributions and no asset transfers		
	South32 DB VBI	WASF DB VBI	Overall DB VBI
31 December 2021	104.7%	156.4%	120.6%
31 December 2022	99.5%	164.5%	115.0%
31 December 2023	98.4%	176.0%	115.5%
31 December 2024	97.2%	188.9%	115.9%
31 December 2025	95.8%	205.0%	116.0%
31 December 2026	94.2%	226.0%	116.2%
31 December 2027	92.5%	256.4%	116.2%
31 December 2028	91.0%	299.8%	116.9%
31 December 2029	89.7%	369.0%	117.9%
31 December 2030	87.2%	484.7%	117.9%
31 December 2031	85.6%	694.1%	119.1%

As expected, the projected VBI is marginally lower than under the long-term contribution rate program. The overall VBI and WASF DB VBI is expected to remain strong, however the projected VBI for the South32 section is expected to gradually weaken further. The annual $500,000 asset transfer from the WASF DB section to the South32 DB section is expected to maintain the South32 section's VBI above 100%.

We note that the expected VBI for the overall Plan is expected to be slightly lower in the long term if the asset transfers do not take place as the $500,000 p.a. is being transferred into South32's DB assets which have a higher allocation to growth asset classes (and a higher expected rate of return).

Considerations for GEMCO employee

Contributions for the GEMCO employee are currently being made at the rate of 31.6% of salary. We understand that South32's preference was for these contributions to continue when the contribution holiday commenced in respect of the remaining South32 DB members in March 2020 due to the ownership structure of GEMCO (i.e. it is 60% owned by South32 and 40% owned by Anglo America).

The above results have assumed contributions in respect of the GEMCO employee cease from 1 July 2022, however we would be comfortable for these contributions to continue at the current rate of 31.6% if that is South32's preference and acceptable to Anglo America. We note that it is also possible for the contributions in respect of the GEMCO employee to be revised to the long-term contribution rate determined in this investigation, of 2.4% of salaries, however we expect this will still require discussions to be held between South32 and Anglo America and, as a result, it would possibly be simplest for employer contributions to cease for this employee also.

Other considerations

Based on the VBI projection, it is likely that some of the assets attributable to the WASF DB category will remain surplus to that category's funding requirements even after the last member exits. The question therefore arises as to the possible uses or treatment of assets considered to be "surplus" - either while the category is ongoing or when the last member leaves. We recommend that legal opinion on the options available for using this surplus be sought by the Trustee.

In considering how to manage this "surplus", it would be appropriate to also discuss the options with the employer, including whether the possible uses can or should involve the overall DB liabilities, accumulation members or be restricted to the WASF DB liabilities and/or WASF Accumulation members.

Finally, it is important to remember that while assets may be <u>expected</u> to be surplus at a point in time, it is only when the final benefit is paid that this can actually and finally be determined. Currently the risk of the assets being insufficient is reasonably low because of the high overall VBI. If some of the assets attributable to the WASF DB category are used other than for funding of the WASF DB liabilities the risk of an insufficiency increases, and at some point in the future it may be necessary for the employer to recommence contributions to fund accruing benefits and/or remediate a funding deficit.

Sensitivity to financial and other assumptions

It is important to understand how future experience may affect the Plan's financial position and how the employer's contribution requirements may change as a result.

In considering how the funding may be affected, it is important to understand that the Plan's liabilities are mature and the accrued entitlements larger than expected future accruals. As a result, the impact of adverse experience on the assets (i.e. earning rates lower than expected, or significant market downturns) can materially affect the funding position and consequently the employer contribution rate.

To further illustrate the impact of the real rate of return on the funding position, we have recalculated the VBI projections assuming that the assumed investment return was 1% lower and assuming that the salary inflation assumption was 1% higher, resulting in a real return that is 1% lower.

The contribution program for all scenarios (including base) below is:

- Continuation of the current contribution rate (of 31.6% of salary) for the GEMCO employee in the South32 DB category to 30 June 2022 and nil thereafter; and
- Nil in respect of South32 and WASF DB members from 1 January 2022.

The scenarios also allow for the transfer of $500,000 p.a. from the WASF DB reserve to the South32 DB reserve until 31 December 2024.

	Overall DB VBI		
Date	**Base Scenario**	**Scenario 2 - assuming 1% higher salary inflation**	**Scenario 3 - assuming 1% lower return**
31 December 2021	120.6%	120.6%	116.4%
31 December 2022	115.1%	115.1%	109.2%
31 December 2023	115.6%	115.3%	108.2%
31 December 2024	116.0%	115.1%	107.0%
31 December 2025	116.3%	114.6%	105.3%
31 December 2026	116.6%	114.2%	103.7%
31 December 2027	116.9%	113.7%	101.8%
31 December 2028	117.8%	113.7%	100.4%
31 December 2029	119.1%	114.1%	99.2%
31 December 2030	119.4%	113.6%	96.7%
31 December 2031	121.0%	114.2%	95.3%

The results in the table above shows that the projected overall DB VBI position is more sensitive to the return achieved by the Plan’s assets. Note that the starting VBI is also affected in Scenario 3 because the assumed return affects the value placed on the pension liabilities.

In Scenario 2 where the salary inflation assumption is 1.0% higher, the starting VBI is not affected because the vested benefits are not dependent on future salary inflation. The projected overall DB VBI is still expected to increase over the next ten years, albeit lower than the Base Scenario. This is because a large proportion of the Plan’s benefits are in relation to pension liabilities or allowance for pension take up for active members (both at the calculation date and merging in future) which is not affected by the salary inflation assumption.

In Scenario 3 where the return is 1.0% lower, the projected overall DB VBI starts from a lower value and continues to reduce over the next ten years, eventually falling below 100% by 31 December 2029.

We also show the change in VBI projection for the South32 DB category only, as even this small change in assumption materially affects the expected progression of its DB VBI.

	South32 DB VBI		
Date	**Base Scenario**	**Scenario 2 - assuming 1% higher salary inflation**	**Scenario 3 - assuming 1% lower return**
31 December 2021	104.7%	104.7%	99.5%
31 December 2022	100.7%	100.7%	94.3%
31 December 2023	102.4%	102.2%	94.7%
31 December 2024	104.7%	103.9%	95.5%
31 December 2025	104.0%	102.8%	93.3%
31 December 2026	103.3%	101.6%	91.1%
31 December 2027	102.5%	100.2%	88.8%
31 December 2028	102.0%	99.2%	86.8%
31 December 2029	101.8%	98.4%	84.9%
31 December 2030	100.5%	96.5%	81.7%
31 December 2031	100.2%	95.6%	79.6%

The South32 DB VBI reduces to 79.6% over the period of the projection under Scenario 3. The currently identified surplus in the WASF DB category is also not expected to sufficiently maintain the overall DB VBI above 100% over the ten year projection period (it is expected to reduce to 99.2% by 31 December 2029).

The WASF VBI is expected to remain well above 100% under all scenarios – with lower than expected earnings mitigated by the existing DB VBI margin. However, if earning rates are higher than expected, the issue of how the surplus assets are used is exacerbated.

While these sensitivity tests have been selected to provide a range of possible economic outcomes, they do not represent upper or lower bounds for all possible outcomes.

Changes to Assumption on Pension Take-up

As noted in Section 5, in this investigation we have assumed that 33% of eligible members will elect to receive their retirement benefits as a lifetime pension. We have also considered the impact on funding (and hence the employer contribution rate) of assuming 50% of eligible members choosing to take their benefit as a lifetime pension. This scenario shows the impact that member elections to take the pension benefit may have on the Plan's financial position and the employer's contribution requirements.

The table below sets out the projected VBI under these scenarios:

	Overall DB VBI		South32 DB VBI	
Date	Base - assuming 33% of eligible members take lifetime pension	Scenario 4 - assuming 50% of eligible members take lifetime pension	Base - assuming 33% of eligible members take lifetime pension	Scenario 4 - assuming 50% of eligible members take lifetime pension
31 December 2021	120.6%	119.6%	104.7%	103.5%
31 December 2022	115.1%	113.0%	100.7%	98.5%
31 December 2023	115.6%	112.8%	102.4%	99.6%
31 December 2024	116.0%	112.5%	104.7%	101.1%
31 December 2025	116.3%	111.9%	104.0%	99.7%
31 December 2026	116.6%	111.3%	103.3%	98.4%
31 December 2027	116.9%	110.6%	102.5%	96.8%
31 December 2028	117.8%	110.6%	102.0%	95.8%
31 December 2029	119.1%	110.8%	101.8%	94.9%
31 December 2030	119.4%	109.6%	100.5%	92.7%
31 December 2031	121.0%	109.9%	100.2%	91.7%

Comparing the Base projections against Scenario 4 shows that assuming a higher pension take up reduces the VBI immediately (as the vested benefit for any South32 DB members currently over preservation age includes a greater element of the higher valued pension entitlement) and also over the projection period. However, under the alternate assumption considered, the projected overall DB VBI position and the South32 DB VBI are still expected to remain above 100%.

Despite the strong financial position of the Plan as at 31 December 2021, the impact of the pension assumption on the VBI is expected to still be material. We will continue to monitor the pension take up as part of the regular quarterly financial position updates.

While these sensitivity tests have been selected to provide a range of possible economic outcomes, they do not represent upper or lower bounds for all possible outcomes.

Contribution Recommendations

As a result of this investigation, we recommend that:

- the employer contribute at the current rate of 31.6% of salary for the GEMCO employee in the South32 DB category until 30 June 2022;
- the employer contribution rate in respect of the GEMCO employee be nil from 1 July 2022; and
- the employer contribution rate in respect of South32 DB members (excluding the GEMCO employee) and the WASF DB category members continue to be nil.

In addition we recommend that salary sacrifice member contributions for DB members, OTE top-up contributions for WASF DB members and contributions in respect of Accumulation members continue to be paid as required under the provisions of the Plan and relevant employment agreements.

We also recommend the Company consider regular asset transfers of $500,000 p.a. from WASF DB assets to South32 DB assets from 30 June 2022 until 31 December 2024.

Section 8: Certification required under SPS 160 in respect of pension liabilities

Paragraph 23(h) of SPS 160 requires the Actuary to form an opinion as to whether there is a high degree of probability that the Plan will be able to pay the pension as required under the Plan's governing rules.

In forming this opinion, it is necessary to identify the assets which would be available to finance future pension payments. The principles set out in PS410 and Guidance Note 465 issued by the Institute of Actuaries of Australia require the Actuary to consider which assets would be available to meet the current pension liabilities (after allowing for benefit liabilities which rank ahead of or equally with the current pensions) if the Plan were to be wound up.

Under the MLC Super Fund Trust Deed, the clause setting out priorities for the allocation of assets on termination of a sub-plan gives pensioners priority over active members. However, SIS Regulations require the MRBs of members to be given equal priority.

The funding objective of maintaining the DB VBI above 100% under SPS 160 combined with the current strong financial position of the Plan and the priority of pensions over active members in a fund termination, allows us to conclude that there is a high degree of probability that the Plan will be able to pay the pensions on an ongoing basis.

While this statement may be made at the current time, based on a combined Plan VBI comfortably over 100% and an asset allocation with a large proportion in defensive assets, as the number of active members reduces over time (and particularly if the number of pensioners increases) there may come a point where we can no longer make this statement without a larger funding margin or without knowing the MRBs for active members more accurately.

Section 9: Material Risks

The funding of the defined benefit liabilities is dependent upon future experience. As part of this investigation we have briefly considered the following to be the material risks associated with the actuarial assumptions used in the investigation and that relate directly to the ongoing actuarial management of the Plan.

Investment Risk

A significant risk facing the Plan in relation to the funding of the Defined Benefit liabilities is that investment returns will not be as high as expected. If that were to occur, the Plan's overall DB VBI may fall below 100% or the shortfall limit. If this were to occur, the current contribution program might need to be amended prior to the next actuarial investigation.

We note that the volatility in investment returns is mitigated somewhat by the defensive asset allocations. Also, the VBI for the WASF DB category is comfortably above 100%, which further mitigates the risk that lower returns cause the VBI to fall under 100% in relation to both that group of members and the Plan overall – though if the VBI were to fall materially the contribution recommendations would need to be reviewed.

The VBI for the South32 DB category is slightly over 100%, so that investment returns lower than expected may easily cause the South32 DB VBI to fall below 100%.

Salary Inflation Risk

Salary increases exceeding expectations will have a negative impact on funding.

However, it is the excess of the investment return above the rates of salary and price inflation increases that is most important because the assets increase with the investment return and the liabilities with salary or price inflation.

South32 should be aware of the impact on the defined benefit liabilities of higher than expected salary growth.

In accordance with APRA's reporting requirements, the Trustee will monitor the VBI on a quarterly basis and as such would identify if the funding position is deteriorating as a result of investment performance or salary increases.

Pensioner Liability Risk

In respect of the South32 DB category pension option, we have assumed that 33% of all eligible retiring members will elect to take pension benefits on retirement after preservation age, noting that under the current assumptions the present value of the pension is higher than the lump sum benefit.

There is a risk that the number of members electing a pension and the proportion of benefit taken as a pension increase, increasing the cost of benefits being provided under that category. It is also possible that, if more members elect a pension benefit in the future, the Plan (and the South32 DB category in particular) becomes further exposed to risks associated with increasing life expectancy. This may be difficult to manage if the pool of active members relative to pensioners continues to become smaller. South32 should be aware of this risk.

Legislation Risk

In the Prudential Standards (SPS 160), funds with a VBI of lower than 100% will be required to restore their VBI to 100% or above within three years. As the Plan's VBI is currently over 100%, this is not a major issue for the Plan. However, should the Plan's VBI fall below 100%, South32 will be required to make additional contribution to restore the Plan's VBI within three years. The amount and materiality of this contribution requirement cannot be estimated in advance.

We note that in relation to this risk it is the overall Plan DB VBI that is considered relevant under SPS 160.

There is a risk that legislation changes could impact on funding. For example by impacting investment returns or other aspects of experience or by changes to the tax regime (e.g. removing the tax exemption on pension assets).

There is also a risk that, if the Plan's DB VBI fell under 100%, it may be difficult to assess the actual solvency position of the Plan relative to MRBs because the MRBs for the WASF DB members are not coded and the MRBs for the South32 DB members are not accurately administered. This might result in the Plan being considered technically insolvent, when in fact a margin over the MRBs exists. This risk is currently mitigated by the strong funding position.

Risk of Benefit Payment when the VBI is under 100%

The risk of a large number of benefit payments (such as resignations, retrenchments or death and disablement benefits) when the VBI is under 100%. This is mitigated at this time by the strong overall financial position of the Plan's defined benefit liabilities, however may need to be considered more closely should the DB VBI reduce significantly or fall under 100%. If the DB VBI were to fall under 100%, the employer may be required to make additional contributions.

As discussed in relation to investment risk, the VBI for the WASF DB category is comfortably above 100%, which mitigates the risk that the VBI falls below 100% and the funding for the category is therefore exposed to the adverse impact of benefit payments.

The VBI for the South32 DB category is currently slightly over 100% but is expected to reduce to around 100% by 31 December 2022 and may deteriorate further with adverse experience. The risk of benefit payments when the VBI is under 100% is therefore greater for this category and would be expected to adversely impact the South32 DB VBI.

Other Risks

There are other risks in respect of the Plan which we have not included as we do not consider them to be currently material.

Section 10: Conclusions and Recommendations

Probability of Paying Pensions

Paragraph 23(h) of SPS 160 requires the Actuary to form an opinion as to whether there is a high degree of probability that the Plan will be able to pay the pensions as required under the Plan's governing rules.

In my opinion, on the basis of the analysis conducted as part of this actuarial investigation there is a high degree of probability that the Plan will be able to pay pensions on an ongoing basis. In making this statement I note that I have considered the overall funding of the Plan's DB liabilities.

Employer Contributions

As a result of my investigation, we recommend that:

- the employer contribute at the current rate of 31.6% for the GEMCO employee in the South32 DB category until 30 June 2022;
- the employer contribution rate in respect of the GEMCO employee be nil from 1 July 2022; and
- the employer contribution rate in respect of South32 DB members (excluding the GEMCO employee) and the WASF DB category members continue to be nil.

In addition we recommend that salary sacrifice member contributions for DB members, OTE top-up contributions for WASF DB members and contributions in respect of Accumulation members continue to be paid as required under the provisions of the Plan and relevant employment agreements.

We also recommend the Company consider regular asset transfers of $500,000 p.a. from WASF DB assets to South32 DB assets from 30 June 2022 until 31 December 2024.

Insurance Arrangements

In respect of the Plan's insurance arrangements we recommend that the formula currently being used to determine the insured component of death and disablement benefits of the Plan be retained.

Minimum Requisite Benefits

The administrator has advised that reliable MRBs for the South32 category were unable to be provided for this investigation due to some information from the employer not being accurate. We suggest the MRBs be reliably calculated for the South32 DB category on a quarterly basis to monitor the potential for technical insolvency.

Furthermore, it is our understanding that the MRBs for WASF DB members are not currently coded on the administration system and the administrator has advised that a decision has been made not to do so. There is an obligation for the Trustee to ensure the actuarial investigation includes a statement regarding solvency in relation to MRBs. While it is possible for this statement to be made with the Plan DB VBI well over 100%, it would be problematic if this were not the case. We have estimated the solvency in relation to the MRBs, as measured by the MRBI, by assuming the MRBs for the WASF DB members are equal to their vested benefits. This is a conservative estimate of the MRBs for these members. The Trustee should rely on its own legal advice that this approach meets the requirements of SPS 160.

While noting the decision not to code the MRBs on the administration system was based on an assessment that they would not apply, we nonetheless recommend that the Trustee review the assessment of the MRB relative to vested benefits nearer to the time that the SG rate increases to 12%, bearing in mind the actual membership at that time.

The Trustee should also consider the risks involved in assessing technical insolvency should the VBI fall below 100%.

Shortfall Limit

The Shortfall Limit for the Plan is currently 100%. Noting the investment strategy for the Plan's DB liabilities and the current overall DB VBI, we believe this shortfall limit remains appropriate and does not need to be reviewed.

Monitoring of Financial Position

We note that the Trustee continues to monitor the financial position of the Plan on a quarterly basis (via the administrator's quarterly financial position update) in line with the reporting requirements to APRA.

Currently this is done on the basis of the combined Plan DB liabilities, though the DB VBI for the two benefit categories is also separately noted.

Section 11: Reliance Statement and Data

This report is provided subject to the terms set out herein and in our Consulting Services Agreement dated 21 June 2016. This report is provided solely for the Trustee's and Principal Employer's use and for the specific purposes indicated above. It may not be suitable for use in any other context or for any other purpose.

Except where we expressly agree in writing or where required by law, this report should not be disclosed or provided to any third party. In the absence of such consent and an express assumption of responsibility, no responsibility whatsoever is accepted by us for any consequences arising from any third party relying on this report or any advice relating to its contents.

Where the report is provided to a third party, we make no representation as to the suitability of this report for any purpose other than that for which it was originally provided and accept no responsibility or liability in this regard.

In preparing this report, we have relied upon information and data provided to us orally and in writing by the Trustee or Principal Employer and other persons or organisations designated by the Trustee. We have relied on all the data and information provided, including Plan provisions, membership data and asset information, as being complete and accurate. We have not independently verified the accuracy or completeness of the data or information provided, but we have performed limited checks for consistency.

In our opinion, all calculations are in accordance with requirements of applicable professional standards.

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DO: CH | TR: AB | ER/CR: FB

https://wtwonlineau.sharepoint.com/sites/tctclient_711021_benaussouth3222_m/documents/04.01_actl_valn/deliverables/south32 valuation_31 december 2021_final.docx

Appendix A: Summary of Benefits and Conditions

The Plan consists of a number of classes of membership (known as Parts), each of which provides different benefits.

- South32 DB category –former members of the BHP Billiton Superannuation Fund, transferred to the South32 Superannuation Plan on 1 November 2015.
- WASF DB category – former members of the Worsley Alumina Superannuation Fund, transferred to the South32 Superannuation Plan on 1 November 2016.

Under the Trust Deed, as a result of an actuarial investigation, the Trustee may change employer contributions, member contributions and/or benefits payable to members after obtaining the advice of the actuary and subject to the consent of the Employer. In addition, under the Trust Deed, the Trustee has the power to amend the Rules subject to certain constraints.

The following is a summary of the Plan benefits provided to members.

Definitions

Accrual Rate Percentage – in respect of the each year of Service in the following categories:

- 16.7% for WASF DB category, A1 Benefit Class
- 20% for South32 DB category

Accrual Retirement Multiple – the aggregate of all relevant accrual rate percentages across the Service of the Member to the date of calculation.

Early Retiring Age – age 55.

Final Average Salary (FAS) for South32 DB members – the average salary of a Member during the three years immediately preceding termination of service or attainment of Normal Retirement Age.

Final Average Salary (FAS) for WASF DB members – where a Member has completed three full years of Service with the Employer, an amount calculated by dividing by three the sum of the three highest amounts of Annualised Salary in the period commencing on the date the Member commenced employment with the Employer; or where a Member has completed less than three years of service with the Employer, an amount calculated in accordance with the following:

$$\frac{A \times 365}{B}$$

where:

A = the total of any Salary paid to the Member

B = number of days in the period in which the Member was in the Service of the Employer.

Member's Accumulated Contributions (MAC) – total contributions made by the Member, accumulated with interest, assuming all contributions are paid mid-year.

Membership Period – the time between the date the Member joined the Plan and the date the Member leaves the Plan, subject to a maximum of 36 years.

Normal Retirement Date – the sixty-fifth anniversary of the date of birth of a Member.

Normal Retirement Multiple – the aggregate of all relevant accrual rate percentages across the Service of the Member assuming the Member continues to be in Service until the sixty-fifth anniversary of the date of birth of a Member.

Salary – the remuneration for services rendered by the Member to the Employer excluding paid overtime or special or ex-gratia grants or bonuses, shift allowances and allowances of any other kind whatsoever; or in any particular case such amount as is for the purposes of the Plan agreed upon between the Member and the Employer.

South32 DB category

Contributions and Accounts

Contributions by Members

South32 DB category members of the Plan are required to contribute at 4% of Salary (excluding bonuses, overtime and allowances), subject to a maximum of $2,400 pa. If the member chooses to make the contributions as salary sacrifice (before tax), the member is to contribute 4.71% of Salary (this is to take account of the 15% contributions tax).

Members may make additional voluntary contributions ("AVCs") which accumulate with interest and are paid on leaving service for any reason.

There are no administration fees for members in this category.

Benefits

Minimum Benefit

The minimum benefit that applies on resignation and retirement is equal to the sum of:

- 2.5 x Member's Accumulated Contributions;
- 3% x Final Average Salary x years of membership from 1/3/1987;
- balance of additional voluntary accounts the member may have;

This benefit is subject to the Minimum Requisite Benefit.

Leaving Service Benefit

When the member leaves for any reason other than death or disablement the benefit is calculated as:

> 20% x Final Average Salary x Membership Period x Benefit Factor
>
> where
>
> Benefit Factor = max (0, (1 – (55 – max (40, min (55, age))) x 0.02))

plus the balance of additional voluntary accounts in the Plan.

The leaving service benefit is subject to the minimum benefit.

On leaving service after the preservation age (but before the Normal Retirement age) the member can elect to take their benefit as a pension rather than a lump sum, equal to:

> Leaving Service Benefit / Pension Discount Factor
>
> where
>
> Pension Discount Factor = 10.80 + (65 – age at retirement) x 0.3

Similarly, on leaving service at Normal Retirement Age the member can take the benefit as a pension, equal to:

> 1/54 x Final Average Salary x Membership Period x Discount Factor
>
> where
>
> Discount Factor = 10.80 / (10.80 + (65 – age at retirement) x 0.3)

The pension is fixed (that is, it is not indexed with price increases). A reversionary pension may be paid on the death of the member.

Death Benefit

A lump sum benefit equal to:

20% x Projected Final Average Salary at 65 x Potential Membership to 65

Potential Membership has a maximum of 36 years.

If the member joined the Predecessor Fund before 1/7/1994 the death benefit can be paid as part lump sum plus part pension(s) payable to the Spouse and Child Dependant(s).

The part lump sum is calculated as:

Final Average Salary x (65 – max (age at death, 45)) x 0.15

The Spouse Pension is calculated as:

Half of the member's TPD pension.

The Dependants' Pension on death is calculated as:

One sixth of the member's TPD pension, provided for up to three dependants, where dependants include children up to 18 years of age, or children up to 25 if in full-time study.

Pensions, other than those payable to children, do not increase in line with inflation or investment earnings.

Disablement Benefit

A benefit is payable on assessment of total and permanent disability equal to the benefit payable had the Member died on the date of assessment.

If the member joined BHP Billiton Superannuation Fund before 1/7/1994 the TPD benefit can be paid as part lump sum plus part pension

The part pension is calculated as:

1/54 x Final Average Salary x Total Potential Membership to 65

In addition, these members would also receive a part lump sum calculated as:

Final Average Salary x (65 – max (age at death, 45)) x 0.15

WASF DB category

Contributions and Accounts

Contributions by Members

Members in the WASF DB category, A1 benefit class are not required to make contributions. There are no remaining members in the categories formerly known as ‘B1’ and ‘C1’.

There are no administration fees for members in this category.

Benefits

Normal Retirement Benefit

When the member leaves for any reason other than death or disablement the benefit is calculated as:

> Normal Retirement Multiple x Final Average Salary
>
> plus
>
> the balance of additional voluntary accounts in the Plan.

The leaving service benefit is subject to the minimum benefit.

Resignation or Early Retirement Benefit

When the member ceases to be in the Service of the Employer before his or her Normal Retirement Age the lump sum benefit payable is calculated as:

> Accrued Retirement Multiple x Final Average Salary x Discount Factor
>
> *plus*
>
> additional accumulation benefits
>
> *Less*
>
> offset accounts (if any).

This benefit is subject to the Minimum Requisite Benefit.

Death/Total and Permanent Disablement Benefit

The lump sum benefit payable is calculated similarly to Normal Retirement Benefit except that the Member’s Annual Salary should replace the Final Average Salary in the calculation of the benefit.

The benefit above shall not be less than:

2 x the Member's Annual Salary at the date of Death or Total and Permanent Disablement

The additional accumulation benefits less offset accounts (if any) are also payable.

Additional Accumulation Benefits

The additional accumulation benefits paid to Members on all forms of exit are:

Member Voluntary Account

plus

Employer Voluntary Account

plus

Rollover Account

less

Surcharge Account

Appendix B: Summary of Actuarial Assumptions

Financial Assumptions

Assumption	South32 DB	WASF DB
Investment Return - Net	3.90% p.a.	2.10% p.a.
Investment Return - Gross	4.50% p.a.	n/a
Salary Increases	2.50% p.a.	2.50% p.a.

Demographic Assumptions

Assumption	
Pensioner Mortality	
Normal Health Pensioners	ALT 2015-17 with 1.0% pa improvements from 1 July 2016
Pensioner Life Expectancies	
Normal Health - Male 65	21.6 years
Normal Health - Female 65	24.3 years
Disability - Male 65	12.7 years
Disability - Female 65	17.3 years
Proportion Married	90%
Spouse Age Difference	
Active Members	Husbands 3 years older
Pensioner Members	Actual difference if spouse date of birth known else +/- 3 years
Pension Take-Up	33% of eligible retirees (from preservation age) take their benefit as a pension. WASF DB members are not eligible to take a pension.

Sample Decrement Rates

Specimen annual rates of decrement appear in the tables below.

Age	Number out of 10,000 members aged X at the beginning of the year assumed to leave the Plan during the year on account of:		
	Death	Disablement	Resignation
25	5	3	1000
30	5	3	1000
35	5	3	1000
40	8	7	1000
45	11	16	1000
50	16	38	1000
55	25	85	-

Age	Number out of 10,000 members aged X at the beginning of the year assumed to retire during the year
55	1,000
56	1,000
57	1,500
58	2,000
59	2,500
60	3,000
61	3,500
62	4,000
63	4,500
64	5,000
65	10,000

Age	Number out of 10,000 pensioners aged X at the beginning of the year assumed to die during the year	
	Males	Females
55	43	26
60	65	37
65	97	57
70	155	96
75	263	168
80	469	316
85	868	628
90	1,519	1,221
95	2,242	2,042

Expenses

Expenses of investment management are allowed for within the assumed net rates of investment return.

Annual administration, actuarial, audit and other expenses have been allowed for at the rate of 0.25% of DBD assets. The cost of insurance has been allowed for at the rate of 0.90% of the DBD members' salaries.

We have also made an allowance for administering future lifetime pensioners by grossing up the value of the current lifetime pension liability by 1%.

Taxation

It has been assumed that the current rates of taxation applying to the Plan will remain unchanged and that the Plan will remain a complying fund and therefore be entitled to concessional tax treatment.

Accordingly, future employer contributions have been assumed to be taxed at 15%.

Member Contributions

Member contributions for South32 DB members are currently capped at $2,400 pa (the contribution for a member with a salary of $60,000 or more). For the purpose of this investigation, we have assumed that the maximum member contribution will not be varied in the future.

Appendix C: Statements required under Regulation 23 of SPS 160

South32 Superannuation Plan (the Plan)

The statements required under paragraphs 23(a) to (h) of SPS 160 for regular investigations are set out below. Note that these are provided in relation to the Plan's combined DB liabilities and not for the South32 DB and WASF DB categories separately.

(a) Plan Assets

At 31 December 2021, the value of the assets of the Defined Benefit members of the Plan was $39.284 million. This amount excludes any Operational Risk Financial Requirement, which is held separately to the Defined Benefit reserve by the MLC Super Fund.

(b) Projection of Vested Benefits

The projected likely future financial position of the defined benefit categories of the Plan during the three years following the investigation date and based on my best estimate assumptions is as follows.

Date	Assets ($m)	Vested Benefits ($m)	Vested Benefits Index (%)
31 December 2021	39.3	32.6	120.6%
31 December 2022	31.3	27.2	115.1%
31 December 2023	28.3	24.5	115.6%
31 December 2024	25.6	22.1	116.0%

(c) Accrued Benefits

In my opinion, the value of the assets of the defined benefit members of the Plan at 31 December 2021 was adequate to meet the liabilities in respect of the accrued benefits of defined benefit members of the Plan (measured as the value of members' accrued entitlements using the valuation assumptions). We consider that the assumptions and valuation methods set out in this report are appropriate for determining the accrued benefit liability.

(d) Vested Benefits

At 31 December 2021 the Plan was in a satisfactory financial position, as defined in SPS 160. In my opinion the Plan does not need to be treated as being in an unsatisfactory financial position. The shortfall limit does not need to be reviewed.

(e) Minimum Benefits

At 31 December 2021 the value of the minimum benefits of the defined benefit members of the Plan were less than the defined benefit assets as at that date. Minimum benefits are as defined in Regulation 5.04 of the Superannuation Industry (Supervision) Regulations.

Noting that the MRBs for:

- Active South32 DB members were estimated to be equal to 80% of their vested benefits;
- South32 DB pensioners, were the estimated value of their pension entitlements; and
- WASF DB members were estimated (conservatively) to be equal to their vested benefits.

The coverage of the MRBs for all DB members of the Plan on this basis as at 31 December 2021 was 132.7%.

(f) Funding and Solvency Certificates

Funding and Solvency Certificates for the Plan covering the period from 1 January 2018 to 31 December 2021 have been obtained. The Plan was solvent, as defined in the Superannuation Industry (Supervision) Regulations, at 31 December 2021. In my opinion, the solvency of the Plan will be able to be certified in any other Funding and Solvency Certificate required under the Regulations during the three year period to 31 December 2024.

(g) Employer Contributions

As a result of my investigation, we recommend that:

- the employer contribute at the current rate of 31.6% for the GEMCO employee in the South32 DB category until 30 June 2022;
- the employer contribution rate in respect of the GEMCO employee be nil from 1 July 2022; and
- the employer contribution rate in respect of South32 DB members (excluding the GEMCO employee) and the WASF DB category members be nil from 1 January 2022.

In addition we recommend that salary sacrifice member contributions for DB members, OTE top-up contributions for WASF DB members and contributions in respect of Accumulation members continue to be paid as recommended in the previous actuarial investigations of the Plan and the WASF.

We also recommend the Company consider regular asset transfers of $500,000 p.a. from WASF DB assets to South32 DB assets to occur from 30 June 2022 until 31 December 2024.

We also recommend that the Trustee consider the risks associated with assessing technical insolvency should the VBI fall below 100%. Subject to any legal advice, at a minimum they should also review the assessment of the MRB relative to vested benefits nearer to the time the SG increases to 12%, based on the actual membership at that time.

(h) Defined Benefit Pensioners

In my opinion, as at 31 December 2021, there is a high degree of probability that the Plan will be able to pay the pensions as required in the governing rules.

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