

# Ore Reserve (and Saleable Product) and Mineral Resource Report 2022

(Remaining after 31 December 2022)



This report details the latest Ore Reserve (and Saleable Product) and Mineral Resource estimate updates of Kumba Iron Ore Limited as at 31 December 2022, reconciled against 2021 estimates.

Appointed Competent Persons have aimed to set out the estimates in a transparent and material manner to conform to the South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves SAMREC Code (2016 Edition) as well as Section 12.13 of the Johannesburg Stock Exchange Listing Requirements.



# Kumba's Ore Reserve replenishment (as part of its Tswelelopele strategy - 2018 to 2022)

## 2017

In 2017 Kumba Iron Ore adopted its Tswelelopele strategy to:

- operate our assets to their full potential (Horizon 1: one to three years)
- leverage our endowment in the medium term (Horizon 2: three to five years)
- optimise competencies and assets to sustain and expand the business (Horizon 3: five to seven years)

To unlock Kumba's full potential and achieve disciplined growth for a sustainable future, Kumba adopted an Ore Reserve and Mineral Resource theme in 2018, which is aligned with Horizons 1 and 2 of the Tswelelopele strategy.

The target was to convert an additional 385 Mt of Mineral Resources to Ore Reserves by 2022, which equates to an Ore Reserve replenishment target of 200 Mt (30% of Ore Reserve portfolio in 2017) before depletion.

The life-of-asset (LoA) at the commencement of Tswelelopele was 2032.

## 2018

In 2018, Kumba replenished its Ore Reserve portfolio by 112.1 Mt (before depletion), primarily as a result of pit slope optimisation (phase 1 of a geotechnical study) as well as the adoption of world-class benchmark efficiencies into the Sishen life-of-asset plan (LoAP). The Sishen reserve life was increased from 13 to 14 years.

This subsequently translated into a 20% increase in the value of the Sishen operation. At that stage the target was to convert an additional 390 Mt of Mineral Resources to Ore Reserves by 2022.

## 2019

This year could be considered a hiatus period where the Ore Reserve replenishment of 12.8 Mt, primarily as a result of improved Resource to Reserve conversion, did not succeed in outperforming the annual Ore Reserve depletion.

Pit optimisation at Kolomela did, however, result in a significant decrease in the waste to ore stripping ratio from 4.1 : 1 to 3.8 : 1.

## 2020

A total Ore Reserve replenishment of 81.5 Mt (before depletion) was achieved in 2020. As a result, the Sishen reserve life increased from 13 to 15 years.

The year-on-year increase in Ore Reserves reflected the benefit of an improved long-term economic outlook, as well as optimised haul road designs, combined with yet another year of advances made as a result of a continuation of the geotechnical study at Sishen.

In 2020, Kumba achieved the 200 Mt (before depletion) Ore Reserve replenishment target set in 2018, two years ahead of schedule.

Kumba continued with exploration to gauge the potential of near-mine exploration targets identified through its 3D regional geological genetic model of the Northern Cape province iron ore belt and gained access to two prospective targets through a joint venture partnership.

## 2021

At the end of 2021, a cumulative (2018 to 2021) Ore Reserve replenishment of 322.8 Mt (before depletion) was achieved against a target of 200 Mt set at the commencement of Tswelelopele.

The feasibility study of the Sishen ultra-high dense media separation (UHDMS) project (conversion of dense media separation plant into a UHDMS) was approved in Q1 2021, contributing a further 135.3 Mt low-grade Ore Reserves to the Sishen portfolio. The Sishen life-of-asset (LoA) was extended from 15 to 18 years (2039) with the inclusion of the UHDMS project although from 2035 to 2039 annual production will be in the order of 10 to 15 Mt.

The Kapstevél South pit at Kolomela was increased, adding an additional 12.9 Mt Ore Reserves, extending the LoA from 2032 to 2034.

Near-mine exploration between the two Northern Cape operations continued.

## 2022

With the conclusion of the Tswelelopele strategy in 2022, Kumba has achieved a cumulative five-year Ore Reserve replenishment of 332.3 Mt (before depletion), against a target of 200 Mt set at the end of 2017.

The net result (after depletion) is an increase in Ore Reserves of 83.0 Mt, with an associated decrease in Saleable Product of 6.4 Mt from 31 December 2017 to 31 December 2022.

The decrease in Saleable Product is due to the fact that the majority of the additional Ore Reserves were lower grade and therefore lower yield.

Saleable Product  
2022

532.2 Mt

2017

538.6 Mt

Ore Reserves  
2022

759.4 Mt

2017

676.4 Mt

# 2022 Ore Reserve (and Saleable Product) and Mineral Resource Report

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Kumba Iron Ore (KIO), a business unit of Anglo American plc (its majority shareholder), is a single commodity iron ore minerals company listed on the Johannesburg Stock Exchange (JSE) in the Republic of South Africa (market cap – US\$9.4 billion at 31 December 2022), focusing its business on competing in the global iron ore market through premium product delivery.

### Ore Reserve (and Saleable Product) and Mineral Resource (ORMR) report

Reported in accordance with the South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (SAMREC Code – 2016 Edition) as required by section 12.13 of the JSE Listings Requirements.

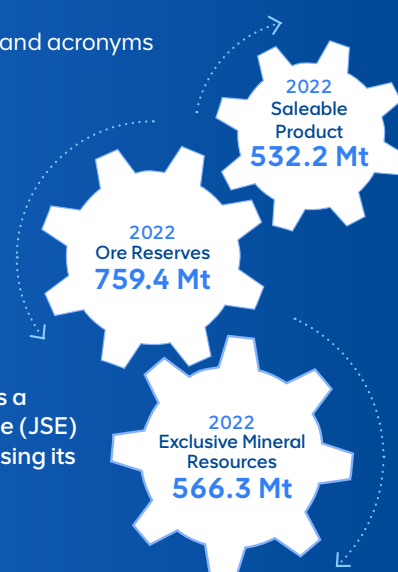
The updated Ore Reserve and Mineral Resource estimates and associated ancillary information contained in the ORMR report are based on input from site-specific Resource and Reserve (R&R) Statements, which are compiled before year end to allow for peer reviews by KIO and Anglo American before estimates are published. Information such as annual production, etc. (which is forecasted) may therefore differ from those quoted in the Kumba Integrated report, the latter compiled after calendar year end and reflecting actual figures. Adjustments to Mineral Resource, Ore Reserve and Saleable Product estimates are made in the following year to correct any differences between actual and forecasted estimates used in the previous reporting period.

Kumba values any feedback regarding the competency, materiality and transparency with which its Ore Reserves (and Saleable Product) and Mineral Resources have been presented in this report.

Feedback ([jean.britz@angloamerican.com](mailto:jean.britz@angloamerican.com))

For more information see [www.angloamericankumba.com](http://www.angloamericankumba.com)

An abridged version of the 2022 ORMR report is chaptered within the 2022 Kumba Integrated report. (<https://www.angloamericankumba.com/investors/annual-reporting/reports-archive/2022>)



### Navigating our other 2022 reports

Our integrated reporting suite comprises the following reports in addition to the ORMR report:

#### Integrated report\*

A succinct review of our strategy and business model, operating context, governance and operational performance, targeted primarily at current and prospective investors.

#### Annual financial statements

Detailed analysis of our financial results, with audited financial statements, prepared in accordance with International Financial Reporting Standards (IFRS).

#### Sustainability report\*

Reviews our approach to managing our significant environmental, social and governance (ESG) impacts, and addressing those sustainability issues of interest to a broad range of stakeholders.

### Climate change report\*

Provides a balanced and appropriate presentation of our climate-related impacts, risks and opportunities and our response to managing these risks and mitigating our climate change impacts.

The reporting process for all our reports has been guided by the principles and requirements contained in IFRS, the Value Reporting Foundation's Integrated Reporting Framework, the GRI Standards, the JSE's Sustainability Disclosure Guidance (issued in June 2022), the King Code on Corporate Governance for South Africa 2016 (King IV™\*\*), the JSE Listings Requirements, and the Companies Act No 71 of 2008, as amended (Companies Act).



\* Each of these reports, with additional updated information will be available on our website from 14 April 2023.

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# Introduction

Kumba's business is structured around its two open-pit mines in the Northern Cape province of the Republic of South Africa, where it mines and beneficiates iron ore for the global iron ore market in a safe and sustainable manner, adding value to its investors, while developing its workforce and creating opportunities for its host communities:

- Kolomela is a predominantly direct shipping ore (DSO) operation with a crushing and screening plant treating high-grade ( $\text{Fe} \geq 61\%$ ) run-of-mine, and a small-scale UHDMS facility treating medium-grade ( $50\% \leq \text{Fe} < 61\%$ ) run-of-mine.
- Sishen mine beneficiates its run-of-mine through large-scale beneficiation facilities, utilising dense media separation (DMS) and Jigging technologies (with a portion of the Jig plant discard being treated via two small-scale UHDMS modules).

A range of high-grade Lump and Fine iron ore products are produced at the operations and railed to the Saldanha harbour on the west coast of South Africa from where it is shipped to fulfil Client off-take. The products are globally marketed as three Kumba blend products:

Premium Lump:  $\geq 65.2\% \text{ Fe}$

Standard Lump:  $63.6\% \text{ Fe to } 64.1\% \text{ Fe}$

Standard Fines:  $62.4\% \text{ Fe to } 63.7\% \text{ Fe}$

Both the Kolomela and Sishen mines are conventional drill and blast and truck and shovel open-pit operations with ex-pit ore at Kolomela hauled to designated finger stockpiles from which a run-of-mine blend is delivered, while at Sishen the run-of-mine originates directly from the pit as well as from designated buffer stockpiles. The Kolomela finger stockpiling is necessary to produce the correct run-of-mine blend for the predominantly DSO operation, while at Sishen the run-of-mine buffer stockpiling facilitates plant feed consistency through partial blending with ex-pit ore.



Thickener dams at Sishen's Jig plant

Kumba's ability to generate value is dependent on access to financial capital, its skilled employees, quality internal and external relationships and natural mineral endowment, supported by the right company culture as well as access to necessary outbound infrastructure. This report focuses on the *in situ* iron ore Mineral Resources and derived modified Ore Reserves for which Kumba has obtained the right to mine, and beneficiate to Saleable Product. Consistent Saleable Product delivery over time can only be achieved through disciplined mining and diligent planning. This report is the outcome of Kumba's long-term planning cycle, a process of defining the Mineral Resources via exploration and subsequent spatial modelling, designing safe and economical pit layouts and compiling production schedules to extract the iron ore considering available mining infrastructure and converting it into Saleable Product considering available beneficiation and logistical infrastructure.





Liebherr 996 shovel at Kolomela mine

Kumba's exploration programme retained its focus on on-mine exploration, with the dual aim of improving confidence in the spatial definition of its Mineral Resources inside and outside current LoAPs and generating spatial geometallurgical information to optimise value and safeguard niche products. Exploration focus outside of the mining right areas has been to understand the full endowment potential of the area through the development of a regional genetic model used to identify targets for potential development. As an example, Kumba has entered into a JV agreement with a prospecting right holder who has been able to submit a mining right application for a small high-value deposit to the south of Sishen.



Hands-free drill rod handling on drill rig operated by Rossond (contracted by Kumba Iron Ore)

# The statement

Kumba Iron Ore Limited is a JSE-listed minerals company that focuses its business (iron ore exploration, mining, beneficiation and marketing) in the Northern Cape province of the Republic of South Africa. It proudly operates two open-pit mines, namely Kolomela and Sishen. Both operations have established infrastructure, which is applied to convert *in situ* haematite mineralisation into saleable iron ore product, of which a portion earns the company a premium in the global iron ore market. Current production output is mostly railed across a rail line linking the mining operations with the commodity export harbour facility at Saldanha Bay on the west coast of South Africa, from where it is shipped to the various global Client destinations.

## Reporting code

The 2022 Kumba online Ore Reserve (and Saleable Product) and Mineral Resource (ORMR) report is derived from a comprehensive amount of information compiled in the form of site-specific R&R Statements; which is structured to address all aspects listed in the Checklist of reporting and Assessment Criteria Table of the SAMREC Code (2016 Edition).

The Kumba ORMR report aims to meet the JSE Listings Requirements as per section 12.13 for minerals companies, referencing reporting requirements as set out in "The South African Code for the reporting of Exploration Results, Mineral Resources and Mineral Reserves (SAMREC Code – 2016 Edition)".

Adherence is governed in the Company's business processes via a Mineral Resource and Ore Reserve reporting policy (<https://www.angloamericankumba.com/~media/Files/A/Anglo-American-Group/Kumba/sustainability/approach-and-policies/kumba-mineral-resource-and-ore-reserve-reporting-policy.pdf>).

The policy is supported by a detailed reporting requirements document and associated reporting templates, which channel the reporting requirements down to a site-specific level to ensure that Kumba meets the relevant JSE Listings Requirements.

The extent of the content in this report demonstrates Kumba's commitment to the material, transparent and competent reporting of its Ore Reserves and Mineral Resources.

## Reporting basis

The Ore Reserve (and Saleable Product) and exclusive Mineral Resource estimates are stated on a 100% basis, irrespective of attributable shareholding. Kumba's attributable ownership in operations and projects is, however, stipulated per site in the Ore Reserve (and Saleable Product) and Mineral Resource tables as listed in this statement.

The Ore Reserves and exclusive Mineral Resources is not an inventory of all mineral occurrences identified, but is an estimate of those, which under assumed and justifiable technical, environmental, legal and social conditions, may be economically extractable at current – Ore Reserves, and has reasonable prospects for eventual economic extraction (RPEEE) – Mineral Resources.

The term "Ore Reserves" in the context of this report has the same meaning as "Mineral Reserves", as defined by the SAMREC Code. In the case of Kumba, the term "Ore Reserves" is preferred because it emphasises the difference between these and Mineral Resources.

## Effective date

This report states Kumba's Ore Reserves (and Saleable Product) and Mineral Resources as remaining at 31 December 2022 and compares it with the R&R figures published for 2021.

## Ore Reserve: assumed mineable under foreseen long-term economic conditions

A long-term iron ore price forecast (based on the Platts 62% index) and exchange rate, adjusted with Kumba-specific forecasts of Lump and Fe premiums, deleterious element penalties where applicable and freight tariffs, form the basis of Ore Reserves presented in this document. This is applied to site-specific mining block models, in combination with a forward extrapolation of current site-specific budgeted cost figures, to derive a set of pit shells for each site during the annual pit optimisation process. An optimal pit shell (at a revenue factor of 1) is chosen for each site and converted into a pit layout, which spatially envelopes the currently economically mineable Ore Reserves.

The Ore Reserves are derived from the *in situ* Measured and Indicated portion of the Mineral Resource occurring within the approved pit layouts, modified into run-of-mine to account for site-specific mining efficiencies and other design, technical, environmental, legal and social aspects. The resultant Proved and Probable Ore Reserves are further modified into Saleable Product, considering site-specific beneficiation capacity and efficiencies concerning specific ore types planned for beneficiation.

Site-specific cut-off grades are assigned in run-of-mine schedules to achieve a sustainable delivery of Saleable Product that complies with Client product specifications\*.

\* Although site-specific cut-off grades are assigned in run-of-mine schedules to achieve a sustainable delivery of Saleable Product that complies with Client product specifications, the Kolomela 2022 LoAP does contain periods where the Saleable Product contaminant grades (in particular Fe, SiO<sub>2</sub> and K<sub>2</sub>O) exceed the current Client product specifications. Further work is ongoing to evaluate the potential of blending Kolomela and Sishen Saleable Product to address the foreseen Saleable Product grade deviations.



### Mineral Resource: assumed to have RPEEE

Mineral Resources are declared exclusive of (in addition to) Ore Reserves. Apart from cut-off grades, which consider the current or at least concept study approved beneficiation processes, Kumba spatially distinguishes Mineral Resources from other mineral occurrences by applying a resource shell (1.6 x revenue factor "optimistic" shell). This is derived during the annual pit optimisation process conducted on the latest site-specific 3D mining block models, considering selective mining unit (SMU) sizes (dilution and mining loss). The resource shell is then subsequently applied to the geological block models, defining the classified ore occurring inside the resource shell (and outside the pit layout) as the resultant exclusive Mineral Resource portion considered to have RPEEE.

A further condition is that the iron ore price corresponding with a 1.6 revenue factor pit shell must have been historically achieved in the global iron ore market. This process, therefore, considers site-specific beneficiation, mining practices as well as realistic pricing and cost.

Inferred Mineral Resources inside pit layouts considered in LoAPs are separately indicated in the exclusive Mineral Resource Statement, with the extrapolated Inferred portion thereof quoted in the footnotes of the exclusive Mineral Resource Statement.

### Security of tenure

All of the Ore Reserves and Mineral Resources as stated occur within mining rights granted by the South African Department of Mineral Resources and Energy (DMRE), which have been notarially executed and registered at the Mining Titles Office of the DMRE by Sishen Iron Ore Company Proprietary Limited (SIOC) (75.4% owned by Kumba Iron Ore Limited) and have not expired at the time of reporting. In the case of the Ore Reserves, the associated reserve life does not exceed the expiry date of the applicable right.



Liebherr and Komatsu loading equipment tramming in Klipbankfontein pit at Kolomela mine

### Reserve and Resource figures are not exact.

The Kumba R&R figures are derived from spatial interpretation and subsequent estimation processes, informed by technical and economical forward looking assumptions, which may not materialise as expected. By their nature, the R&R figures quoted in this report are therefore inherently subject to some level of risk and uncertainty, and may be influenced by unforeseen future events that could cause actual figures to differ from estimated figures.

# Salient features

## Key takeaways for 2022

### Ore Reserve replenishment

Kumba concluded its Ore Reserve replenishment drive in support of the Company's Tswelopele strategy in 2022 with a cumulative gain of 332.3 Mt (before depletion), against a target of 200 Mt set at the end of 2017.

The net result after depletion is an increase in Ore Reserves of 83.0 Mt over a five-year period, with an associated decrease in Saleable Product of 6.4 Mt. The majority of the Ore Reserve replenishment in the past five years involved the addition of low-grade ore associated with the introduction of new beneficiation technology (UHDMS), which enables Kumba to convert these low-grade Ore Reserves to Saleable Product, but at lower yields. As a result, there is a net 12% increase in Ore Reserves with a 1% decrease in Saleable Product from 2017 to 2022.

The following projects and initiatives have been completed over the period:

- 2018 – The implementation of the modular UHDMS plants at Sishen mine to beneficiate the Jig plant discard
- 2019 – Sishen pit slope optimisation phase 1
- 2019 – Kolomela waste stripping optimisation
- 2020 – Sishen pit slope optimisation phase 2
- 2021 – Sishen UHDMS project approval – 2024 implementation date under review
- 2022 – Conversion of Kolomela medium-grade material to Ore Reserves for beneficiation via the modular UHDMS plant

### Exploration

On the exploration front, SIOC has continued its exploration activities in the Northern Cape province, including drilling on near-mine properties that have been identified as potential iron ore mineralisation targets as per Kumba's regional geological model. Access for exploration has been achieved through option agreements with current third-party mineral right holders. If the properties are prospective and meet Kumba's expected criteria, Kumba has the right to take up 70% of the ownership in the assets.

Through exploration drilling and sample analyses and geometallurgical test work, Kumba has advanced one such opportunity (small deposit located south of Sishen mine) to a confidence level where our JV partner could submit a mining right application, which is currently under consideration by the DMRE.

## Reserve and Resource movements from 2021 to 2022

### Saleable Product

Decreased over the reserve life by 6% (-33.3 Mt) year-on-year, primarily as a result of production at both operations and less Ore Reserves available for processing at Kolomela mine due to a decrease in the size of the Kapstevél South pit layout.

### Ore Reserves

Showed a net year-on-year decrease of 5% (-40.5 Mt), mainly attributable to production at Kolomela and Sishen and the reallocation of the pushback 5 portion of Kolomela mine's Kapstevél South pit Ore Reserves to Mineral Resources (decrease in size of pit layout) to align with the 2022 pit optimisation outcome considering changes in cost and long-term economic price assumptions as at March 2022.

### Mineral Resources (in addition to Ore Reserves)

Realised a minor increase of 0.5 Mt from 2021 to 2022, mainly as a result of the reallocation of the Kolomela mine Kapstevél South pit Ore Reserves to Mineral Resources; partially off-set by the conversion of Kolomela mine's medium-grade material (high-grade ore diluted with ferruginised banded iron formation (BIF)) to Ore Reserves, supported by the demonstration of the trial beneficiation thereof via the modular UHDMS plant.

## Other

### Governance

An independent external due diligence audit of the 2021 Kolomela Mineral Resource and Ore Reserve estimation and reporting, as part of the Kumba three-year external R&R audit cycle, revealed no Priority 1 (high or significant risk) findings pertaining to the estimation processes and subsequent reporting.

### Mine planning

Kumba has developed in-house capabilities in its LoA and business planning environment to better inform strategic decisions and quantify risks via valuated scenario planning.



## Risks

The following two high Ore Reserve risks should be noted:

### Financial

A substantial increase in operational costs, because of:

- the moderation of equipment efficiency planning assumptions (to align planning with the last three years' demonstrated performance)
- significant increase in costs (inflation and structural cost increases)
- moderation of the Transnet (rail) logistics assumptions which have seen the LoAP valuations (NPV at 8% real) decrease for both the Kumba mining operations.

*Mitigation: The 2023 pit optimisation exercises for both operations will consider the increase in mining cost. A project has been launched to review the optimal production, cost, and organisational structure to ensure the continued profitability of the business at acceptable margins while still delivering on the Company's strategic objectives.*

### Project

At Sishen, the UHDMS project involves the conversion of the existing Sishen DMS plant to a UHDMS plant. During Q4, significant engineering complexity emerged relating to the design and construction of an operational plant.

*Mitigation: Kumba is currently undertaking a full review of the project including a potentially lower complexity option. Several capital and timing sensitivities have been run, which show that the project remains robust from an economic perspective. As a result of the review, a decision was made not to update the 2022 Sishen LoAP and associated Ore Reserve declaration with the full benefit of UHDMS until the current challenges are resolved and reviewed. The 2022 Sishen Ore Reserve estimate is therefore based on the 2021 LoAP with this year's depletion taken into account.*



Fine ore being reclaimed from product bed at Kolomela mine to rail to Saldanha Bay port

# High-level overview of Kumba's Saleable Product, Ore Reserves and Mineral Resources

These are the foundations on which our business is based and continuously developed.

## Saleable Product

Kumba processes or beneficiates its run-of-mine at its mining operations through crushing and screening, and various DMS processes as well as jigging to produce on-site products that are combined into final premium Lump, standard Lump and standard Fines iron ore products for Client off-take.

Remaining Saleable Product estimates are determined through the application of fundamental and empirically derived beneficiation algorithms to the scheduled Ore Reserves (and reported excluding estimated modified beneficiated Inferred Mineral Resources) to convert the applicable run-of-mine tonnage and grade estimates into product tonnage and grade estimates. The fundamental beneficiation algorithms are derived from geometallurgical beneficiation test work in the case of Sishen mine, while the empirical beneficiation algorithms are derived from historical performances as measured for Kolomela. The beneficiation algorithms consider the various site-specific run-of-mine ore types, site-specific beneficiation capacities and site-specific beneficiation efficiencies.

The Saleable Product tonnages are summarised in **Figure 1** per site and per confidence class.

It is important to note that the Saleable Product figures are not in addition to the Ore Reserve figures, i.e. the Ore Reserve figures are inclusive of the Saleable Product.

## Saleable Product summary

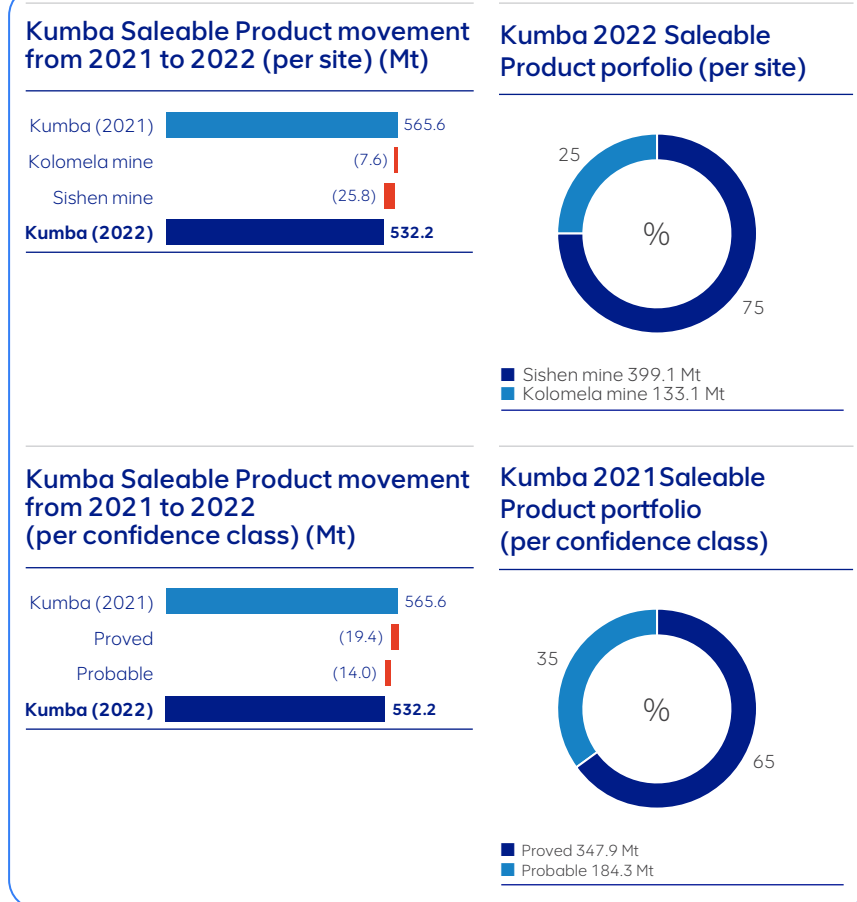
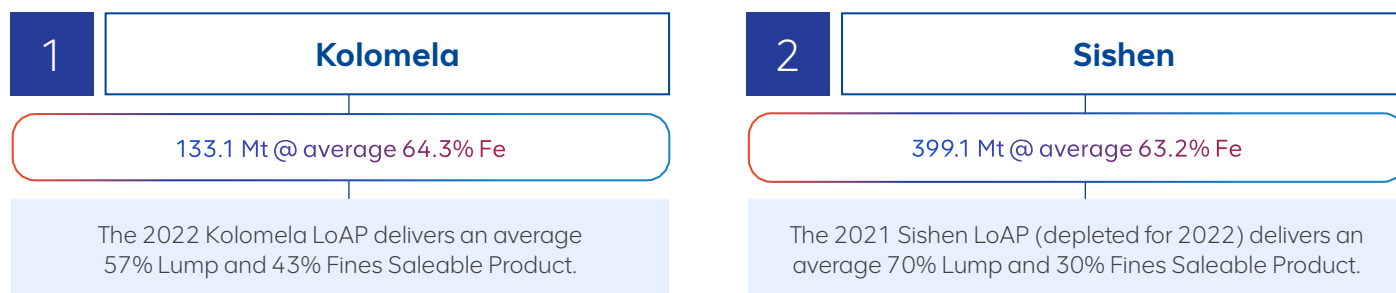


Figure 1: Kumba 2022 (versus 2021) Saleable Product summary



As at 31 December 2022, Kumba plans to produce an estimated 532.2 Mt of Saleable Product (excluding estimated modified beneficiated Inferred Mineral Resources) at an estimated average beneficiated grade of 63.5% Fe from its two mining operations over its remaining reserve life:



The overall average Lump-to-Fine ratio of the Kumba Saleable Product is estimated at 67:33.

The Sishen products are co-located with the Kolomela products at the Saldanha export harbour and are marketed as the following Saleable Products under the Kumba brand:

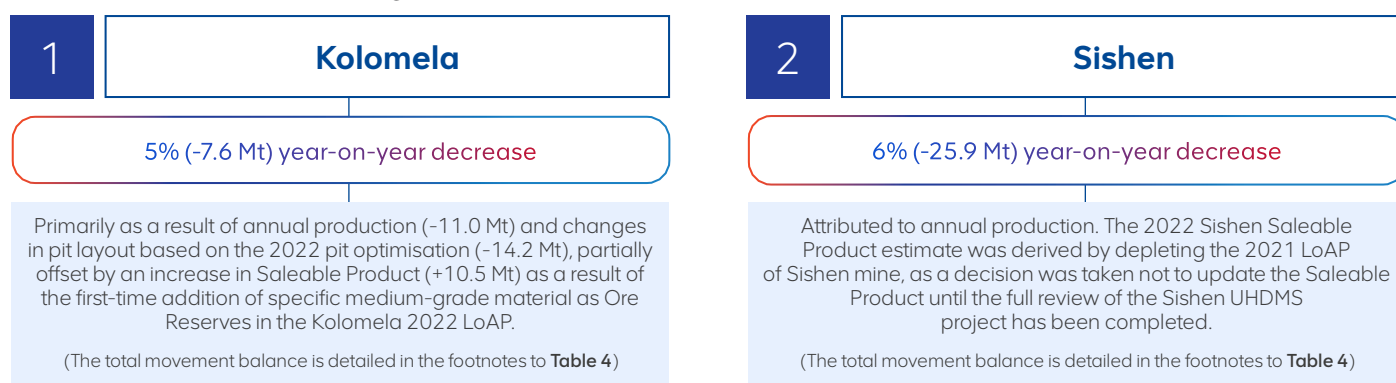
Premium Lump: ≥65.2% Fe

Standard Lump: 63.6% Fe to 64.1% Fe

Standard Fines: 62.4% Fe to 63.7% Fe

### Year-on-year movement

A 6% overall decrease of 33.3 Mt is noted for the Kumba Saleable Product compared to 2021. The average Fe content of the Saleable Product remained unchanged at 63.5%.



### Kumba Saleable Product profile

The Kumba combined (Sishen and Kolomela) planned Saleable Product profile (including estimated modified beneficiated Inferred ore) is indicated in **Figure 2**. The material reduction in production from 2035 onwards is the result of the depletion of high- and medium-grade Ore Reserves, with only standard Lump and standard Fine ore planned to be produced from low-grade run-of-mine at Sishen in the last five years.

Kumba Iron Ore combined 2022 (versus 2021) LoAP Saleable Product profile (per operation)

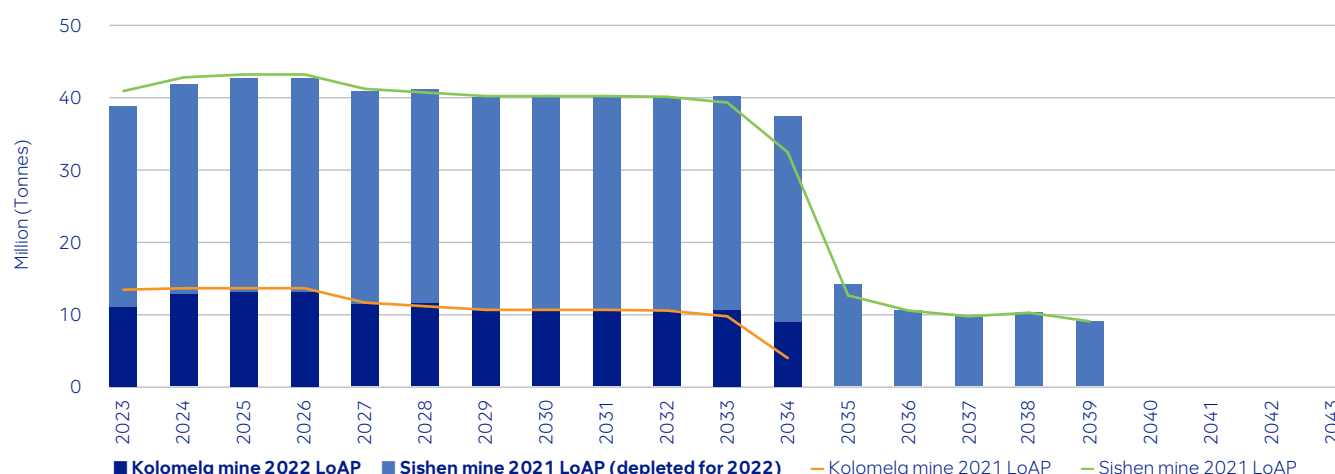


Figure 2: Kumba combined Saleable Product profile (including estimated modified beneficiated Inferred Mineral Resources)

# High-level overview of Kumba's Saleable Product, Ore Reserves and Mineral Resources cont.

## Ore Reserves

Kumba's Ore Reserves are the economically mineable and beneficiable portion of its modified (for practical and safe mining) Measured and Indicated Mineral Resources, making use of existing and foreseen (approved feasibility study) infrastructure and technology. It includes diluting materials and allowances for losses, which occur when the material is mined, and is defined as economically extractable as per Kumba's Q1 2022 view of economic parameters in terms of long-term pricing and exchange rate, with cost assumptions based on 2022 budget information.

The Ore Reserve tonnages are summarised in **Figure 3** per site and per confidence class.

### Ore Reserve summary

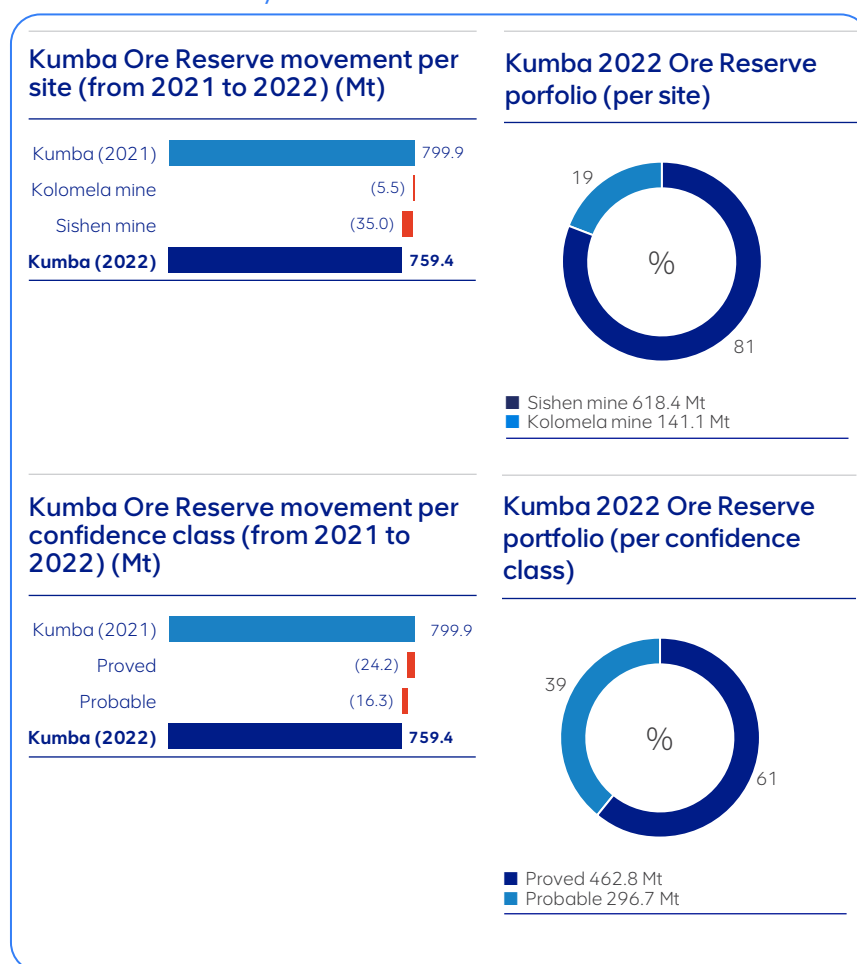


Figure 3: Kumba 2022 (versus 2021) Ore Reserve summary



As of 31 December 2022, KIO, from a 100% ownership reporting perspective, has access to an estimated haematite Ore Reserve of 759.4 Mt at an estimated average unbeneficiated or feed grade of 55.7% Fe from its two mining operations:

|   |  |   |  |
|---|--|---|--|
| 1 | <b>Kolomela</b>                                      | 2 | <b>Sishen</b>  |
|   | 141.1 Mt @ 63.3% Fe against a 50.0% Fe cut-off grade |   | 618.4 Mt @ 54.0% Fe against a 40.0% Fe cut-off grade |

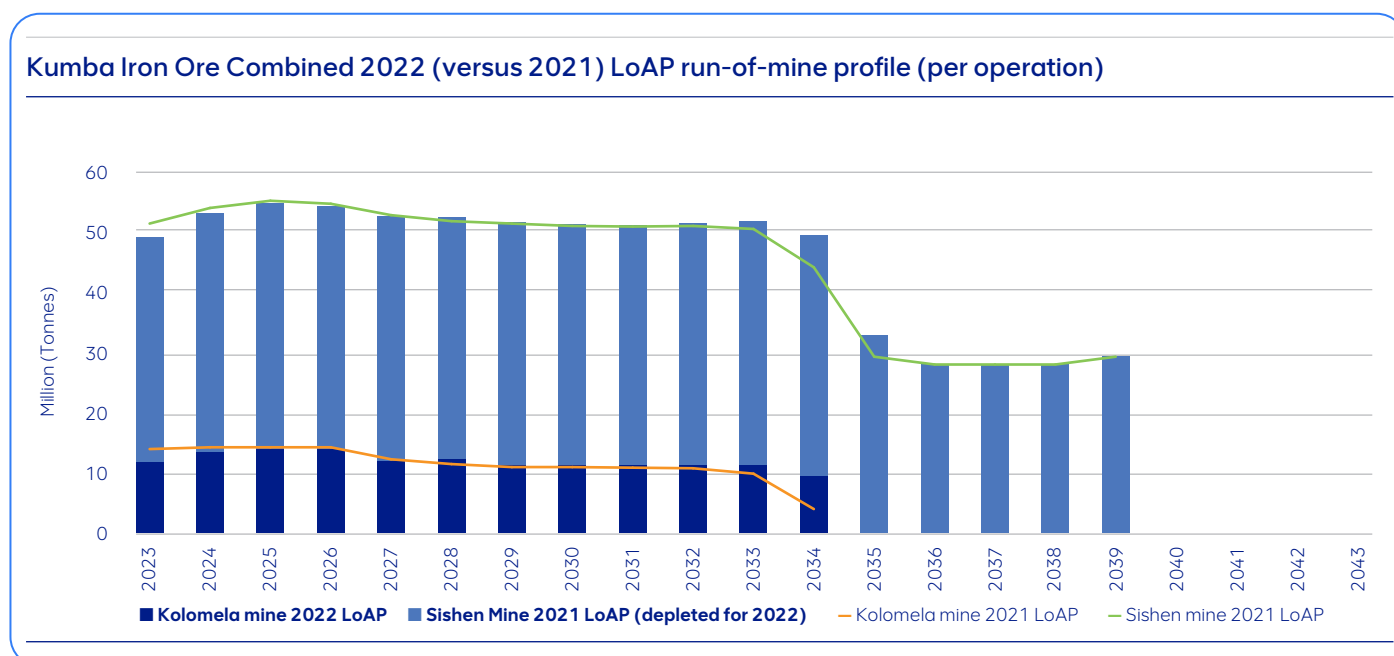
#### Year-on-year movement

A 5% net decrease of 40.5 Mt is noted for the overall Kumba Ore Reserves compared to 2021. The average Fe content of the Ore Reserves decreased from 55.8% in 2021 to 55.7% in 2022.

|   |  |   |   |
|---|--|---|---|
| 1 | <b>Kolomela</b>  | 2 | <b>Sishen</b>   |
|   | 4% (-5.5 Mt) year-on-year decrease   |   | 5% (-35.0 Mt) year-on-year decrease   |
|   | <p>Primarily as a result of annual run-of-mine depletion (~11.5 Mt) and changes in pit layout based on the 2022 pit optimisation (~15.0 Mt), partially offset by an increase in Ore Reserves (+13.5 Mt) as a result of the first-time addition of medium-grade (high-grade ore diluted with ferruginised BIF) material as Ore Reserves in the Kolomela 2022 LoAP.</p> <p>(The total movement balance is detailed in footnotes to <b>Table 5</b>)</p> |   | <p>Attributed to annual run-of-mine depletion. The 2022 Sishen Ore Reserve estimate was derived by depleting the 2021 LoAP of Sishen mine, as a decision was taken not to update the Ore Reserves until the full review of the Sishen UHDS project has been completed.</p> <p>(The total movement balance is detailed in footnotes to <b>Table 5</b>)</p> |

#### Kumba run-of-mine profile

The Kumba combined (Sishen and Kolomela) planned run-of-mine profile (including estimated modified Inferred Mineral Resources) is indicated in **Figure 4**. The reserve life has decreased from a combined 18 years in 2021 to 17 years in 2022. The material reduction in run-of-mine from 2035 onwards is the result of the depletion of high- and medium-grade run-of-mine, with only low-grade run-of-mine scheduled as plant feed at Sishen mine in the last five years.



**Figure 4:** Kumba combined run-of-mine profile (including estimated modified Inferred Mineral Resources)

# High-level overview of Kumba's Saleable Product, Ore Reserves and Mineral Resources cont.

## Mineral Resources

Kumba's exclusive Mineral Resources are the *in situ* iron ore of which the form, grade and quantity are spatially defined within the revenue factor 1.6 resource shells, excluding the Measured and Indicated Mineral Resources occurring inside pit layouts which have been converted to Ore Reserves. The 2022 exclusive Mineral Resource estimate includes no long-term iron ore stockpiles, as the low-grade stockpiled Mineral Resources at Sishen were converted to Ore Reserves in 2021 and the medium-grade stockpiled Mineral Resources at Kolomela mine were converted to Ore Reserves in 2022. The Mineral Resources are not an inventory of all mineral occurrences identified, but an estimate of those which, under assumed and justifiable technical, environmental, legal and social conditions, have RPEEE as per Kumba's current understanding of its value chain and market conditions. The location, quantity, grade, continuity and other geological characteristics of the Mineral Resources are known, interpreted and estimated from specific geological evidence and knowledge, including sampling.

Mineral Resources are reported exclusively, i.e. in addition to Ore Reserves. The exclusive Mineral Resource tonnages are summarised per site and per confidence class in **Figure 5**.

## Exclusive Mineral Resource summary

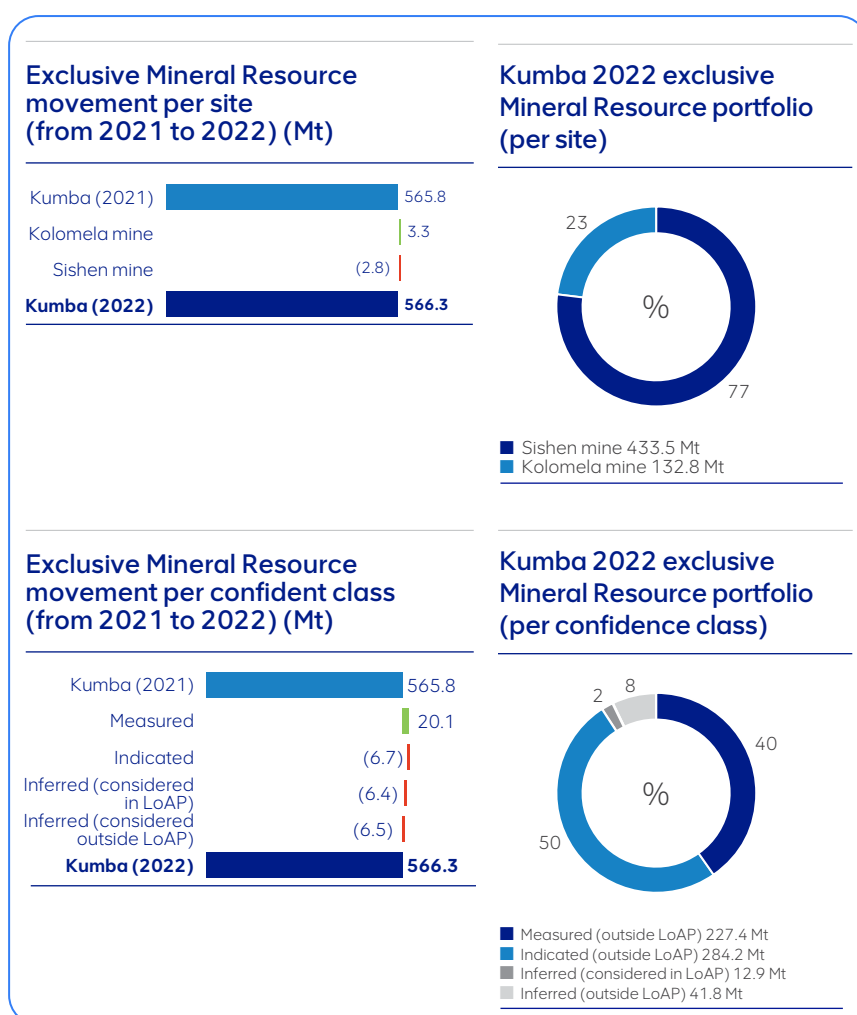
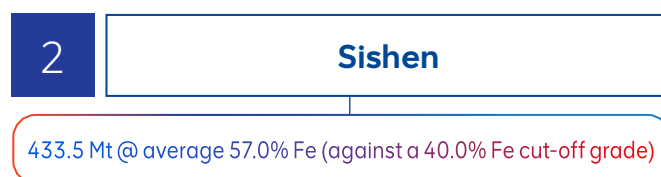
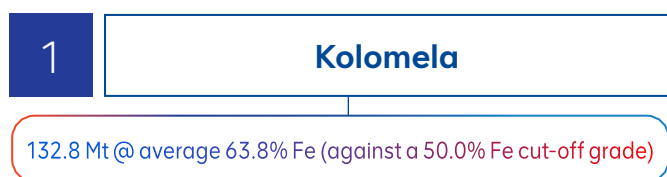


Figure 5: Kumba 2022 (versus 2021) exclusive Mineral Resource summary

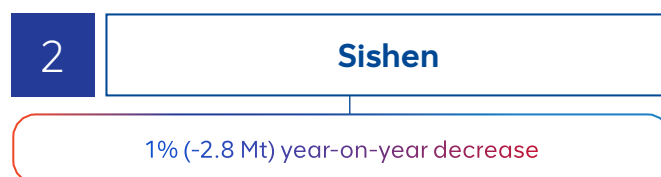


As at 31 December 2022, Kumba's remaining exclusive (in addition to Ore Reserves) Mineral Resource base is estimated at 566.3 Mt at an estimated average *in situ* grade of 58.6% Fe.



#### Year-on-year movement

A minor net increase of 0.5 Mt is noted for the overall Kumba exclusive Mineral Resource compared to 2021. The average *in situ* Fe of the exclusive Mineral Resources has increased from 58.3% in 2021 to 58.6% in 2022, primarily as a result of the conversion of the long-term stockpiled medium-grade Mineral Resources (high-grade ore diluted with ferruginised BIF) at Kolomela mine to Ore Reserves, removing the medium-grade material at lower Fe values from the Kolomela exclusive Mineral Resource portfolio.



Primarily as a result of the reallocation of some of the Kapstevel South Ore Reserves to Mineral Resources (+14.9 Mt) as a result of a decrease in the size of the Kapstevel South pit layout, partially offset by a decrease in medium-grade Mineral Resources (-8.7 Mt) declared on long-term stockpiles in 2021, being converted to Ore Reserves in 2022.

(The total annual movement balance is detailed in footnotes to **Table 7**)

As a result of depletion. The 2022 Sishen exclusive Mineral Resource estimate was derived by depleting the 2021 Sishen geological model to align with the decision taken to estimate the 2022 Ore Reserves by depleting the 2021 LoAP.

(The total annual movement balance is detailed in footnotes to **Table 7**)

The overall Measured plus Indicated versus Inferred exclusive Mineral Resource ratio changed from 88 : 12 in 2021 to 90 : 10 in 2022, as a result of the conversion of Inferred to Indicated and Measured Mineral Resources with continued exploration at both mining operations.

# Purpose

This statement describes the foundation for Kumba's long-term business as per the Company's current understanding, thinking and planning.

It is the objective of this statement to declare the Kumba Ore Reserves (and Saleable Product) and exclusive Mineral Resources as remaining at 31 December 2022 and compare it with the 31 December 2021 published figures. In addition, it aims to provide all relevant detail in support of the statement to explain how the Ore Reserve and Mineral Resource estimates were derived and what aspects thereto may be material for investment decisions.

It must be noted that the Mineral Resource and Ore Reserve figures presented in this statement are estimates, and although it has been derived to the best possible knowledge of the

Competent Persons (CPs), it is inherently subject to some level of uncertainty and inaccuracy, based on forward looking assumptions, and subject to known associated risks as well as risks related to unforeseen events. The respective CPs, however, take full responsibility for the Mineral Resource and Ore Reserve declarations.

This statement is the collective view of the Ore Reserve and Mineral Resource CPs and strives to deliver a transparent and material view of the Kumba Ore Reserves and Mineral Resources to inform all relevant stakeholders.

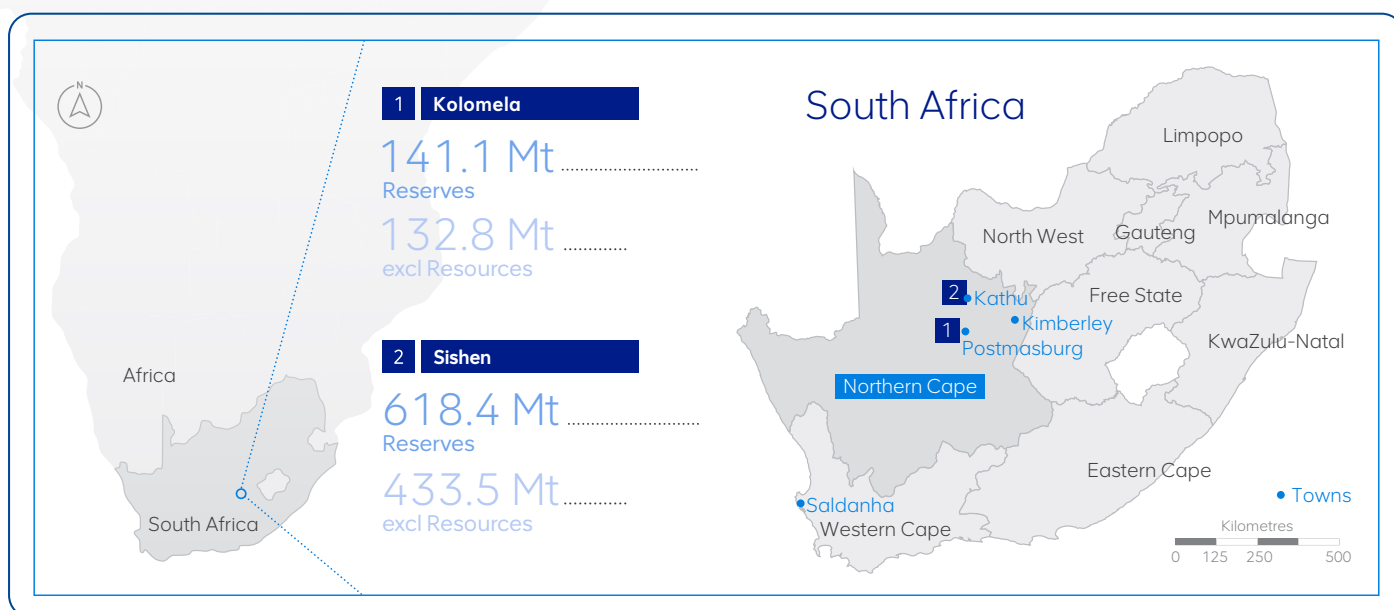


# Location

Location of operations and exploration projects is dictated by geology.

All the Kumba sites for which Ore Reserves and/or Mineral Resources were declared in 2021 are located within the Republic of South Africa (**Figure 6**). As is the case with all mineral companies, the location of operations and exploration projects is dictated by geology.

The Kumba operations (Kolomela and Sishen) are located in the Northern Cape province.



**Figure 6:** Geographical locations of Kumba operations and projects for which Ore Reserves and Mineral Resources have been declared

The WGS84 latitude/longitude geographical coordinate map references of the Kumba entities for which Ore Reserves and/or Mineral Resources have been declared in 2022 are listed below:

| 1   | Kolomela | 2  | Sishen |
|---|----------|--|--------|
| Kolomela mine in the Northern Cape province near the town of Postmasburg<br>(28°23'30.05" S and 22°58'46.88" E) |          | Sishen mine in the Northern Cape province near the town of Kathu, which accounts for the bulk of Kumba's production<br>(27°44'02.29" S and 23°00'39.95" E) |        |

# Attributable ownership

Kumba has access to its Ore Reserves and Mineral Resources through SIOC, in which it has 75.37% attributable ownership.

Kumba, a business unit of the Anglo American plc (AA plc) group as the major shareholder, has access to its Iron ore Reserves and Resources through SIOC, the entity to which the mining and prospecting rights have been granted. The relevant Kumba ownership structure is illustrated in **Figure 7**.



**Figure 7:** Kumba ownership structure (at the time of reporting)

For this statement, all Ore Reserve (and Saleable Product) and Mineral Resource estimates, whether Kumba's attributable ownership in the specific mineral asset is less than 100% or not, are reported as 100%, with the percentages attributable to Kumba indicated in the relevant tables. The overall proportion attributable to SIOC, Kumba and AA plc is summarised in **Table 1**.

Due to the new SIOC Employee Share Ownership Trust that came into effect during 2022, the effective shareholding of Kumba in SIOC changed from 76.3% in 2021 to 75.4% in 2022.

**Table 1:** SIOC, KIO and AA plc mineral asset ownership (31 December 2022)

| Mineral asset | % owned by SIOC |      | % owned by Other via SIOC |      | % owned by Exxaro via SIOC |      | % owned by Kumba Iron Ore via SIOC |      | % owned by AA plc via KIO <sup>1</sup> |      |
|---------------|-----------------|------|---------------------------|------|----------------------------|------|------------------------------------|------|--|------|
|               | 2022            | 2021 | 2022                      | 2021 | 2022                       | 2021 | 2022                               | 2021 | 2022                                   | 2021 |
| Kolomela      | 100             | 100  | 4.2                       | 3.1  | 20.4                       | 20.6 | 75.4                               | 76.3 | 52.5                                   | 53.2 |
| Sishen mine   | 100             | 100  | 4.2                       | 3.1  | 20.4                       | 20.6 | 75.4                               | 76.3 | 52.5                                   | 53.2 |

<sup>1</sup> The holding Company, SIOC, is 75.4% owned by KIO; and KIO is 69.7% owned by AA plc (as at 31 December 2022).



# Security of tenure

## Kumba's right to mine.

All Ore Reserves (and Saleable Product) and Mineral Resources (in addition to Ore Reserves) quoted in this document are held under notarially executed and registered mining rights granted to SIOC in terms of the Mineral and Petroleum Resources Development Act No 28 of 2002 (MPRDA) by the DMRE of the South African government. Kumba holds a 75.4% share in SIOC (at the time of reporting).

### Status of mining rights

SIOC is the holder of mining rights for both its operations and the rights are of sufficient duration to enable the complete execution of the LoAPs from which the Ore Reserves and Saleable Product have been derived. In terms of the MPRDA, SIOC also has the exclusive right to extend the period of these mining rights, if so required.

The status of the mining rights as at 31 December 2022 are as follows:

**Kolomela** was granted a mining right for iron ore on 18 September 2008 for a 30-year mining period.

The following deeds of amendment/variation in terms of section 102 of the MPRDA were registered at the Mineral and Petroleum Titles Office: Pretoria on 31 July 2019 to amend:

- clause 8 ("Conditions on disposal of Minerals and/or Products Derived from Mining") of the mining right
- clause 1 of the mining right by substituting the diagram/ marked as Annexure C to the mining right with the approved SG Mining Right diagram N179/2015 and amending clause 1 of the mining right by amending the extent as it appears under measurement from 16,941.92 ha to 16,954.1466 ha

The deed to amend the Kolomela mining right and the mining work programme to include Farm 364 (Heuningkranz) and portion 1 of Farm 432 (Langverwacht) of the former Heuningkranz prospecting right, was registered on 2 October 2019.

An electronic version of the Kolomela Mining Work Programme, updated to align with the 2022 LoAP, was loaded onto the SAMRAD system on 13 October 2022 and the hard-copy version was submitted at the DMRE (Kimberley Office) on 18 October 2022 for consideration.

The latest Social and Labour plan application for the period 2020 to 2024 was granted by the DMRE on 19 November 2021.

**Sishen** was granted a mining right for iron ore and quartzite on 11 November 2009 for a 30-year mining period. The mining right area was expanded in 2014, following a section 102 application to amend the mining right to incorporate the old Transnet railway properties transecting the mining area from north to south. The application was granted by the DMRE on 28 February 2014.

The Sishen mining right was again amended in 2016 to award SIOC the outstanding 21.4% undivided share previously held by

ArcelorMittal South Africa in the Sishen mining right.

The Sishen mining right was further amended during 2018 to include the Dingleton properties (community relocated by SIOC) into the Sishen mining right.

The following deeds of amendment/variation, in terms of section 102 of the MPRDA, were registered at the Mining Titles Office on 6 and 7 November 2019:

- Notarial deed of amendment/variation (inclusion of the railway properties)
- Notarial deed of amendment/variation (addition of the 21.4% undivided share in iron ore and quartzite, previously held by ArcelorMittal South Africa)
- Notarial deed of amendment/variation (inclusion of the Dingleton properties)

An updated Sishen Mining Work Programme, to align with the larger pit layout and inclusion of low-grade ore as Ore Reserves in 2021, was submitted to the DMRE on 22 December 2022.

The original version of Sishen mine's Social and Labour plan update, compiled for the period 2022 to 2026, was not approved by the DMRE, which requested more detailed deliberations between SIOC and the Gamagara Local Municipality, the outcome to be included in a revised Social and Labour plan application. The revised Social and Labour plan application was submitted to the DMRE on 21 December 2022.

### Legal proceedings in relation to Kumba's mining rights

Working through the Anglo American Legal Department, which has appointed a legal service provider, SIOC has lodged objections in terms of section 10(2), and, where appropriate, appeals in terms of section 96(1) of the MPRDA against the granting of prospecting right applications to 11 entities by the DMRE over certain farm portions, included in the Kolomela and Sishen mining rights, as well as over land owned by SIOC which does not fall within the SIOC mining right areas, but on which SIOC has current or future activities planned.

### Status of environmental authorisations associated with mining rights

All required permits and licensing to operate the Kolomela and Sishen mine operations have been granted. The following applications considering future projects are pending approval by the relevant governmental authorities:

#### Kolomela

- Integrated water use licence amendment

# Security of tenure cont.

## Sishen

- Amendment of the environmental management programme (EMPr) to allow for the rezoning of the tyre-processing yard in the industrial area in Kathu
- Amendment of the EMPr for the planned mining of the Vliegsveld west and far south areas
- Environmental impact assessment application for the Pushback 8, 10 and 17 mining areas, including the establishment of a contactor heavy mining equipment workshop
- Application for hydroponic water use licence
- Environmental authorisation for solar photovoltaic (PV) plant

## Waste licensing associated with mining rights

All relevant waste licensing is in place.

## Closure cost associated with mining rights

In terms of immediate closure cost:

- The Kolomela closure costs (as at the time of reporting) amounts to R1,681 million (a total of R154 million is provided for within the KIO Rehabilitation Trust Fund with an additional R1,221 million furnished through bank guarantees); guarantees for the shortfall of R307 million will be issued during 2023.
- The Sishen closure costs (as at the time of reporting) amounts to R4,205 million (a total of R642 million is provided for within the KIO Rehabilitation Trust Fund with an additional R3,595 million through bank guarantees); currently there is a surplus of R32 million at 31 December 2022.

## Royalties associated with mining rights

Kumba's royalty contribution to the South African government's fiscus for 2022 amounted to R1,476 million:

- R541 million for Kolomela
- R935 million for Sishen

## Status of prospecting rights

Kumba has declared no Mineral Resources or Ore Reserves on prospecting rights.

SIOC has submitted a closure application for the Zandriverspoort prospecting right, as was acknowledged by the Regional Manager of the DMRE office in Limpopo on 22 November 2021. The right expired on 21 March 2020. The closure certificate has not been issued yet.

## Land use

With the completion of the relocation of the Dingleton community, the Dingleton town, located west of Sishen mine, had to be de-proclaimed to enable future mining. All three phases of the de-proclamation of the Dingleton urban areas at Sishen have been approved by the District Municipal Planning Tribunal, with phase 3 approval received on 6 April 2022. The relevant SG diagram has been submitted to the Surveyor General's office for approval and will be registered at the Deeds Office once all transfers have been completed.

## Environmental, social and governance (ESG) reporting deviation

Kumba, in collaboration with its parent company Anglo American, is evaluating the reporting requirements of the

newly introduced South African guideline for the reporting of environmental, social and governance parameters (SAMESG Guideline).

It must be noted that the SAMESG Guideline has not been incorporated into the JSE Listings Requirements as stipulated for minerals companies. In 2022, Kumba will again provide comprehensive feedback in this regard using its annual sustainability report following the GRI's Sustainability Reporting Standards (core compliance) and Mining Sector Supplement. The reporting is also aligned with the AA1000 stakeholder engagement standard, the sustainable development principles and reporting framework of the International Council on Mining and Metals, and the principles of the United Nations Global Performance Compact.

The following climate change ambitions have been set for Kumba to be achieved by 2030 (please refer to the newly introduced Climate Change report in the Kumba suite of reports for 2022)

- 30% reduction target in net greenhouse gas emissions
- 50% reduction target in fresh water use

In line with these ambitions, Kumba has developed a roadmap to achieve these targets by 2030, with the main focus being on the construction of a 67 MW solar PV plant at Sishen as well as a 10 MW (solar or wheeled wind) facility at Kolomela by 2025.

Anglo American has also launched the first of a chartered fleet of 10 liquefied natural gas (LNG) dual-fuelled Capesize+ vessels, with the Ubuntu Harmony, which loaded its first cargo of Kumba iron ore product at the Saldanha harbour at the west coast of South Africa in January 2023. It is estimated that these vessels will realise a 35% reduction in CO2 emissions compared to ships fuelled by conventional marine oil fuel. The use of LNG will also lead to a significant reduction of nitrogen oxides and particulate matter from vessel exhausts, while new technology also eliminates the release of unburnt methane.

Other projects currently under investigation are:

- the wheeled renewable electricity project, where the Anglo group is investigating procuring renewable (off-site wind and solar PV and storage) electricity from project GAIA
- the green mobility project, where Anglo is in the process of considering the roll-out of its hauling trucks fuelled by green hydrogen



LNG dual-fuelled Capesize+ vessel, the Ubuntu Harmony

# Competence

Kumba considers its relevant technical specialists as competent to declare Ore Reserves and Mineral Resources, in accordance with the SAMREC Code (2016 Edition), to provide the decision-maker with a transparent and material insight into the Company's Ore Reserve and Mineral Resource status at a given point in time.

The Ore Reserve and Mineral Resource estimates were prepared under the direct supervision of CPs as defined in the SAMREC Code (2016 Edition). All Mineral Resource CPs have sufficient relevant experience in the estimation, assessment and evaluation of the style of mineralisation and type of iron ore Mineral Resources, and all Ore Reserve CPs have sufficient relevant experience in the estimation, assessment and evaluation of the economic extraction of iron ore Ore Reserves through open-pit mining methods. All the CPs consent to the

inclusion in this report of the information in the form and context in which it appears. All CPs (**Table 2** and **Table 3**) informing the 2022 Kumba Ore Reserve (and Saleable Product) and Mineral Resource report assumed responsibility by signing a Competent Person appointment letter, kept by the Company's Principal – Resource Geology, at Anglo American's Rosebank office in Johannesburg, South Africa. These letters contain the full name, address, professional qualifications, and relevant experience of the CPs.

**Table 2: Corporate responsibility – Lead Competent Persons – Kumba corporate office**

| Business unit  | Field             | Name         | Title                       | Employed by                                 | Professional organisation                | Registration number | Years' relevant experience |
|----------------|-------------------|--------------|-----------------------------|---|--|---------------------|----------------------------|
| Kumba Iron Ore | Mineral Resources | Jean Britz   | Principal Mineral Resources | Sishen Iron Ore Company Proprietary Limited | SACNASP** Professional Natural Scientist | 400423/04           | 18                         |
|                | Ore Reserves*     | Theunis Otto | Head Mining Engineering     | Sishen Iron Ore Company Proprietary Limited | ECOSA*** Professional Engineer           | 990072              | 18                         |

\* The term "Ore Reserves" in the context of this report has the same meaning as "Mineral Reserves", as defined by the SAMREC Code. The term "Ore Reserves" is preferred because it emphasises the difference between these and Mineral Resources.

\*\* SACNASP – South African Council for Natural Scientific Professions (<https://www.sacnasp.org.za/> - Address: Management Enterprise Building, 1 Mark Shuttleworth Street, Innovation Hub, Pretoria).

\*\*\* ECOSA – Engineering Council of South Africa (<https://www.ecosa.co.za/default.aspx> - Address: Lake Office Park, 1st Floor, Waterview Corner Building, 2 Ernest Oppenheimer Avenue, Bruma, Johannesburg, 9301).

**Table 3: Mining operation responsibility – Kumba operations**

| Operations  | Field             | Name              | Title                                   | Employed by                                 | Professional organisation              | Registration number | Years' relevant experience |
|-------------|-------------------|-------------------|---|---|--|---------------------|----------------------------|
| Kolomela    | Mineral Resources | Venter Combrink   | Specialist Modelling Resource Geologist | Sishen Iron Ore Company Proprietary Limited | SACNASP Professional Natural Scientist | 400053/08           | 19                         |
|             | Ore Reserves      | Grant Crawley     | Professional Mining Engineer            | School of Rock (owner)                      | ECOSA Professional Engineer            | 20130120            | 11                         |
| Sishen mine | Mineral Resources | Mike Carney       | Professional Natural Scientist          | VBKOM (sub-contracted)                      | SACNASP Professional Natural Scientist | 400096/99           | 21                         |
|             | Ore Reserves      | Derek Esterhuysen | Principal Mining Engineer               | Sishen Iron Ore Company Proprietary Limited | ECOSA Professional Engineer            | 20040033            | 14                         |



# Competence cont.

The Lead CPs for Ore Reserves and Mineral Resources as appointed in 2022 can, without any qualifications, state that:

- The Ore Reserve and Mineral Resource figures presented in this report are considered to be a true reflection of the Ore Reserve and Mineral Resource estimates as at 31 December 2022 for Kumba, and that public reporting is based on-site-specific R&R Statements that have been carried out in accordance with the minimum standards and guidelines of the SAMREC Code (2016 Edition) as verified and to the best of the knowledge of the CPs.
- The Ore Reserve and Mineral Resource figures quoted in this report have been reviewed by a panel of peers, including technical specialists from Anglo American and Exxaro.
- The Lead CPs have not been unduly influenced by KIO or any person commissioning the Ore Reserve (and Saleable Product) and Mineral Resource report and are of the opinion that all critical assumptions are documented, and adequate disclosure is made of all material aspects that the informed reader may require, to make a reasonable and balanced judgement of the Ore Reserve and Mineral Resource figures.
- The Lead CPs have sufficient experience relevant to the style and type of mineral deposit under consideration and to the activity which is being undertaken to qualify as a Competent Person as defined in the SAMREC Code (2016 Edition).
- The Lead CPs consent to the inclusion of the public R&R information (as defined in the Kumba R&R policy and reporting procedure documents) in the form and context in which it appears in this statement in the KIO integrated report as well as in the AA plc R&R report and R&R summary section of the AA plc annual report.

Kumba appreciates any feedback regarding the competency, materiality and transparency with which its Ore Reserves and Mineral Resources have been presented in this report.

**Feedback:** ([jean.britz@angloamerican.com](mailto:jean.britz@angloamerican.com))

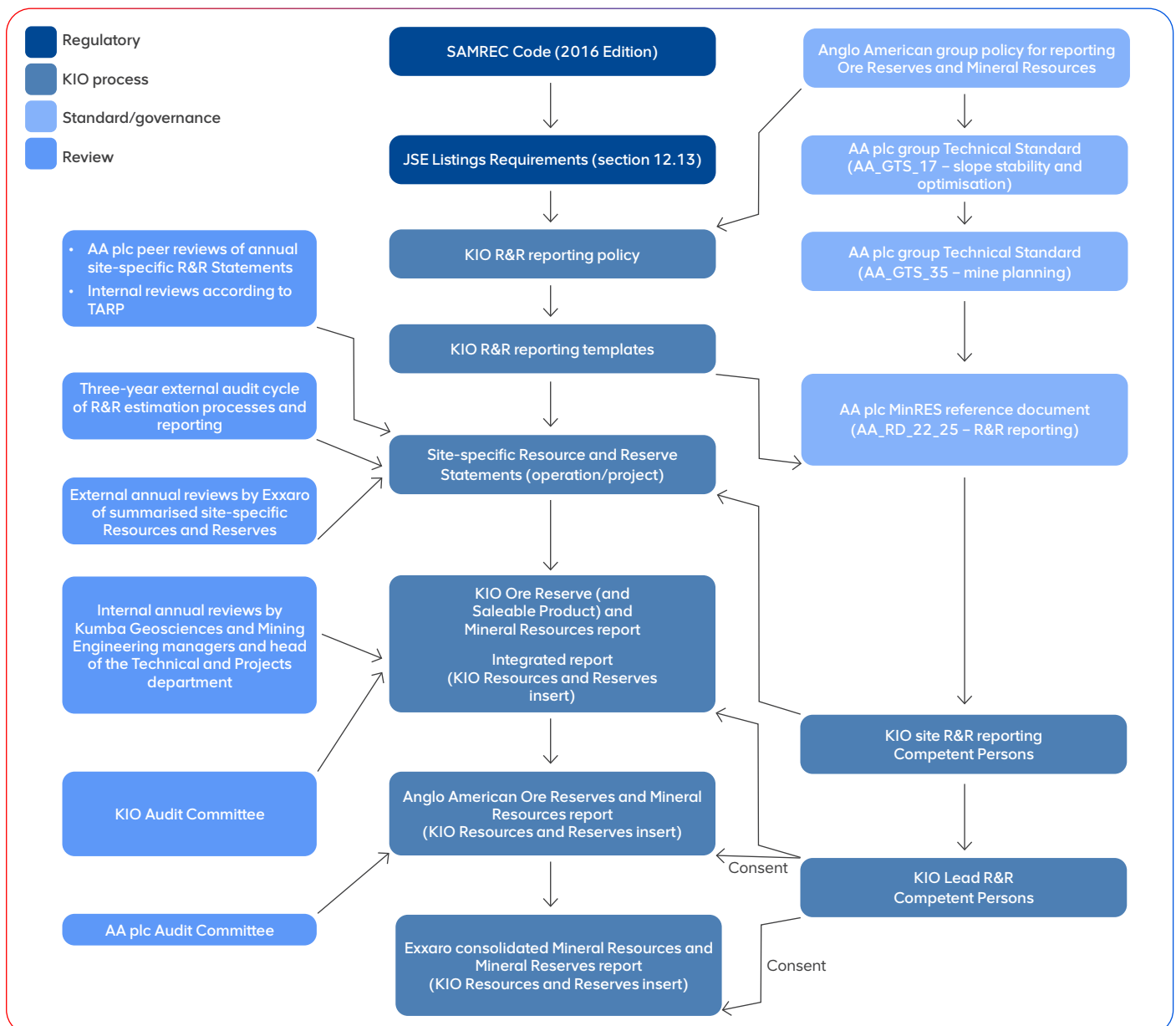
# Governance

Kumba, through Anglo American plc, applies a rigorous scheduled governance programme to ensure representative Ore Reserve (and Saleable Product) and Mineral Resource reporting.

Applicable resource and reserve reporting codes are applied throughout Anglo American via a group policy for the reporting of Mineral Reserves and Mineral Resources, which holistically governs Resource and Reserve reporting for all the AA plc business units, of which Kumba forms part. The policy is supported by a requirements document [AA\_RD\_22\_25 – Version 13 (2022)] which sets out the minimum requirements for Resource and Reserve reporting throughout the Anglo group to ensure a uniform approach to reporting and adherence

to the latest applicable national reporting codes, which in the case of Kumba is the SAMREC Code (2016 Edition). The requirements document is revised annually prior to resource and reserve reporting, with refinements approved by the AA plc R&R Reporting Committee. Kumba, being a JSE-listed entity, has its own Ore Reserve and Mineral Resource reporting policy.

The Kumba R&R reporting governance framework is summarised in **Figure 8**.



**Figure 8:** Kumba R&R reporting governance framework

# Assurance

Kumba follows a structured internal and external review programme to not only verify Ore Reserve (and Saleable Product) as well as Mineral Resource reporting, but also the estimation thereof.

The Anglo American and KIO Audit Committees require all reporting entities (operations, projects and exploration) to undergo a continuous and comprehensive programme of audits and reviews aimed at providing confidence and assurance in respect of all components contributing to the Ore Reserve and Mineral Resource estimation processes and the public reporting of those estimates.

As most of the Kumba R&R estimation and reporting is conducted by SIOC-employed technical specialists and CPs, Kumba recognises the importance of independent external audits of its R&R estimation and reporting processes and associated output to provide assurance regarding its published R&R estimates. Since the inception of KIO, its executive management has sustained a governance cost centre that sponsors or allows for the contracting of a reputable

independent external mining consultancy firm, to be changed every four years.

Kumba requires that each operation/project, for which Ore Reserves and/or Mineral Resources are declared, undergoes an external independent due diligence audit once every three years. The scope of work encompasses a due diligence (sign-off) audit of about six to eight weeks and must include a one-week site visit by the auditors. The audit should not only produce ranked findings but also ranked opportunities. Ranking is conducted according to the Anglo American risk matrix (Figure 9), a standard adopted by all disciplines/functions within the group as part of its risk management process to allow for a uniform approach to the assessment and comparisons of risks across the value chain.

| Probability    |  | Consequence<br>(Where an event has more than one "consequence type", choose the "consequence type" with the highest rating) |       |          |      |       |
|----------------|--|---|-------|----------|------|-------|
|                |  | Insignificant   | Minor | Moderate | High | Major |
|                |  | Risk level  |       |          |      |       |
| Almost certain | 90% and higher probability of occurring      | 11  | 16    | 20       | 23   | 25    |
| Likely         | Between 60% and less than 90% of occurring   | 7   | 12    | 17       | 21   | 24    |
| Possible       | Between 30% and 60% probability of occurring | 4   | 8     | 13       | 18   | 22    |
| Unlikely       | Between 1% and 30% probability of occurring  | 2   | 5     | 9        | 14   | 19    |
| Rare           | Less than 1% probability of occurring        | 1   | 3     | 6        | 10   | 15    |

| Risk rating | Risk level  |
|-------------|-------------|
| 21 to 25    | High        |
| 13 to 20    | Significant |
| 6 to 12     | Medium      |
| 1 to 5      | Low         |

| Guidelines for risk matrix   |
|--|
| A high risk exists that management's objectives may not be achieved. Appropriate mitigation strategy to be devised immediately.                                  |
| A significant risk exists that management's objectives may not be achieved. Appropriate mitigation strategy to be devised as soon as possible.                   |
| A moderate risk exists that management's objectives may not be achieved. Appropriate mitigation strategy to be devised as part of the normal management process. |
| A low risk exists that management's objectives may not be achieved. Monitor risk, no further mitigation required.  |

Figure 9: Anglo American risk matrix

## Internal reviews/validations

### Mineral Resources

The borehole data informing geological models is validated to determine assay representivity using an extensive quality assurance/quality control (QA/QC) programme monitoring and reporting on primary sampling (including sample location), sample preparation and sample assay accuracy and precision. In addition, borehole database validations are conducted to ensure relational information is correct. The fact that the Kumba borehole databases contain historical information (generated

prior to 2010) that were QA/QC validated is addressed by determining a sample representivity index for each sample, by means of a scorecard approach, weighting-indexed parameters such as type of drilling, material recovery, QC parameters of sample preparations and QC parameters of sample assaying. The resulting sample representivity index is spatially applied and considered during geological confidence classification.

Geological solids models (visual step-through, gaps and overlaps and adherence to borehole lithological contacts) are



peer reviewed and geological block models (exploratory data analysis, variography and search parameters as well as spatial grade estimations) are peer reviewed and spatially reconciled against the previous geological block models.

For geological models informing areas being mined, the geological model is reconciled against an unmodified ore control model (informed by additional ore control borehole data generated after the geological model compilation) as part of the operations' value chain reconciliation processes, and this comparison is used to quantify geological losses and gains.

### Internal Mineral Resource findings

The Sishen value chain reconciliation process identified geological gains (>10%) for the high-grade ore with concomitant losses (>10%) in the low-grade portion. An investigation revealed that the high-grade ore gains are mainly due to the lag (due to model size and complexity) in collecting geological borehole information and updating the geological model that is used to inform the LoAP.

*Mitigation actions: The high-grade ore geological gains have been investigated and it was identified that an outdated geological model (not considering a substantial amount of additional ore control borehole data generated in 2021) is the root cause for the geological gains. The 2022 geological model update was only focussed on the additional exploration borehole information in the Dingleton area. However the 2023 geological model update (that was already commissioned in 2022) considers the additional borehole information for all the mining areas generated before the cut-off date of 31 May 2022, for the lithological domains informing the high-grade Mineral Resources as well as the lithological domains informing the medium- and low grade ore domains. The model update has confirmed significant year-on-year geological gains for high-grade ore. The loss in low-grade ore will be further investigated.*

### Ore Reserves

Geological block models are converted into mining block models and comparisons are performed to understand the dilution and mining loss components during up-blocking to SMU resolution. Other modifying factors, such as geological gains/losses and mining recovery efficiencies, are referenced against three-year averaged value chain reconciliation results and assigned to the mining block model by means of a single long-term planning modifying factor as derived per material type.

Subsequent pit optimisation is conducted using approved long-term economic assumptions and approved geotechnical input parameters to derive pit and resource shells. The latter is peer reviewed whereafter pit and pushback layouts are designed and again validated in terms of practical vs. economical execution and, most importantly, pit safety in terms of slope stability considering geohydrological and geotechnical aspects.

An LoA schedule exercise is then conducted to consider various scenarios required by the business. Such scheduling is informed by the Ore Reserves and Inferred Mineral Resources located inside the pit layout as well as run-of-mine buffer stockpile material, and honours thresholds on Saleable Product qualities, run-of-mine buffer stockpile levels, exposed ore and mining and beneficiation infrastructure capacities as approved by a Kumba Planning Steering Committee. The chosen LoAP scenario, of which the first five years are aligned with the business plan, is peer reviewed by the internal technical specialists and signed

off by all relevant stakeholders up to executive level in the Company.

Ore Reserve (and Saleable Product) and Mineral Resource reporting is peer reviewed internally by Kumba, but also undergoes an independent internal peer review by technical specialists of Anglo American's corporate office.

Kumba's 2022 Ore Reserve and Mineral Resource estimates were peer reviewed for the first time in December 2022 by SIOC's second largest Shareholder, i.e. Exxaro Resources Limited.

### Internal Ore Reserve findings

No high or significant risk internal review findings were registered for the 2022 Ore Reserve and Saleable Product estimates.

### External audits

#### Cube Consulting (Australia) audit of 2021 Kolomela Ore Reserve (and Saleable Product) and Mineral Resource estimates and reporting

Due to the detailed scope (in-depth analysis on estimation and reporting) required by Kumba in terms of the external auditing of its Ore Reserves and Mineral Resources, the audit results are always in retrospect, but the mitigation actions on findings are applied to current and forthcoming Reserve and Resource estimates. An external due diligence audit (including a one-week site visit) of the Kolomela mine 2021 Ore Reserve and Mineral Resource estimation processes and reporting was conducted in 2022.

The external due diligence audit (audit report: Kolomela\_RR\_Audit\_221018 ) revealed:

- no high or significant risk audit findings pertaining to the 2021 Kolomela Mineral Resource estimation processes and Sishen Mineral Resource reporting
- no high or significant risk audit findings pertaining to the 2021 Kolomela Ore Reserve (and Saleable Product) estimation processes and Sishen Ore Reserve (and Saleable Product) reporting

### Attestation

For the attestation process it is confirmed that:

- the ORMR, set out on pages 2 to 70, fairly present in all material respects the latest Ore Reserve (and Saleable Product) and Mineral Resource estimates in a transparent and material matter to conform to the SAMREC Code (2016 Edition), as well as Section 12.13 of the JSE Listings Requirements
- no facts have been omitted or untrue statements made that would make the ORMR false or misleading
- estimation and reporting controls have been put in place to ensure that material information relating to Kumba have been provided to effectively prepare the ORMR
- the internal financial controls are adequate and effective and can be relied upon in compiling the ORMR.

Where we are not satisfied, we have disclosed to the Audit Committee and the auditors the deficiencies in design and operational effectiveness of the internal financial controls, and have taken the necessary remedial action.

The key Resource and Reserve reporting controls were validated and attested to be effective, adequate and fully executed for 2022 by the Kumba Chief Executive and Chief Financial Officer on 20 February 2023.

# Ore Reserves (and Saleable Product)

Kumba's drive to accurately plan and extract the maximum value from its mineral endowment through safe, responsible and cost-effective production which meets its Clients' requirements.

Kumba applies a uniform Ore Reserve estimation process at all its sites as explained below:

## Reserve estimation

|                        | Explanation  | Software   |
|------------------------|--|--|
| Mining block modelling | The <i>in situ</i> Mineral Resource tonnages and grades as estimated and classified within 3D geological block models are initially modified by converting the geological block models into mining block models, considering selective mining unit sizes.  | GEOVIA Surpac™ and Deswik™                           |
|                        | With the up-blocking of the geological block model to mining block model resolution, planned modifying factors such as dilution and mining losses are realised while other factors such as geological losses and mining recovery efficiencies, determined via value chain reconciliation of actual geological accuracies and extraction efficiencies, are applied to convert <i>in situ</i> ore to a run-of-mine ore equivalent.   |  |
| Pit optimisation       | The resultant mining block model is constrained via pit optimisation, using various fiscal parameters and geotechnical slope inputs, to spatially distinguish between ore which is currently (revenue factor 1 pit shell) and eventually economically extractable (revenue factor 1.6 pit shell). The fiscal parameters used for pit optimisation are explained in a separate section.   | GEOVIA Whittle 4X™                                   |
| Pit design             | The optimal pit shell is engineered or designed into a safe practical pit layout, considering geotechnical slope stability parameters, equipment aligned haul road and ramp as well as bench definitions. The pit layout envelopes the current economically extractable ore volume, and forms the basis for the LoAP scheduling and resultant Ore Reserve and Saleable Product estimates.  | Trimble Open Pit Design™, GEOVIA Surpac™ and Deswik™ |
| LoA scheduling         | Strategic scenarios are tested with the aim of maximising total project value (NPV) by simultaneously exploiting synergies between operating strategies. Value-based principles are applied to optimise value, given a dominant constraint. Once an optimum scenario has been identified, it is used as guidance for the detailed scheduling in the next step of the process.  | COMET Strategy™ RPM Open Pit Metals Solution™        |
|                        | The mining blocks, as constrained by the pit layout, are then scheduled using guidance from the optimum scenario as well as various equipment utilisation, mining activity effectiveness, cut-off grade and blending and stockpile philosophy inputs. The modified ore is scheduled to the various beneficiation plants and/or stockpile destinations, as well as from stockpiles to honour annual Saleable Product targets and Client off-take specifications, while the waste is scheduled to the various waste destinations. This is an iterative process as sequencing of mining activities must be such that consistent output is achieved over time. |  |
| Infrastructure match   | The infrastructure required to achieve the LoA schedule is then compared with existing infrastructure and associated lifespans and if adjustments are required in terms of equipment purchases or stoppages or changes in terms of waste dumping, etc. it is indicated as such to timeously plan the subsequent infrastructure to match the LoA schedule.  |  |
|                        | The placing of any additional permanent infrastructure is usually done outside the optimistic shell extents.   |  |
| Valuation              | The best-fit plan is valued through the assignment of value chain costs (including ESG costs) and long-term pricing and other fiscal parameters. This valuation is conducted including and excluding modified Inferred run-of-mine to indicate the risk associated with the modified Inferred run-of-mine included in the LoAP.  |  |
| Reporting              | The Proved and Probable Ore Reserves (as modified from the <i>in situ</i> Measured and Indicated Mineral Resources occurring inside the pit layout), excluding the modified Inferred run-of-mine, are then reported as Ore Reserves, and include all the planned Proved and Probable run-of-mine scheduled over the total LoA period. The Proved and Probable product derived from applying relevant yield modifications to the Proved and Probable Ore Reserves, are quoted as the Saleable Product and include all the planned Proved and Probable Saleable Product derived over the total LoA period.   |  |

## Commodity pricing and costing process

Kumba prefers not to disclose its forward looking iron ore price and therefore provides a breakdown of how it is derived. The long-term price, as obtained from the Anglo American Commodities Research Department, is adjusted by Kumba to convert it from a market figure to a site-specific figure used to define current and eventual economic extractability:

- The first adjustments made are price adjustments from the cost and freight (CFR) 62% Fine Iron Ore China price (Real, LT US\$/tonne) to the CFR Kumba product price in

China (Real, LT US\$/tonne). These adjustments are premiums for higher Fe content and Lump products, penalties for gangue adjustments and any adjustment due to Kumba price realisations achieved in the market. This represents the CFR Kumba product price in China (Real, LT US\$/tonne).

- The second adjustment is the sea freight adjustment (including estimated port and demurrage costs) and is done to reflect the long-term Kumba product price at Saldanha (Kumba's export harbour) in US\$/tonne free on-board (FOB) terms.

- Once the product prices are calculated in US\$/tonne FOB terms, the long-term real exchange rate is applied to convert the price to a Rand/tonne FOB Saldanha base.
- To calculate the Rand/tonne free-on-rail price for the products, the long-term rail cost is subtracted for each of the sites. The rail cost includes related logistics and marketing costs.
- As a final adjustment, contractual obligations are considered.

This completes the long-term adjustment process.

Site-specific long-term pricing and a long-term exchange rate as well as budget costs (representing the total mining value chain), as were used to inform the reported year's business plan, are then used to derive an optimal pit shell (1 revenue factor) and resource shell (1.6 revenue factor). The iron ore price required to obtain a 1.6 revenue factor must have been achieved historically by Kumba in the iron ore market, and therefore supports RPEEE as per Kumba's interpretation of iron ore price cycles.

### Application of modifying factors

Apart from the pit optimisation and subsequent engineered pit layout design (to spatially isolate ore that can be economically extracted), Kumba also applies other modification factors to convert *in situ* Mineral Resources into Ore Reserves.

The first is **cut-off grade**. At Kumba, the Ore Reserve cut-off grade of each site is primarily determined by the processing plant's capability to produce product to the correct grade

specification. Studies conducted determined the feed (run-of-mine) grade required to achieve product grade after processing. The average run-of-mine grade in turn informed the Ore Reserve cut-off grade by means of applying cumulative site-specific grade tonnage curves. As a secondary measure, a breakeven cut-off grade calculation is done to ensure profitability is maintained in the short term.

The second step of modification involves the up-blocking of the geological block model into a mining block model to achieve a mining block model resolution that matches the SMU X, Y and Z dimensions. An SMU represents the smallest economical but practical mineable unit as derived through optimisation studies considering site-specific ore geometry and mining equipment loading and hauling capacities. The resulting mining block Z boundaries also coincide with bench definitions as per the pit design. During the up-blocking, some waste material is included in SMU-sized ore blocks, which is calculated as **dilution**, and similarly some ore material is included in SMU-sized waste blocks, which in turn is calculated as a **mining loss**.

Subsequently, the resource-to-reserve conversion process must consider geological accuracy and mining efficiencies. This is done by applying a **long-term planning modifying factor**, which is a combination of site-specific geological loss/gain factors as well as mining recovery efficiencies as determined by the value chain reconciliation process, comparing actual with planned performance.

**Geological gains/losses** are determined by the Kumba value chain reconciliation process, whereby the resource model is compared to the Unmodified Ore Control Model, the latter informed by additional ore control borehole and pit mapping information for areas that have been mined.

**Mining recovery efficiency** is also determined by the Kumba value chain reconciliation process, whereby the reserve model is compared to the ex-pit tonnages as officially surveyed for areas that have been mined.

Furthermore, where applicable, a **design recovery efficiency factor** is also applied for areas where it is evident that the pit design has not been achieved with actual mining, to consider sterilisation of ore at depth as a result of the former.

It must be noted that this process converts *in situ* Mineral Resources into run-of-mine. Only Measured and Indicated Mineral Resources are converted to Proved and Probable Ore Reserves. Inferred Mineral Resources are not converted to Ore Reserves and are separately reported in an unmodified state as exclusive Mineral Resources.

### 2022 versus 2021 Saleable Product

Saleable Product has been derived through the application of:

- beneficiation (yield and associated product grade) algorithms to the Proved and Probable portions (per ore type) of the scheduled run-of-mine at Sishen mine. The beneficiation algorithms have been derived from geometallurgical (densimetric) borehole data and adjusted or scaled up to represent plant beneficiation using measured plant beneficiation efficiencies at Sishen mine

- empirically estimated yield and Saleable Product grade performances (per ore type) to the Proved and Probable portions of the scheduled run-of-mine at Kolomela

Apart from beneficiation, run-of-mine blending is one of the main levers used during scheduling to ensure that the resultant iron ore product is suitable for off-take in current market conditions.



# Ore Reserves (and Saleable Product) cont.

The 2022 Kolomela and Sishen LoAPs, considering current contract and Client supply agreement conditions, deliver a total estimated Saleable Product of 532.2 Mt at an average 63.5% Fe over the reserve life years for the two mining operations (**Table 4**).

**Table 4: Kumba's Saleable Product for 2022 (referenced against 2021)**

| Operation/Project                                   | Operation status | Mining method | Ore type  | % owned by KIO | Saleable Product category | Yield % |      | Saleable Product |                      |              |                      |
|---|------------------|---------------|-----------|----------------|---------------------------|---------|------|------------------|----------------------|--------------|----------------------|
|   |                  |               |           |                |                           | 2022    | 2021 | 2022             |                      | 2021         |                      |
|   |                  |               |           |                |                           |         |      | Tonnage (Mt)     | Grade (% Fe) Average | Tonnage (Mt) | Grade (% Fe) Average |
| Mining operations                                   |                  |               |           |                |                           |         |      |                  |                      |              |                      |
| Kolomela <sup>1</sup>                               |                  |               |           |                |                           |         |      |                  |                      |              |                      |
| Saleable Product from pit                           | Steady- state    | Open-pit      | Haematite | 75.4           | Proved                    | 94.3    | 96.0 | 92.3             | 64.8                 | 97.9         | 64.8                 |
|   |                  |               |           |                | Probable                  |         |      | 20.5             | 64.3                 | 31.7         | 64.5                 |
|   |                  |               |           |                | Sub-total                 |         |      | 112.9            | 64.7                 | 129.6        | 64.7                 |
| Saleable Product from run-of-mine buffer stockpiles |                  |               |           |                | Proved                    |         |      | 0.0              | 0.0                  | 0.0          | 0.0                  |
|   |                  |               |           |                | Probable                  |         |      | 20.2             | 62.1                 | 11.1         | 64.2                 |
|   |                  |               |           |                | Sub-total                 |         |      | 20.2             | 62.1                 | 11.1         | 64.2                 |
|   |                  |               |           |                | Proved                    |         |      | 92.3             | 64.8                 | 97.9         | 64.8                 |
| Total Saleable Product                              |                  |               |           |                | Probable                  |         |      | 40.7             | 63.2                 | 42.8         | 64.4                 |
|   |                  |               |           |                | Total                     |         |      | 133.1            | 64.3                 | 140.7        | 64.7                 |
| Sishen <sup>2</sup>                                 |                  |               |           |                |                           |         |      |                  |                      |              |                      |
| Saleable Product from pit                           | Steady- state    | Open-pit      | Haematite | 75.4           | Proved                    | 64.5    | 65.0 | 255.5            | 64.7                 | 269.4        | 64.7                 |
|   |                  |               |           |                | Probable                  |         |      | 107.2            | 59.8                 | 120.4        | 61.1                 |
|   |                  |               |           |                | Sub-total                 |         |      | 362.8            | 63.3                 | 389.8        | 63.6                 |
| Saleable Product from run-of-mine buffer stockpiles |                  |               |           |                | Proved                    |         |      | 0.0              | 0.0                  | 0.0          | 0.0                  |
|   |                  |               |           |                | Probable                  |         |      | 36.3             | 63.0                 | 35.1         | 59.0                 |
|   |                  |               |           |                | Sub-total                 |         |      | 36.3             | 63.0                 | 35.1         | 59.0                 |
|   |                  |               |           |                | Proved                    |         |      | 255.5            | 64.7                 | 269.4        | 64.7                 |
| Total Saleable Product                              |                  |               |           |                | Probable                  |         |      | 143.6            | 60.6                 | 155.5        | 60.6                 |
|   |                  |               |           |                | Total                     |         |      | 399.1            | 63.2                 | 424.9        | 63.2                 |
| Company   |                  |               |           |                |                           |         |      |                  |                      |              |                      |
| Kumba Iron Ore                                      |                  |               |           |                |                           |         |      |                  |                      |              |                      |
| Grand total Saleable Product                        |                  |               |           | 75.4           | Proved                    | 70.1    | 70.7 | 347.9            | 64.7                 | 367.4        | 64.7                 |
|   |                  |               |           |                | Probable                  |         |      | 184.3            | 61.2                 | 198.2        | 61.4                 |
|   |                  |               |           |                | Grand total               |         |      | 532.2            | 63.5                 | 565.6        | 63.5                 |

## Footnotes to Saleable Product (Table 4)

- The tonnages are quoted in dry metric tonnes and million tonnes is abbreviated as Mt.
- Rounding of figures may cause computational discrepancies.
- Saleable Product figures are reported at 100% irrespective of percentage attributable ownership to KIO.
- Yield is calculated as: Saleable Product tonnes (**Table 4**) / Ore Reserves tonnes (**Table 5**) x 100.

## Footnotes to Saleable Product (Table 4) explaining year-on-year differences

### 1 Kolomela's Saleable Product decreased by 7.6 Mt (-5%) from 2021 to 2022.

The overall decrease is a result of:

- an 8+4 forecasted annual production of 11.0 Mt (excluding depletion of modified beneficiated Inferred Mineral Resources)
- the reallocation of Ore Reserves to Mineral Resources associated with a decrease in the size of the Kapstevl South pit layout based on the 2022 pit optimisation, removing 18.1 Mt from the Saleable Product portfolio
- a minor 0.3 Mt decrease in Saleable Product due to a decrease in overall reserves as a result of a decrease in the mining recovery efficiency modifying factor as applied for the Kapstevl North pit at Kolomela mine from 83% in 2021 to 75% in 2022 to account for demonstrated performance in 2022

The total decrease of 29.4 Mt was offset by a 21.8 Mt increase, primarily as a result of:

- 10.5 Mt additional Saleable Product derived from the first-time addition of medium-grade material [mixture of *in situ* high-grade ore (Fe ≥ 61%) and BIF (Fe <50%), with resultant Fe ranging from 50% to less than 61%] Ore Reserves to the Kolomela 2022 LoAP
- geological model updates to account for additional borehole data, resulting in Inferred Mineral Resources being upgraded to Indicated and Measured Mineral Resources, the latter available for conversion to Ore Reserves, resulting in a 3.9 Mt increase in Saleable Product
- a 3.9 Mt increase associated with the assignment of a pit layout to the small Kapstevl North satellite deposit
- the 8+4 forecasted growth in run-of-mine buffer stockpile levels accounting for a 2.2 Mt increase in Saleable Product
- a 1.4 Mt correction to reconcile for the fact that the Q4 2021 production at Kolomela mine was 1.4 Mt less than forecasted at the time of reporting in 2021

The 1.7% (absolute) decrease in the average yield is the result of the change in the DSO : DMS plant feed ratio from 90 : 10 in 2021 to 86 : 14 in 2022, primarily as a result of the addition of medium-grade Ore Reserves scheduled as plant feed to the DMS plant, which operates at lower yields than the DSO plant.

For Kolomela a 12-year remaining reserve life, at an average 11.2 Mtpa (12.1 Mtpa for first six years and 10.3 Mtpa for last six years) scheduled Saleable Product (including modified beneficiated Inferred Mineral Resources) output has been quoted in 2022.

The Kolomela LoAP does contain periods where the standard Lump Saleable Product contaminant grades exceed the current Client product specifications. Further work is ongoing to fully align to the cut-off grade assignments and the latest ore blending potential assumptions. Kumba has tabled this matter on its marketing forum meetings and it is being resolved.

### 2 Sishen's Saleable Product decreased by 25.8 Mt (-6%) year-on-year.

The Sishen LoAP was not updated in 2022 and the 2022 Saleable Product estimate has been derived by depleting the 2021 LoAP with 25.9 Mt to account for the 8+4 forecasted production of 2022.

For Sishen, a 17-year reserve life, at an average 23.9 Mtpa (29.4 Mtpa for first 12 years and 10.7 Mtpa for last five years) scheduled Saleable Product (including modified beneficiated Inferred Mineral Resources) output has been quoted in 2022.

# Ore Reserves (and Saleable Product) cont.

The Sishen products are co-stockpiled with the Kolomela products at the Saldanha export port to deliver the following Saleable Products for the market:

Premium Lump:  $\geq 65.2\%$  Fe

Standard Lump: 63.6% Fe to 64.1% Fe

Standard Fines: 62.4% Fe to 63.7% Fe

The year-on-year change in the estimated Saleable Product is reconciled in Figure 10.

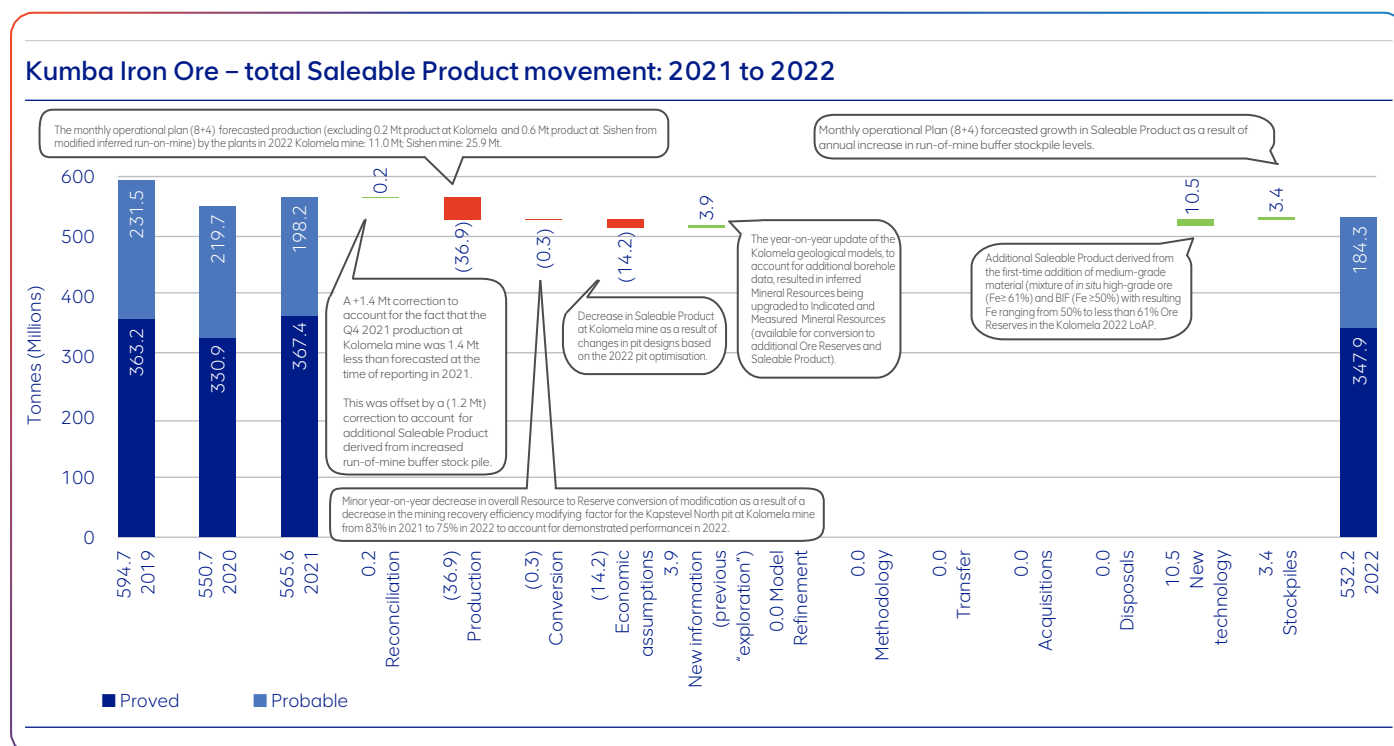


Figure 10: 2021 to 2022 movement in Kumba Saleable Product



## 2022 versus 2021 Ore Reserves

The 2022 Kolomela and Sishen LoAPs, considering the latest technical and business inputs, estimate the Ore Reserves (Proved and Probable portion of scheduled run-of-mine) at 759.4 Mt at an average 55.7% Fe over the mine life years for the two mining operations (Table 5).

**Table 5: Kumba's Ore Reserves for 2022 (referenced against 2021)**

| Operation/<br>Project                                     | Operation<br>status | Mining<br>method | Ore type  | % owned<br>by KIO | Reserve<br>category | Ore Reserves    |                            |                             |                              |                 |                            |                             |                              |
|---|---------------------|------------------|-----------|-------------------|---------------------|-----------------|----------------------------|-----------------------------|------------------------------|-----------------|----------------------------|-----------------------------|------------------------------|
|   |                     |                  |           |                   |                     | 2022            |                            |                             |                              | 2021            |                            |                             |                              |
|   |                     |                  |           |                   |                     | Tonnage<br>(Mt) | Average<br>Grade<br>(% Fe) | Grade<br>Cut-off*<br>(% Fe) | Reserve<br>life**<br>(Years) | Tonnage<br>(Mt) | Average<br>Grade<br>(% Fe) | Grade<br>Cut-off*<br>(% Fe) | Reserve<br>life**<br>(Years) |
| Mining operations   |                     |                  |           |                   |                     |                 |                            |                             |                              |                 |                            |                             |                              |
| Kolomela <sup>1</sup>                                     |                     |                  |           |                   |                     |                 |                            |                             |                              |                 |                            |                             |                              |
| Ore Reserves<br>from pit                                  | Steady-state        | Open-pit         | Haematite | 75.4              | Proved              | 97.9            | 63.8                       | 50.0                        | 12                           | 102.0           | 63.8                       | 50.0                        | 13                           |
|   |                     |                  |           |                   | Probable            | 21.8            | 63.5                       |                             |                              | 33.0            | 63.3                       |                             |                              |
|   |                     |                  |           |                   | Sub-total           | 119.6           | 63.7                       |                             |                              | 135.0           | 63.7                       |                             |                              |
| Ore Reserves<br>from run-of-<br>mine buffer<br>stockpiles |                     |                  |           |                   | Proved              | 0.0             | 0.0                        |                             |                              | 0.0             | 0.0                        |                             |                              |
|   |                     |                  |           |                   | Probable            | 21.4            | 61.1                       |                             |                              | 11.5            | 63.3                       |                             |                              |
|   |                     |                  |           |                   | Sub-total           | 21.4            | 61.1                       |                             |                              | 11.5            | 63.3                       |                             |                              |
| Total<br>Ore Reserves                                     |                     |                  |           |                   | Proved              | 97.9            | 63.8                       |                             |                              | 102.0           | 63.8                       |                             |                              |
|   |                     |                  |           |                   | Probable            | 43.2            | 62.3                       |                             |                              | 44.6            | 63.3                       |                             |                              |
|   |                     |                  |           |                   | Total               | 141.1           | 63.3                       |                             |                              | 146.5           | 63.6                       |                             |                              |
| Sishen <sup>2</sup>                                       |                     |                  |           |                   |                     |                 |                            |                             |                              |                 |                            |                             |                              |
| Ore Reserves<br>from pit                                  | Steady-state        | Open-pit         | Haematite | 75.4              | Proved              | 364.9           | 57.6                       | 40.0                        | 17                           | 384.9           | 57.6                       | 40.0                        | 18                           |
|   |                     |                  |           |                   | Probable            | 192.8           | 47.7                       |                             |                              | 211.3           | 48.9                       |                             |                              |
|   |                     |                  |           |                   | Sub-total           | 557.7           | 54.2                       |                             |                              | 596.2           | 54.5                       |                             |                              |
| Ore Reserves<br>from run-of-<br>mine buffer<br>stockpiles |                     |                  |           |                   | Proved              | 0.0             | 0.0                        |                             |                              | 0.0             | 0.0                        |                             |                              |
|   |                     |                  |           |                   | Probable            | 60.7            | 52.3                       |                             |                              | 57.2            | 48.3                       |                             |                              |
|   |                     |                  |           |                   | Sub-total           | 60.7            | 52.3                       |                             |                              | 57.2            | 48.3                       |                             |                              |
| Total<br>Ore Reserves                                     |                     |                  |           |                   | Proved              | 364.9           | 57.6                       |                             |                              | 384.9           | 57.6                       |                             |                              |
|   |                     |                  |           |                   | Probable            | 253.5           | 48.8                       |                             |                              | 268.5           | 48.8                       |                             |                              |
|   |                     |                  |           |                   | Total               | 618.4           | 54.0                       |                             |                              | 653.4           | 54.0                       |                             |                              |
| Company   |                     |                  |           |                   |                     |                 |                            |                             |                              |                 |                            |                             |                              |
| Kumba Iron Ore  |                     |                  |           |                   |                     |                 |                            |                             |                              |                 |                            |                             |                              |
| Grand total<br>Ore Reserves                               |                     |                  |           | 75.4              | Proved              | 462.8           | 58.9                       |                             |                              | 486.9           | 58.9                       |                             |                              |
|   |                     |                  |           |                   | Probable            | 296.7           | 50.8                       |                             |                              | 313.0           | 50.9                       |                             |                              |
|   |                     |                  |           |                   | Grand total         | 759.4           | 55.7                       |                             |                              | 799.9           | 55.8                       |                             |                              |

### Footnotes to the Ore Reserves (Table 5)

- The tonnages are quoted in dry metric tonnes and million tonnes is abbreviated as Mt.
- Rounding of figures may cause computational discrepancies.
- Ore Reserve figures are reported at 100% irrespective of percentage attributable ownership to KIO.
- \* The cut-off grade assigned to Ore Reserves is variable and is dependent on the beneficiability and/or blending capacity of the modified ore scheduled as run-of-mine, which is iteratively determined during LoAP scheduling to achieve a grade target that is set to meet the Client product specifications. The % Fe cut-off illustrated is therefore the lowest of a range of variable cut-offs for the various mining areas.
- \*\* Reserve life represents the period in years in the approved LoAP for the scheduled extraction of Proved and Probable Ore Reserves. The reserve life is limited to the period during which the Ore Reserves can be economically exploited. Where the scheduled Ore Reserves fall below 25% of the average annual production rate, the period beyond this is excluded from the reserve life. The reserve life also does not exceed the security of tenure expiry date.

### Footnotes to the Ore Reserves (Table 5) – summarising reserve life

- For Kolomela, a 12-year remaining reserve life, at an average 11.8 Mtpa (12.8 Mtpa for the first six years and 10.9 Mtpa for the last eight years) scheduled plant feed (including modified Inferred Mineral Resources) has been quoted in 2022.  
To define the risk of having low-confidence modified Inferred Mineral Resources in the LoAP, Kolomela valued a long-term asset plan scheduling scenario, excluding the modified Inferred Mineral Resources. The plan remained economically viable, although at a 10% lower NPV (at an 8% real discount rate).
- For Sishen, a 17-year reserve life, at an average 37.0 Mtpa (40.2 Mtpa for the first 12 years and 29.3 Mtpa for the last five years) scheduled plant feed (including modified beneficiated Inferred Mineral Resources) has been quoted in 2022.  
To define the risk of having low-confidence modified Inferred Mineral Resources in the LoAP, Sishen mine valued a long-term asset plan scheduling scenario, excluding the modified Inferred Mineral Resources. The plan remained economically viable, although at a 2% lower NPV (at an 8% real discount).

# Ore Reserves (and Saleable Product) cont.

## Footnotes to Ore Reserves (Table 5) – explaining annual Ore Reserve differences

### 1 Kolomela realised a year-on-year net decrease in Ore Reserves of 5.5 Mt (-4%).

The overall decrease is primarily a result of:

- annual Ore Reserve depletion of -11.5 Mt, i.e. monthly operational plan 8+4 forecasted run-of-mine (excluding depletion of modified Inferred Mineral Resources) for 2022
- the reallocation of 18.9 Mt Ore Reserves to Mineral Resources due to the outcome of the 2022 pit optimisation, which resulted in a decrease in the size of the Kapstevl South pit layout
- a minor 0.3 Mt decrease in the overall conversion of resources to reserves with the adjustment of the Kapstevl North pit mining recovery efficiency modifying factor from 83% as per the 2021 LoAP to 75% as per the 2022 LoAP to meet the actual mining recovery efficiencies as realised for this pit and recorded in the 2022 value chain reconciliation

The overall 30.7 Mt decrease was partially offset by:

- a 13.5 Mt year-on-year increase in Ore Reserves associated with the first-time addition of medium-grade [mixture of *in situ* high-grade ore (Fe ≥ 61%) and BIF (Fe < 50%) with resultant Fe ranging from 50% to less than 61%] Ore Reserves to the Kolomela 2022 LoAP
- geological model updates considering the latest available borehole information resulting in a 4.1 Mt increase in Ore Reserves, primarily as a result of an increase in the confidence in geological estimates resulting in Inferred Mineral Resources being converted to Indicated and Measured Mineral Resources, available for conversion to Ore Reserves
- a 3.9 Mt increase in Ore Reserves associated with the assignment of a pit layout to the small Kapstevl North satellite deposit
- the monthly operational plan 8+4 forecasted increase in run-of-mine buffer stockpile levels of 2.2 Mt
- a correction of 1.4 Mt to reconcile for the over reporting of run-of-mine production in Q4 2021

The 0.3% (absolute) year-on-year decrease in the average Ore Reserve Fe grade is the result of the first-time inclusion of the medium-grade (high-grade ore diluted with ferruginised BIF) material in the Ore Reserve portfolio.

The overall waste stripping ratio decreased from 4.5 : 1 in 2021 to 4.4 : 1 in 2022, primarily as a result of the pit layout changes.

In the case of the Kolomela mining operation, the Ore Reserve reference point is the primary crusher feeders where the planned run-of-mine is delivered to either the crushing and screening plant (where DSO is produced), or the small-scale DMS plant.

### 2 Sishen mine's Ore Reserves decreased by 35.0 Mt (-5%) year-on-year.

The Sishen LoAP was not updated in 2022 and the 2022 Ore Reserve estimate has been derived by depleting the 2021 LoAP with 35.0 Mt to account for the 8+4 forecasted production of 2022.

In the case of the Sishen mining operation the Ore Reserve reference point is the primary crusher feeders where the planned run-of-mine is delivered to either the DMS plant or the Jig (plus small-scale UHDS) plant.

The Proved portion of the low-grade Ore Reserves has been downgraded to Probable Ore Reserves as the plant feed in the 2021 LoAP originates from run-of-mine buffer stockpiles (low-grade ex-pit ore is hauled to stockpiles before beneficiation), and it is protocol in Kumba to assign a Probable confidence to stockpiled material as grade estimates thereof are based on averages.

The overall waste stripping ratio remained unchanged at 3.3 : 1.

## The year-on-year change in the estimated Ore Reserves is reconciled in Figure 11.

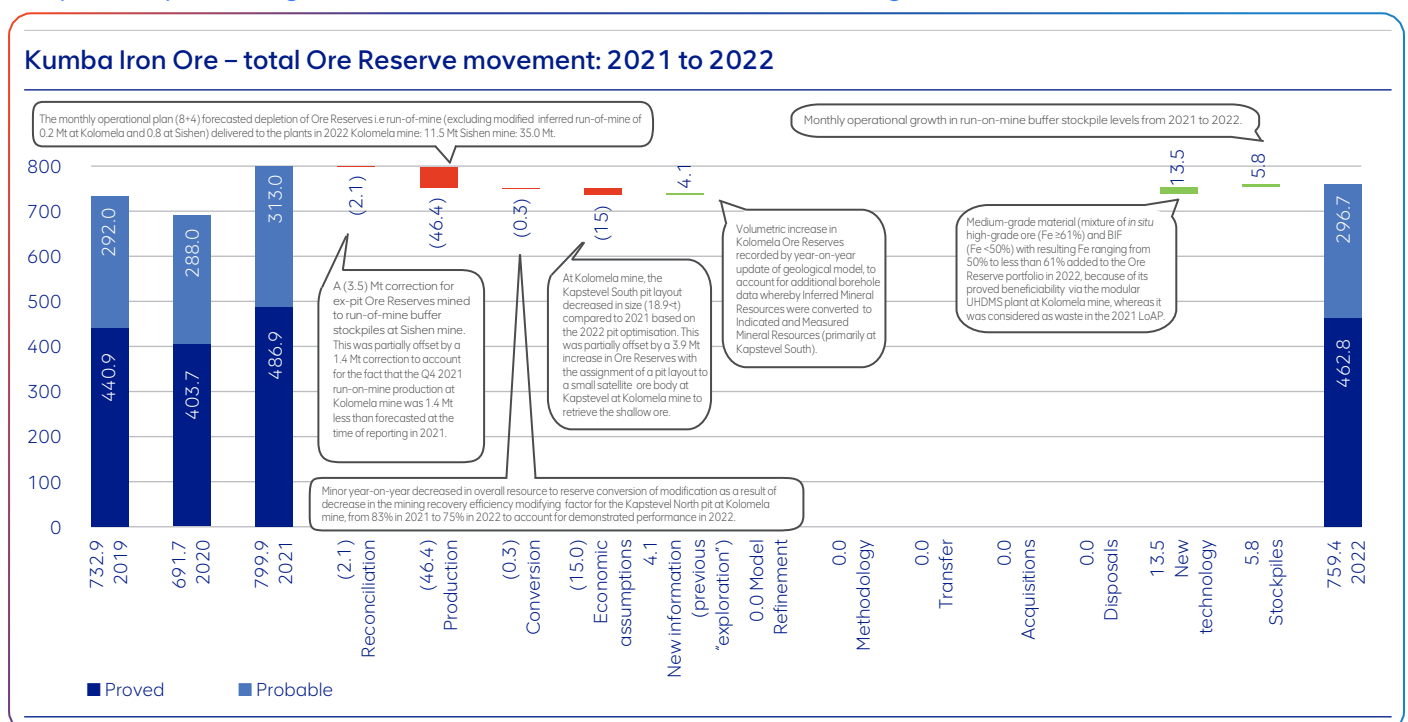


Figure 11: 2021 to 2022 movement in Kumba Ore Reserves

# Exclusive Mineral Resources

The ore in addition to Ore Reserves, with Kumba's strategic focus to improve resource utilisation, and to continue exploration by advancing in-house project studies and technology development as well as to form partnerships with other role players in an attempt to convert its Mineral Resources to Ore Reserves and to expand its Mineral Resource base in the Northern Cape. It must be noted that only a portion of the current exclusive Mineral Resource portfolio can be converted to Ore Reserves by achieving improved resource utilisation targets; conversion of the rest is dependent on an increase in Kumba's long-term iron ore price outlook, thus market related.

## Exploration

Kumba Iron Ore primarily conducted on-mine exploration in 2022 to refine the characterisation of existing Mineral Resources associated within actively mined pits as well as to improve the geological confidence of satellite deposit Mineral Resources within mining right areas not associated with actively mined pits. The focus of the on-mine exploration has also shifted to cater for more large-diameter core drilling to generate spatial geometallurgical information to better inform the conversion of Ore Reserves to Saleable Product in the future.

Near-mine exploration for 2022 continued in areas in the Northern Cape province outside the SIOC mining right areas, in association with third-party prospecting right holders for areas

that have been identified as potential iron ore mineralisation targets via the Kumba regional geological model of the iron ore belt. Through exploration drilling and analyses and geometallurgical test work, Kumba has advanced one such opportunity (small deposit located south of Sishen mine) to a confidence level where our JV partner could submit a mining right application, which is currently under consideration by the DMRE.

## Exploration expenditure

Exploration drilling activities realised 58,194 drill meters in 2022. The associated total exploration spent amounted to R297.9 million (**Table 6**). The 2022 exploration expenditure comprises 0.4% of KIO's 2022 revenue.

**Table 6:** Summary of 2022 versus 2021 Kumba exploration expenditure (8+4 forecast)

|                                     | Total exploration spend<br>x million |        | Drilling spend<br>x million |        | Number of holes drilled |      | Metres drilled |        | Average drilling cost per metre |           |
|-------------------------------------|--------------------------------------|--------|-----------------------------|--------|-------------------------|------|----------------|--------|---------------------------------|-----------|
|                                     | 2022                                 | 2021   | 2022                        | 2021   | 2022                    | 2021 | 2022           | 2021   | 2022                            | 2021      |
| Mining right areas                  | R232.4                               | R257.0 | R178.6                      | R211.2 | 263                     | 228  | 45,562         | 44,640 | R3,919.02                       | R4,730.41 |
| Third-party prospecting right areas | R65.5                                | R97.2  | R58.8                       | R86.0  | 47                      | 75   | 12,633         | 15,186 | R4,652.01                       | R5,661.72 |
| Total                               | R297.9                               | R354.2 | R237.3                      | R297.1 | 310                     | 303  | 58,194         | 59,826 | R4,078.13                       | R4,966.81 |

The exploration costs as set out in the table above are the combined costs associated with the various types of core, reverse circulation and percussion drilling that were conducted in 2022.

# Exclusive Mineral Resources cont.

## Sampling and assaying

All primary geological samples taken from drilled core (and in some instances RC drilling and percussion drilled chips) via normal exploration drilling at all the relevant Kumba sites in 2022 were prepared and assayed by the Chemistry Laboratory (Company registration number: 1921/0067130/06) of the Technical Solutions Division of AA plc (TS of AA plc).

All samples taken from drilled core of dedicated geometallurgical boreholes were prepared and tested for an array of metallurgical and other physical property measurements by the Metallurgical Laboratory of the TS of AA plc, with subsequent assaying of these samples conducted by the AA plc Chemistry Laboratory.

The TS Chemistry Laboratory is accredited in accordance with the recognised International Standard ISO/IEC 17025:2005 by the South African National Accreditation System (SANAS) under the facility accreditation number T0051 (valid until 30 April 2026) for the preparation and assaying of iron ore samples, applying methods that comply with the requirements of KIO.

As per the 8+4 forecast, Kumba Geosciences submitted 13,879 exploration borehole samples in 2022 to the TS Chemistry Laboratory to be prepared and analysed. In addition, 2,640 large-diameter borehole samples were submitted to the TS Metallurgical Laboratory to be prepared and tested. A total of 16,519 primary samples were submitted to the TS Chemistry and TS Metallurgical laboratories. The Chemistry Laboratory prepared 20,880 samples (including a backlog of samples from 2021) and assayed 22,343 samples (including a backlog of samples from 2021) for the year. Differences between submitted versus prepared and assayed samples are primarily because of a backlog of samples carried over from 2021 as well as additional QC samples (5% coarse and 5% pulp duplicates with 5% blind matrix-matched certified reference materials counting as a primary sample) as required by the Kumba Geosciences QA/QC protocol.

All the primary exploration samples were prepared, assayed and tested in the Republic of South Africa except for a total of 5% pulp replicate QC samples generated by the TS Chemistry Laboratory, which were analysed by the Bureau Veritas Laboratory in Perth, Australia, an ISO and National (Australian) Association of Testing Authorities accredited laboratory for iron ores and a member of the ISO MN-002-02 Chemical Analysis Committee, as part of the Kumba Geosciences Department's required external independent QA/QC validation.

The TS Metallurgical Laboratory prepared 2,700 samples in 2022 (including backlog of samples from 2021). The samples were then composited based on lithology and chemistry to obtain minimum masses as required by certain geometallurgical tests. Geometallurgical test work conducted involved:

- 640 bulk density Archimedes tests
- 116 geotechnical hardness tests
- 236 comminution-related tests
- 184 densimetric tests
- 200 mineralogy tests
- 114 refinement (Lump ore value-in-use) tests

The 2022 (8 actual +4 forecast) spend on sample preparation and assaying at the AA plc TS Chemistry laboratory amounted to R37.5 million (13% of total exploration expenditure). The 2022 (8 actual +4 forecast) spend on sample preparation and metallurgical testing at the AA plc TS Metallurgical Laboratory in 2022 amounted to R23.1 million (8% of total exploration expenditure).

Kumba ensures sample representativity by means of applying a stringent QA/QC protocol [*KIO Exploration Drilling Guideline and associated QC Protocol for Drilling, Sampling, Sub-sampling and Assaying (Version 10)*] that governs all stages of sampling, sub-sampling and assaying, including blind validation of the sample preparation and assaying of laboratories. The results of this validation are summarised in the annual Kumba QA/QC report, which is compiled and made available in-house at the end of October of each year in support of the annual Reserve and Resource report.



In addition, the Anglo American Technical Solutions Chemistry and Metallurgical Laboratories also apply their own internal QA/QC protocols and provide feedback to Kumba in the form of a detailed quarterly report. Kumba's Geosciences Department does however not add much value to round-robin results as it does not consider sampling preparation errors and the laboratories participating are aware of the fact that they are monitored and take special care in analysing round-robin samples. Previous blind monitoring has shown that accredited laboratories fail Kumba Geosciences' certified reference material control limit criteria with large margins.

Kumba has changed its densimetric test work method for coarse sub-samples from sink-float analysis to Rhovol testing, applying new technology developed by *DebTech* after the method was validated. This is a more cost and time-effective test method to determine fractional densities compared to sink-float analysis, which most importantly eliminates the use of hazardous fluids.



Rhovol densimetric measurement system (equipment purchased from DebTech to replace conventional sink-float analysis)

# Exclusive Mineral Resources cont.

## Mineral Resource estimation

Kumba applies a uniform Mineral Resource estimation process at all its sites as explained below.

| Process step               | Explanation   | Software                                  |
|----------------------------|---|---|
| Data assembly and quality  | The data generated by exploration, primarily drilling, must be representative of the volume of material being sampled. Samples are generated through quasi regular sampling (drilling) grids and are validated by means of a stringent quality control programme, which blindly monitors sample location, primary sampling, sample preparation and sample assaying. Because some of the historically drilled samples used for estimation do not have QA/QC metadata, Kumba introduced a sample representivity indexing method, which is considered during spatial geological confidence classification.   | acquire™                                  |
|                            | Validated exploration data is used to compile spatially referenced 3D tectonostratigraphic models based on the geologists' understanding and interpretation of the regional and local geology and ore genesis.  |   |
| Solids modelling           | The solids model geometrically domains the various iron ore types in relation to the waste lithologies, within primary structural domains. Because of the pervasive nature of the iron ore mineralisation in the Northern Cape province of South Africa, Kumba has to compile full 3D solids models and ferruginisation is often of such a nature that lower-grade ore domains are distinguished from waste and higher-grade ore applying soft boundaries or Fe cut-off grades.   | Seequent Leapfrog Geo™ and GEOVIA Surpac™ |
|                            | Each domain's bounding surface in effect provides an efficient volume description of the tectonostratigraphic unit.   |   |
| Exploratory data analysis  | The validated borehole grade data intersecting the various solids model domains is statistically analysed through univariate and multivariate statistical methods to understand its distributions and relations and to identify outliers.   | JMP™                                      |
|                            | Thereafter, the data is composited to achieve constant sample support, and again statistically analysed per domain and sub-domaining based on grade is conducted if different populations within a single solids domain can be spatially distinguished.   |   |
| Geological block modelling | Iron ore is a typical multivariate grade commodity and Kumba geostatistically models composited sample density and the following composited sample grade parameters of the ore domains as a minimum, i.e. Fe, SiO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , K <sub>2</sub> O and P to establish its spatial variability. Generally, co-variograms are modelled for correlated variables (Fe, SiO <sub>2</sub> and density) and conventional variograms for the other variables. These calculations are done using unfolded data. The variograms are interpreted to consider spatial anisotropy. Waste lithologies, by virtue of having a poorer sample coverage, are usually characterised by default grades and densities, statistically derived from the sample data.   | Isatis™                                   |
|                            | The optimal parent block size is determined using Quantitative Kriging Neighbourhood Analysis.  |   |
|                            | A Quantitative Kriging Neighbourhood Analysis is used to determine the best search plan (number of samples and ranges) by optimising the Krige variance and slope-of-regression while minimising negative weights in the Krige matrix.  |   |
|                            | Ordinary Kriging or Ordinary Co-Kriging are conducted to estimate the attributes where the data density is sufficient. Generally Ordinary Co-Kriging is used to estimate the correlated variables although Ordinary Kriging may be used if necessary. In areas with sparse sampling, Simple Kriging is applied or default values (global estimates) are assigned.<br><br>The block grades are informed during three rounds of interpolation. In the first-round block grades are estimated using the optimal Kriging neighbourhood. This represents the best possible estimates. Blocks not estimated in the first pass are then kriged using an enlarged (*2) neighbourhood. These estimates thus use sample beyond the range of the variogram and are extrapolated and of a lower quality. Any blocks still not informed receive the global mean grade. This process is repeated for each variable. | Isatis™, GEOVIA Surpac™, DataMine Studio™ |
| Confidence classification  | Kumba applies a scorecard approach whereby certain key site-specific parameters as identified by the CP, are indexed and used to measure geometry and grade continuity. Each block within the geological block model is populated with these indices. The individual grade indices and geometry indices are then weighted as per the CP's understanding of its impact. The weights are applied to derive a combined grade index as well as a combined geometry index, which in turn is weighted, as per the CP's understanding of the deposit to derive a final single geological confidence index. The final confidence index is then classed against index boundaries as derived by the CP to distinguish between Measured, Indicated and Inferred Mineral Resources. The CP also has the authority to override areas of indexed classification and downgrade it.                                   | Isatis™, GEOVIA Surpac™, DataMine Studio™ |
| Resource reporting         | Inclusive Mineral Resources are determined as that portion of the ore in the 3D geological block model that has <i>in situ</i> grades above the Fe cut-off grade (derived from beneficiation potential), that are located within the 1.6 revenue factor resource shell (as derived through pit optimisation). Only that portion of the inclusive Mineral Resources which are not converted to Ore Reserves (everything inside the resource shell above the specified cut-off grades, excluding the Measured and Indicated Mineral Resources inside the pit layout converted to Ore Reserves) are reported as exclusive Mineral Resources.   |   |

## Reasonable prospects for eventual economic extraction

KIO's 2022 Mineral Resources are not an inventory of all mineral occurrences drilled or sampled regardless of cut-off grade, likely dimensions, location, depth or continuity. Instead, they are a realistic record of those, which under assumed and justifiable technical and economic conditions, may be economically extractable in future.

Apart from cut-off grades, which consider the current or at least concept-approved beneficiation processes, Kumba spatially distinguishes Mineral Resources from other mineral occurrences by applying a resource shell (1.6 x revenue factor shell). This is derived during the pit optimisation process conducted on the latest site-specific 3D mining block models, considering SMU and mining bench configurations, etc. The resource shell is then subsequently applied to the geological block models, defining the classified ore occurring inside the resource shell as the resultant inclusive Mineral Resource portion considered to have RPEEE.

A further condition is that the iron ore price corresponding with a 1.6 revenue factor pit shell must have been historically achieved

in the global iron ore market. This process, therefore, considers site-specific beneficiation, mining practices as well as realistic pricing and cost.

The inclusive Mineral Resources are therefore the mineralisation at an Fe cut-off grade (50% for Kolomela and 40% for Sishen), occurring inside the 1.6 revenue factor resource shell.

By implication, all inclusive Mineral Resources are therefore 3D modelled with an associated geological confidence classification, which spatially defines the confidence in the Mineral Resource tonnage and grade estimates.

For Mineral Resource reporting purposes, Kumba, under the direction of the Anglo American group, prefers to report Mineral Resources exclusive of Ore Reserves, in other words, all the Measured and Indicated inclusive Mineral Resources occurring inside the pit layout derived from a 1.0 revenue factor pit shell (converted to Ore Reserves) are not reported as part of the exclusive Mineral Resources.

The Kumba Mineral Resources (in addition to Ore Reserves) for 2022 (referenced against 2021) are detailed in **Table 7**.

## 2022 versus 2021 exclusive Mineral Resources

**Table 7:** Kumba's exclusive Mineral Resources for 2022 (referenced against 2021)

| Operation/<br>project   | Ore<br>type | % owned<br>by KIO | Resource category                     | 2022            |                   |                   | 2021            |                 |                   |
|---|-------------|-------------------|---------------------------------------|-----------------|-------------------|-------------------|-----------------|-----------------|-------------------|
|   |             |                   |                                       | Tonnage<br>(Mt) | Average<br>(% Fe) | % Fe<br>Cut-off** | Tonnage<br>(Mt) | Average<br>% Fe | % Fe<br>Cut-off** |
| Mining operations   |             |                   |                                       |                 |                   |                   |                 |                 |                   |
| Kolomela <sup>1</sup>   |             |                   |                                       |                 |                   |                   |                 |                 |                   |
| In situ Mineral<br>Resources<br>(in addition to<br>Ore Reserves)                    | Haematite   | 75.4              | Measured (outside LoAP)               | 52.1            | 65.1              | 50.0              | 30.5            | 64.8            | 50.0              |
|   |             |                   | Indicated (outside LoAP)              | 62.1            | 63.1              |                   | 59.8            | 63.1            |                   |
|   |             |                   | Measured and Indicated (outside LoAP) | 114.2           | 64.0              |                   | 90.4            | 63.7            |                   |
|   |             |                   | Inferred (considered in LoAP)         | 1.2             | 64.7              |                   | 6.6             | 64.8            |                   |
|   |             |                   | Inferred (outside LoAP)               | 17.4            | 62.5              |                   | 23.8            | 63.1            |                   |
|   |             |                   | Total Inferred                        | 18.6            | 62.6              |                   | 30.4            | 63.5            |                   |
|   |             |                   | Sub-total                             | 132.8           | 63.8              |                   | 120.7           | 63.6            |                   |
| Long-term<br>stockpiled<br>Mineral<br>Resources<br>(in addition to<br>Ore Reserves) | Haematite   | 75.4              | Measured (outside LoAP)               | 0.0             | 0.0               | 50.0              | 0.0             | 0.0             | 50.0              |
|   |             |                   | Indicated (outside LoAP)              | 0.0             | 0.0               |                   | 8.7             | 55.2            |                   |
|   |             |                   | Measured and Indicated (outside LoAP) | 0.0             | 0.0               |                   | 8.7             | 55.2            |                   |
|   |             |                   | Inferred (considered in LoAP)         | 0.0             | 0.0               |                   | 0.0             | 0.0             |                   |
|   |             |                   | Inferred (outside LoAP)               | 0.0             | 0.0               |                   | 0.0             | 0.0             |                   |
|   |             |                   | Total Inferred                        | 0.0             | 0.0               |                   | 0.0             | 0.0             |                   |
|   |             |                   | Sub-total                             | 0.0             | 0.0               |                   | 8.7             | 55.2            |                   |
| Total Mineral<br>Resources<br>(in addition to<br>Ore Reserves)                      | Haematite   | 75.4              | Measured (outside LoAP)               | 52.1            | 65.1              | 50.0              | 30.5            | 64.8            | 50.0              |
|   |             |                   | Indicated (outside LoAP)              | 62.1            | 63.1              |                   | 68.5            | 62.1            |                   |
|   |             |                   | Measured and Indicated (outside LoAP) | 114.2           | 64.0              |                   | 99.1            | 62.9            |                   |
|   |             |                   | Inferred (considered in LoAP)         | 1.2             | 64.7              |                   | 6.6             | 64.8            |                   |
|   |             |                   | Inferred (outside LoAP)               | 17.4            | 62.5              |                   | 23.8            | 63.1            |                   |
|   |             |                   | Total Inferred                        | 18.6            | 62.6              |                   | 30.4            | 63.5            |                   |
|   |             |                   | Sub-total                             | 132.8           | 63.8              |                   | 129.4           | 63.0            |                   |

# Exclusive Mineral Resources cont.

Table 7 (continued): Kumba's exclusive Mineral Resources for 2022 (referenced against 2021)

| Operation/<br>project   | Ore<br>type | % owned<br>by KIO | Resource category                     | 2022            |                   |                   | 2021            |                 |                   |
|---|-------------|-------------------|---------------------------------------|-----------------|-------------------|-------------------|-----------------|-----------------|-------------------|
|   |             |                   |                                       | Tonnage<br>(Mt) | Average<br>(% Fe) | % Fe<br>Cut-off** | Tonnage<br>(Mt) | Average<br>% Fe | % Fe<br>Cut-off** |
| Sishen <sup>2</sup>   |             |                   |                                       |                 |                   |                   |                 |                 |                   |
| In situ Mineral<br>Resources<br><br>(in addition to<br>Ore Reserves)                    | Haematite   | 75.4              | Measured (outside LoAP)               | 175.3           | 59.4              | 40.0              | 176.7           | 59.4            | 40.0              |
|   |             |                   | Indicated (outside LoAP)              | 222.2           | 55.4              |                   | 222.4           | 55.4            |                   |
|   |             |                   | Measured and Indicated (outside LoAP) | 397.4           | 57.2              |                   | 399.2           | 57.2            |                   |
|   |             |                   | Inferred (considered in LoAP)         | 11.7            | 50.6              |                   | 12.6            | 50.8            |                   |
|   |             |                   | Inferred (outside LoAP)               | 24.4            | 56.7              |                   | 24.6            | 56.7            |                   |
|   |             |                   | Total Inferred                        | 36.1            | 54.7              |                   | 37.2            | 54.7            |                   |
|   |             |                   | Sub-total                             | 433.5           | 57.0              |                   | 436.3           | 57.0            |                   |
| Long-term<br>stockpiled<br>Mineral<br>Resources<br><br>(in addition to<br>Ore Reserves) | Haematite   | 75.4              | Measured (outside LoAP)               | 0.0             | 0.0               | 40.0              | 0.0             | 0.0             | 40.0              |
|   |             |                   | Indicated (outside LoAP)              | 0.0             | 0.0               |                   | 0.0             | 0.0             |                   |
|   |             |                   | Measured and Indicated (outside LoAP) | 0.0             | 0.0               |                   | 0.0             | 0.0             |                   |
|   |             |                   | Inferred (considered in LoAP)         | 0.0             | 0.0               |                   | 0.0             | 0.0             |                   |
|   |             |                   | Inferred (outside LoAP)               | 0.0             | 0.0               |                   | 0.0             | 0.0             |                   |
|   |             |                   | Total Inferred                        | 0.0             | 0.0               |                   | 0.0             | 0.0             |                   |
|   |             |                   | Sub-total                             | 0.0             | 0.0               |                   | 0.0             | 0.0             |                   |
| Total Mineral<br>Resources<br><br>(in addition to<br>Ore Reserves)                      | Haematite   | 75.4              | Measured (outside LoAP)               | 175.3           | 59.4              | 40.0              | 176.7           | 59.4            | 40.0              |
|   |             |                   | Indicated (outside LoAP)              | 222.2           | 55.4              |                   | 222.4           | 55.4            |                   |
|   |             |                   | Measured and Indicated (outside LoAP) | 397.4           | 57.2              |                   | 399.2           | 57.2            |                   |
|   |             |                   | Inferred (considered in LoAP)         | 11.7            | 50.6              |                   | 12.6            | 50.8            |                   |
|   |             |                   | Inferred (outside LoAP)               | 24.4            | 56.7              |                   | 24.6            | 56.7            |                   |
|   |             |                   | Total Inferred                        | 36.1            | 54.7              |                   | 37.2            | 54.7            |                   |
|   |             |                   | Sub-total                             | 433.5           | 57.0              |                   | 436.3           | 57.0            |                   |
| Company   |             |                   |                                       |                 |                   |                   |                 |                 |                   |
| Kumba Iron Ore  |             |                   |                                       |                 |                   |                   |                 |                 |                   |
| Grand total<br>Mineral<br>Resources<br><br>(in addition to<br>Ore Reserves)             | Haematite   | 75.4              | Measured (outside LoAP)               | 227.4           | 60.7              | 40.0              | 207.3           | 60.2            | 40.0              |
|   |             |                   | Indicated (outside LoAP)              | 284.2           | 57.1              |                   | 291.0           | 57.0            |                   |
|   |             |                   | Measured and Indicated (outside LoAP) | 511.6           | 58.7              |                   | 498.2           | 58.3            |                   |
|   |             |                   | Inferred (considered in LoAP)         | 12.9            | 51.9              |                   | 19.2            | 55.6            |                   |
|   |             |                   | Inferred (outside LoAP)               | 41.8            | 59.1              |                   | 48.3            | 59.8            |                   |
|   |             |                   | Total Inferred                        | 54.7            | 57.4              |                   | 67.5            | 58.6            |                   |
|   |             |                   | Total                                 | 566.3           | 58.6              |                   | 565.8           | 58.3            |                   |

## Footnotes to the exclusive Mineral Resources (Table 7)

- The tonnages are quoted in dry metric tonnes and million tonnes is abbreviated as Mt.
- Rounding of figures may cause computational discrepancies.
- Mineral Resource figures are reported at 100% irrespective of percentage attributable KIO ownership.
- The term Inferred Mineral Resource (outside LoAP) refers to that portion of the Inferred Mineral Resources not utilised in the LoAP.
- The term Inferred Mineral Resource (considered for LoAP) refers to that portion of the Inferred Mineral Resources utilised in the LoAP; reported without having any modifying factors applied – therefore the term “considered for LoAP” instead of “inside LoAP”.
- While it would be reasonable to expect that the majority of Inferred Mineral Resources would upgrade in confidence to Indicated Mineral Resources with continued exploration, due to the uncertainty of Inferred Mineral Resources, it should not be assumed that such upgrading will always occur on a one-to-one basis.

\*\*The cut-off grade quoted for each of the Kumba sites is a fixed *in situ* Fe percentage.



## Footnotes to exclusive Mineral Resources (Table 7) explaining year-on-year differences:

### 1 Kolomela quotes a 3.3 Mt (+3%) increase in exclusive Mineral Resources from 2021 to 2022.

An overall increase was the result of:

- a decrease in the size of the Kapstevl South pit layout based on the 2022 pit optimisation, which resulted in an 18.9 Mt increase in Measured and Indicated Mineral Resources being reallocated from Ore Reserves
- a reconciliation adjustment of +0.1 Mt to account for less Inferred Mineral resources depleted in Q4 of 2021 than forecasted for the period at the time of reporting in 2021

The increase was partially offset by:

- an 8.7 Mt decrease as a result of the long-term stockpiled medium-grade Mineral Resources being converted to Ore Reserves
- the conversion of 4.0 Mt of Mineral Resources as defined for the Kapstevl North satellite deposit to Ore Reserves with the assignment of a pit layout in 2022
- minor (-2.8 Mt) volumetric changes recorded by the annual geological model updates to incorporate additional borehole data
- the 8+4 forecasted depletion of Inferred Mineral Resources inside the pit layout (-0.2 Mt)

Of the 17.4 Mt Inferred Mineral Resources (outside the LoAP), 8.3 Mt is extrapolated. None of the Inferred Mineral Resources inside the 2022 LoAP are extrapolated.

The average *in situ* Fe of the exclusive Mineral Resources increased by 0.8% (absolute) year-on-year, primarily as a result of the conversion of the long-term stockpiled medium-grade Mineral Resources to Ore Reserves.

### 2 The Sishen exclusive Mineral Resources showed a 1% decrease of -2.8 Mt year-on-year.

The forecasted 8+4 depletion of Mineral Resources in 2022 was calculated by applying the actual surveyed 31 December 2021 pit topography (as a top cut) and combining the 31 August 2022 surveyed pit topography plus monthly operational plan (MOP) 8+4 planned mining volumes for 1 September to 31 December 2022 (as a bottom cut) to the 2021 geological block model. The 2021 geological block model was used for the 2022 Mineral Resource estimate to align with the fact that the 2021 LoAP was used to estimate the 2022 Ore Reserves. The MOP 8+4 is used to distinguish the ratio between Mineral Resources utilised as run-of-mine (0.9 Mt unmodified, which equates to 0.8 Mt if modified into run-of-mine) and those forwarded to run-of-mine buffer stockpiles (1.9 Mt) in 2022.

Of the 24.4 Mt Inferred Mineral Resources (outside the LoAP), 7.3 Mt is extrapolated. None of the Inferred Mineral Resources inside the 2021 LoAP are extrapolated.

The year-on-year change in the estimated exclusive Mineral Resources is reconciled in Figure 12.

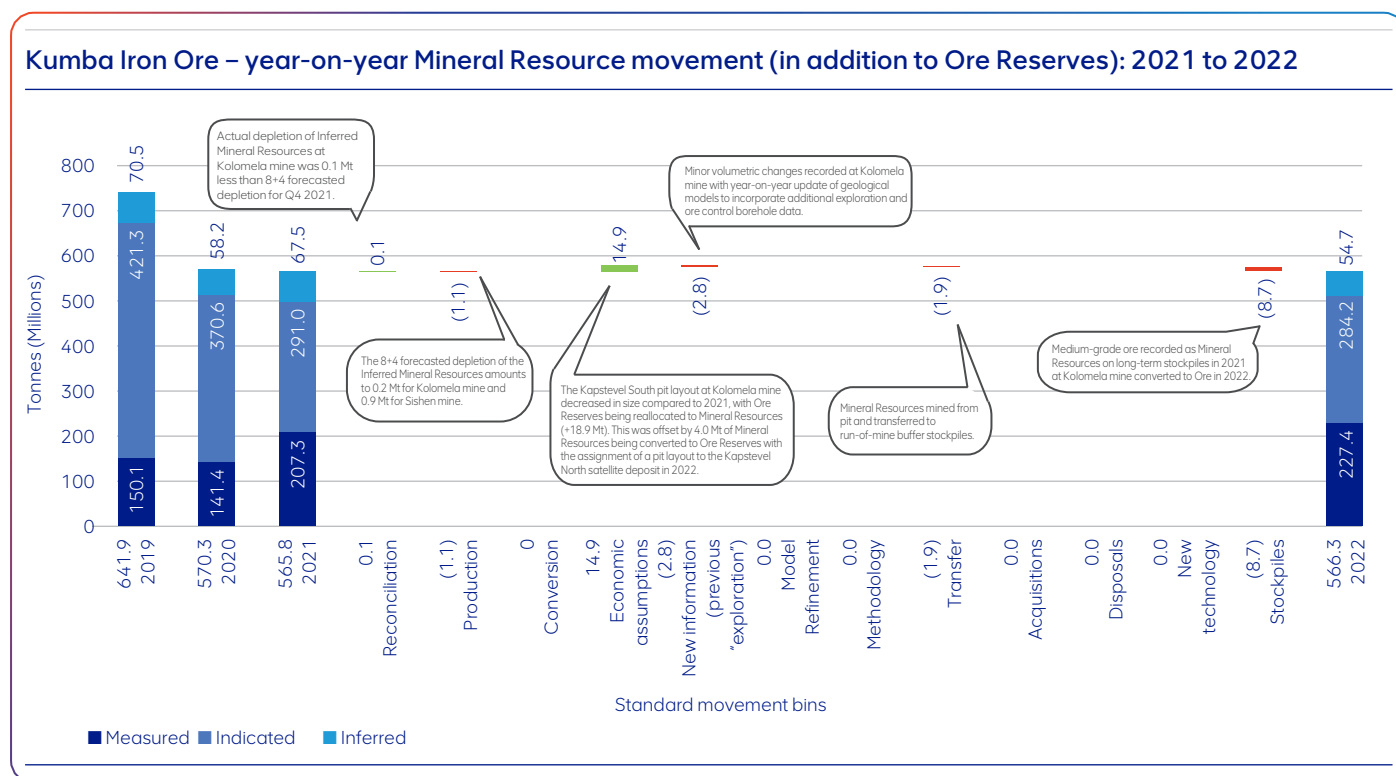


Figure 12: 2021 to 2022 movement in Kumba Mineral Resources

# Risk

## What prominent risks have been identified that can result in the Ore Reserves and Mineral Resources not realising as estimated?

Apart from the Mineral Resource and Ore Reserve estimation confidence classifications, Kumba, on an annual basis, asks its CPs to highlight prominent (ranked high and significant as per the standard Anglo American risk matrix) R&R risks relevant to their specific sites. These risks are then re-evaluated and rated by the Lead CPs to consider its potential impact on the total Kumba business.

### Ore Reserve (and Saleable Product) risks

The 2022 Ore Reserve (and Saleable Product) estimates are subject to the following high/significant risks:

#### Financial

A substantial increase in operational costs, because of:

- the moderation of equipment efficiency planning assumptions (to align planning with the last three years' demonstrated performance)
- significant increases in costs (inflation and structural cost increases)
- moderation of the Transnet (rail) logistics assumptions have seen the LoAP valuations (NPV at 8% real) decrease for both the Kumba mining operations

*Mitigation: The 2023 pit optimisation exercises for both operations will consider the increase in mining cost. A project has been launched to review the optimal production, cost, and organisational structure to ensure the continued profitability of the business at acceptable margins while still delivering on the Company's strategic objectives.*

### Project (new internal risk)

At Sishen, the UHDMS project involves the conversion of the existing Sishen DMS plant to a UHDMS plant. During Q4, significant engineering complexity emerged relating to the design and construction of an operational plant.

*Mitigation: Kumba is currently undertaking a full review of the project including a potentially lower complexity option. Several capital and timing sensitivities have been run, which show that the project remains robust from an economic perspective. As a result of the review, a decision was made not to update the 2022 LoAP and associated Reserve declaration with the full benefit of UHDMS until the current challenges are resolved and reviewed. The 2022 Sishen Ore Reserve is therefore based on the 2021 LoAP with this year's depletion taken into account.*

### Saleable Product grades

Due to the inherent nature of the Mineral Resources and derived Ore Reserves, the Saleable Product qualities as scheduled in the Kolomela 2022 LoAP, considering existing beneficiation capabilities, do not meet current product specifications for Fe, SiO<sub>2</sub> and K<sub>2</sub>O for certain periods in the reserve life.

*Mitigation: Revised product specifications were agreed with the Anglo Marketing Department on Fe as well as all the contaminant grades for H1 2023 to address foreseen immediate product grade deviations, meaning that plans are in place to sell lower-grade product from Kolomela for H1 2023. The optimal product portfolio between Sishen and Kolomela is being evaluated as part of Project Meraki.*

## Mineral Resource risks

The 2022 Mineral Resource estimates are subject to the following significant risks:

### On-mine Ploegfontein exploration project at Kolomela (internal risk)

The Ploegfontein deposit located within the Kolomela mining right area is earmarked as the next deposit to be considered for conversion to Ore Reserves to restore the annual production output of Kolomela mine from 2027 onwards when the high-grade Leeuwfontein, Klipbankfontein and Kapstevel North pits' Ore Reserves have been depleted. Although there might be sufficient tonnages to supplement the run-of-mine, the associated *in situ* contaminant grades are considered problematic considering existing Client product specifications, specifically concerning *in situ* K<sub>2</sub>O and *in situ* P content.

*Mitigation: Geometallurgical borehole drilling and subsequent testing have been prioritised to gain an understanding of the beneficiability of the Ploegfontein deposit. A technical study has been launched in 2022 to further explore beneficiation and marketing solutions.*

### Sishen long-term geological model (new opportunity)

The Sishen value chain reconciliation process identified geological gains for the high-grade ore with concomitant losses in the low-grade portion. An investigation revealed that the high-grade ore gains are mainly due to the lag (due to model size and complexity) in collecting geological borehole information and updating the geological model that is used to inform the LoAP.

#### *Mitigation:*

- The resource geology function was centralised in 2022 to pool skills, allowing for the focused assignment of resources for the Company in terms of geological modelling.
- A full update of the Sishen geological model is in the process to inform the next cycle of Mineral Resource estimation, to also inform the 2023 LoAP and Ore Reserves.
- Kumba is investigating solutions to replace the Sishen explicit solids model with an implicit solids model, allowing for more rapid geological model updates.
- On-mine ore control and exploration drilling will be continued to front-end load the geological models and improve confidence in Mineral Resource estimates.
- The low-grade ore geological losses will be investigated in 2023.

# Ancillary Reserve and Resource information per operation

The ancillary Reserve and Resource information is provided to conform to the SAMREC Code requirements of materiality and transparency.

All the production-related figures quoted in this section are forecasted (8 actual + 4 planned) as the compilation of the site Resource and Reserve Statements, from which the public R&R Statement was derived for Kumba, commenced on 1 October 2022. This early reporting date prior to year end is necessitated by the time required for the stringent peer review process within the Anglo American group, which requires Resource and Reserve estimates to be interrogated by peers before being published.

## Kolomela Location

Kolomela is located 12km south-west of the town of Postmasburg (**Figure 13**) in the Tsantsabane Local Municipality within the boundaries of the ZF Mgcawu District of the Northern Cape province in the Republic of South Africa.

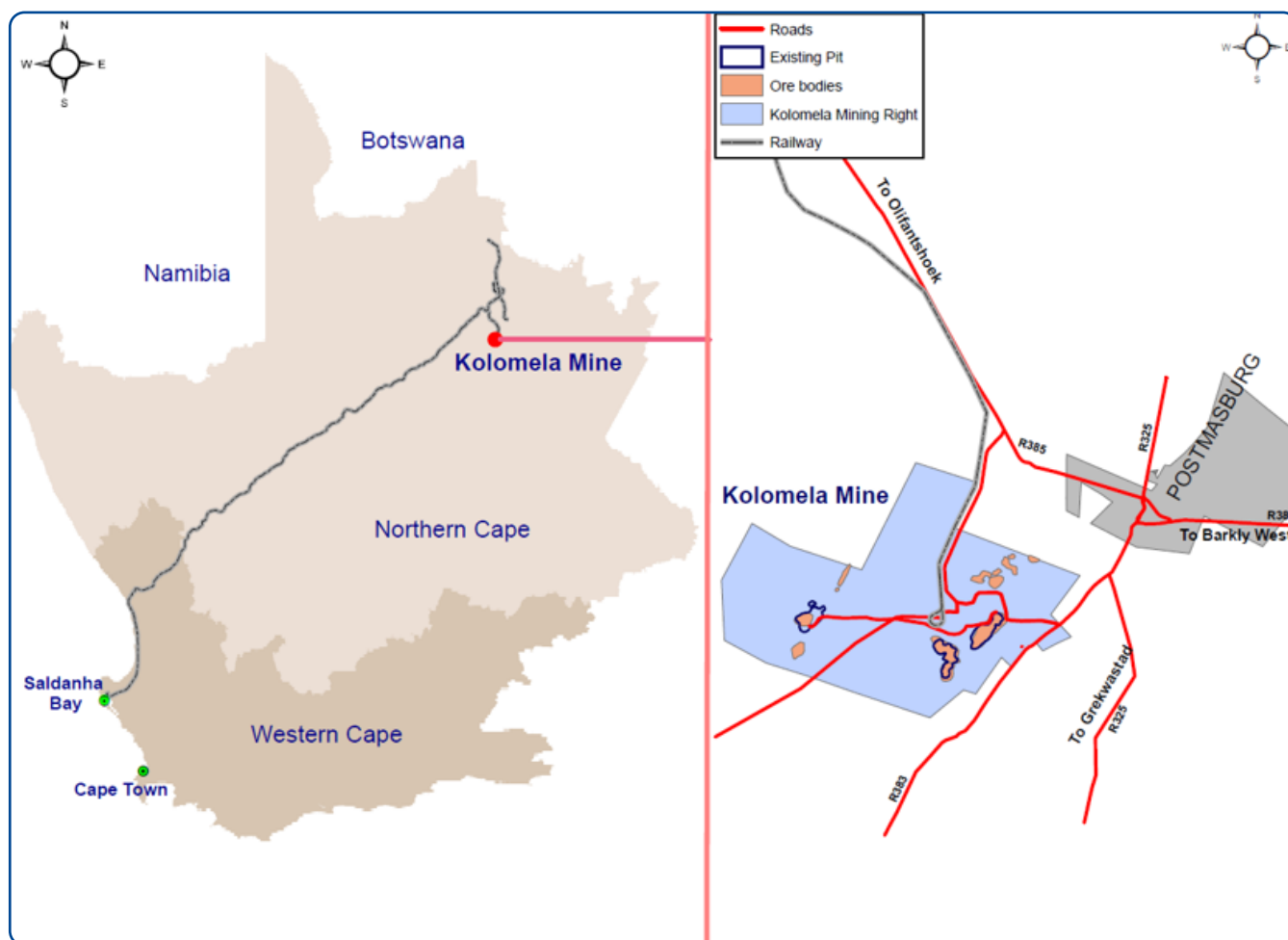


Figure 13: Location and logistics chain of Kolomela



## Geological outline

### Regional geology

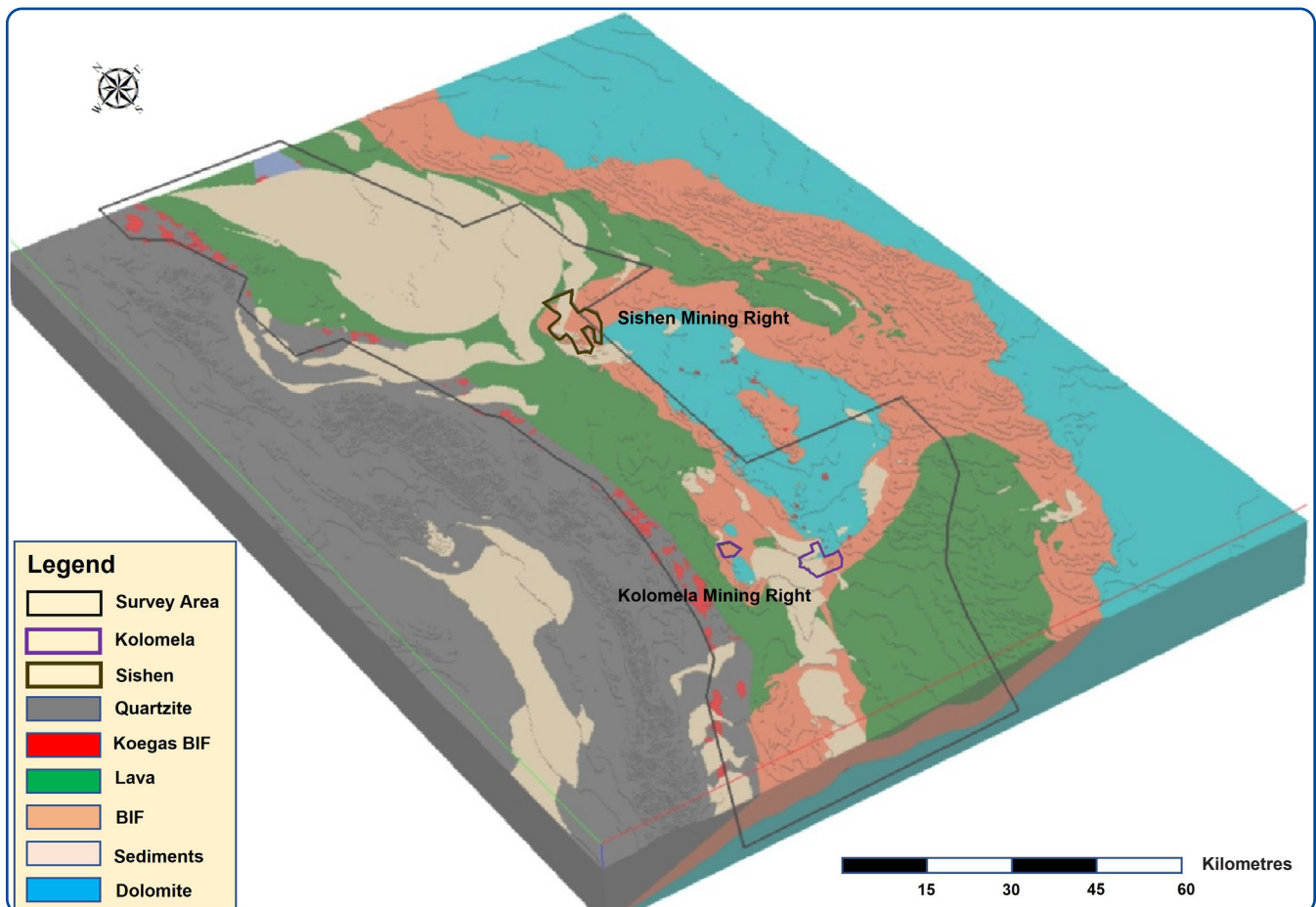
Kolomela is located towards the southern end of the “iron ore belt” in the Northern Cape province of South Africa (**Figure 14**).

The Transvaal Supergroup (Eriksson *et al*, 1993; 1995) or Griqualand West Supergroup, as it is referred to where it occurs in the Northern Cape, is host to all of the iron ore occurrences in the region. The Supergroup was deposited in fault-controlled basins on a basement of Archaean granite gneisses and greenstones and/or lavas of the Ventersdorp Supergroup (Beukes, 1983). In the Kathu-Postmasburg region, the oldest rocks of the approximately 8 km thick Griqualand West Supergroup (Beukes, 1980) are the ~1.6 km thick carbonate platform sediments (dolomites with minor limestone, chert and shale) of the Campbell Rand Subgroup of the Ghaap group (Beukes, 1983; Altermann and Wotherspoon, 1995; Beukes, 1986).

Conformably overlying the carbonates is the BIF unit, the Asbestos Hills Subgroup (Beukes, 1980), which is considered to be a Superior-type BIF, that can be up to 500 m thick. Locally, the upper portion of the BIF (Kuruman Iron Formation) has been

enriched to ore grade, i.e. Fe > 60%, and the ores found within this unit comprise the bulk of the high-grade iron ores in the region. The Kuruman Iron Formation is conformably overlain by the Griquatown Iron Formation. The two iron formations differ in that the Griquatown Iron Formation, comprising mainly allochemical sediments, was deposited in a shallow-water, storm-dominated epeiric sea (Beukes, 1984), whereas the Kuruman Iron Formation, comprising orthochemical iron formations, was developed in the basin (Beukes, 1980). However, in the Meramane Dome area, the Griquatown Iron Formation has been almost entirely removed by erosion along an unconformity separating the BIFs from the overlying clastic sediments of the Gamagara Formation.

During uplift and erosion, solution and karstification of the upper dolomitic units of the lower Ghaap group occurred and a 10 to 20 m thick residual solution breccia, referred to as the “Manganese Marker”, “Wolhaarkop Breccia” (van Wyk, 1980; van Schalkwyk and Beukes, 1986) or Wolhaarkop Formation, developed between the basal dolomites and overlying BIF. Locally, deep sinkholes developed in the dolomites, into which the overlying iron formation collapsed (Beukes, 1983).



**Figure 14:** Kolomela's location in the Northern Cape province “iron ore belt” of South Africa

A thick sequence of younger clastic sediments (shales, quartzites and conglomerates) of the Gamagara Formation unconformably overlie the Ghaap group rocks and some of the conglomerates, comprised almost entirely of haematite, constitute lower-grade iron ore. The Gamagara Formation, interpreted as the base of the Palaeoproterozoic

(~2.1 – 1.83 Ga) Olifantshoek Supergroup is overlain by the Palaeoproterozoic (~2.35 – 2.1 Ga) Postmasburg group along an interpreted thrust contact in the area (van Schalkwyk and Beukes, 1986; Frieze and Alchin, 2007). The thrust fault has been folded during subsequent deformation.

# Ancillary Reserve and Resource information per operation cont.

## Geological outline continued

### Regional geology continued

An altered gabbroic sill in the Kolomela area typically separates the iron ore from the underlying host BIF, or is intrusive in the BIF at Kolomela (Carney and Mienie, 2002). It is interpreted to have intruded into the Griqualand West Supergroup in late Proterozoic times (Friese and Alchin, 2007). The localised unit is prominent in the Leeuwfontein and Klipbankfontein ore bodies but absent in other areas.

Diamictite of the Makganyene Formation (de Villiers and Visser, 1977) and lava of the Ongeluk Formation (Postmasburg group) have been thrust over the Gamagara Formation sediments in the vicinity of Postmasburg, which are now preserved only within the larger synclinal basins (Schütte, 1992).

Makganyene diamictites comprise massive to poorly bedded diamictite, pebbly sandstone and siltstone, shale and mudstone up to 100 m thick, which are interpreted as piedmont glacial and glaciofluvial assemblages (Beukes, 1983; Visser 1971). A

second facies within the Makganyene contains mainly stacked cycles of graded bedded diamictite-greywacke-siderite bandlutite, which have been interpreted as glaciomarine deposits (Beukes, 1983). The Ongeluk lavas (600 m thick; Schütte, 1992) were extruded under water in a marginal basin within the continental setting of the Kaapvaal Craton (Schütte, 1992), and comprise essentially tholeiitic basaltic andesites.

The lavas have been dated at  $2,240 \pm 57$  Ma (Walraven *et al*, 1982),  $2,239 \pm 90$  Ma (Armstrong, 1987) and  $2,222 \pm 13$  Ma (Cornell *et al*, 1996).

A considerable portion of the upper parts of the stratigraphy was eroded during Dwyka glaciation and redeposited as tillite (Visser, 1971) during the Cretaceous era. The entire, folded sequence was later truncated by Tertiary erosion and a thick blanket of calcrete, dolocrete, clays and pebble layers of the Kalahari group were deposited unconformably over older lithologies.

### Stratigraphy

Iron ore at Kolomela is associated with the chemical and clastic sediments of the Proterozoic Transvaal Supergroup. These sediments define the western margin of the Kaapvaal Craton in the Northern Cape province. The stratigraphy has been deformed by thrusting from the west and has undergone extensive karstification. The thrusting has produced a series of open, north-south plunging anticlines, synclines and grabens and karstification has been responsible for the development of deep sinkholes. The iron ore at Kolomela has been preserved from erosion within these geological structures. These structures are therefore important exploration targets. The Kolomela local stratigraphy is illustrated in **Figure 15**.

The Transvaal Supergroup lithologies were deposited on a basement of Archaean granite gneisses and greenstones, and/or lavas of the Ventersdorp Supergroup. In the Sishen-Postmasburg region, the oldest rocks of the Transvaal Supergroup form a carbonate platform sequence (dolomites with minor limestone, chert and shale) known as the Campbell Rand Subgroup. The upper part of the Transvaal Supergroup comprises a BIF unit, the Asbestos Hills Subgroup, which has been conformably deposited on the carbonates. In places, the upper portion of the BIF has been supergene-enriched to  $\text{Fe} \geq 60\%$ . The iron ore/BIF zone is referred to as the Kuruman Formation. The ores found within this formation comprise the bulk of the higher-grade iron ores in the region.

Iron ore at Kolomela is associated with the chemical and clastic sediments of the Proterozoic Griqualand West Supergroup. These sediments define the western margin of the Kaapvaal Craton in the Northern Cape province.

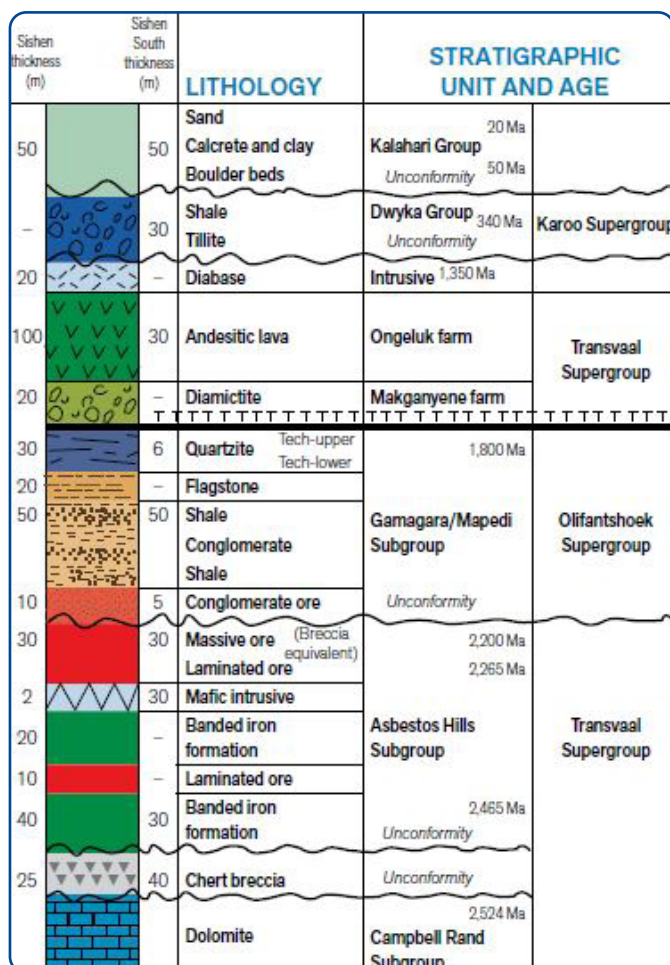


Figure 15: Simplified stratigraphic column depicting the Kolomela local geology

## Geological outline continued

### Stratigraphy continued

The stratigraphy has been deformed by thrusting from the west and has undergone extensive karstification. The thrusting has produced a series of open, north-south plunging anticlines, synclines and grabens, and karstification have been responsible for the development of deep sinkholes. The iron ore at Kolomela have been preserved from erosion within these geological structures. These structures are therefore important exploration targets.

An altered mafic intrusive sill (originally of gabbroic composition) usually separates the iron ore deposits from the underlying host iron formation. It is believed to have intruded the Griqualand West Supergroup in late Proterozoic times.

A thick sequence of younger clastic sediments (shales, quartzites and conglomerates) belonging to the Gamagara Subgroup unconformably overlies the BIFs. Some of the conglomerates comprise predominantly haematite and are of lower-grade ore quality. The unconformity separating the iron formations from the overlying clastic sediments represent a period of folding, uplift and erosion.

During this time, dissolution and karstification took place in the upper dolomitic units. This resulted in the formation of residual solution breccias, referred to as the "Manganese Marker" or "Wolhaarkop Breccia", between the dolomites and overlying BIFs. In places, deep sinkholes developed in the dolomites, into which the overlying iron formation and iron ore deposits collapsed.

Diamictite of the Makganyene Formation and lava of the Ongeluk Formation have been thrust over the Gamagara sediments in the Kolomela region. These are preserved only within larger synclinal structures.

A considerable portion of the upper parts of the stratigraphy were eroded and redeposited as tillite during Permo-Carboniferous Dwyka glaciation. The entire folded sequence was then eroded during Tertiary times. A thick blanket of calcrete, dolocrete, clays and pebble layers (Kalahari group) was deposited unconformably over the older lithologies.

Evidence of karst formation after the development of the calcretes of the Edin and Boudin Formation can be seen in the current Leeuwfontein pit.

### Tectonic setting

Structurally, Kolomela lies on the western margin of the Kaapvaal Craton, and has been affected by Kheis Orogeny.

The deformation intensity increases from east to west and the area is dominated by regional-scale synforms and antiforms – the so-called Welgevonden Basin and Wolhaarkop antiform.

The area west of the Wolhaarkop antiform (including the western limb of the antiform) is characterised by tight overturned fold structures that verge towards the east. The overturned limbs of the fold structures are locally disrupted, which have produced thrusts with limited displacement. East of the antiform (Kolomela area), the folds are upright, tight-to-open structures that have variable inter-limb angles. All of the fold structures west of the antiform are the product of east-west crustal contraction during the Kheis Orogeny, which produced eastward-directed thrusting.

Thrust faults that were intersected in drill core in the Welgevonden north area caused duplication of the stratigraphy. The high degree of associated deformation is clearly illustrated in drill core from the Welgevonden area and duplication or elimination of iron ore may occur.

The Wolhaarkop area is structurally more intensely deformed than the Kapsteveld and the Welgevonden areas. The folds are tight to isoclinal, over-folded with an eastwards vergence. With subsequent deformation the fold structures became disrupted, resulting in thrust structures with eastwards directed movement.

The high-strain zones (thrusts) are locally characterised by a high degree of ferruginisation of extensively brecciated BIF. In some places, the ore is preserved as narrow, tightly folded lenses within the high-strain zones.

### Local geology

Four distinct high-grade iron ore types have been described at Kolomela in the various separate iron ore deposits:

- High-grade (Fe-rich) laminated ore, which constitutes the main ore type and comprises alternating micro bands of high-lustre haematite with equally thin, porous bands of lower-lustre haematite and specularite. The primary lamination of the precursor BIF is still preserved, suggesting supergene enrichment (*in situ* replacement) of silica by iron.
- High-grade (Fe-rich) clastic-textured ore, comprising alternating haematite and specularite layers, thicker than those of the laminated ore and characterised by distorted, wavy bedding and occurs as lenses and massive units.
- High-grade (Fe-rich) collapse breccia-type ore, comprising angular fragments of laminated and clastic-textured ore in chaotic arrangement. The fragments are cemented by fine-grained specularite and haematite. The brecciation is probably as a result of karstification of the underlying dolomites, i.e. the collapse breccia ore is the product of sudden, brittle collapse of laminated and clastic-textured ores into underlying solution cavities and is preserved in deep sinkhole structures.
- High-grade (Fe-rich) conglomeratic ore, comprising poorly sorted, rounded to sub-rounded haematite pebbles and clasts in a ferruginised matrix representing, which usually occurs very localised and is considered to represent ferruginised Gamagara conglomerates.
- In addition, material defined in the geological models with an *in situ*  $50\% \leq \text{Fe} < 61\%$ , comprising ferruginised BIF, conglomerates and collapse breccia material, is termed medium-grade ore.

The proportion of high-grade ore to medium-grade ore for the inclusive Mineral Resources as stated in 2022 is 87 to 13.

Geological interpretations have been derived from validated borehole data comprising 6,471 boreholes (3,247 exploration and 3,224 grade control boreholes). The red dots in **Figure 16** depict the additional exploration boreholes used in the 2018 geological model update.



# Ancillary Reserve and Resource information per operation cont.

## Geological outline continued

### Local geology continued

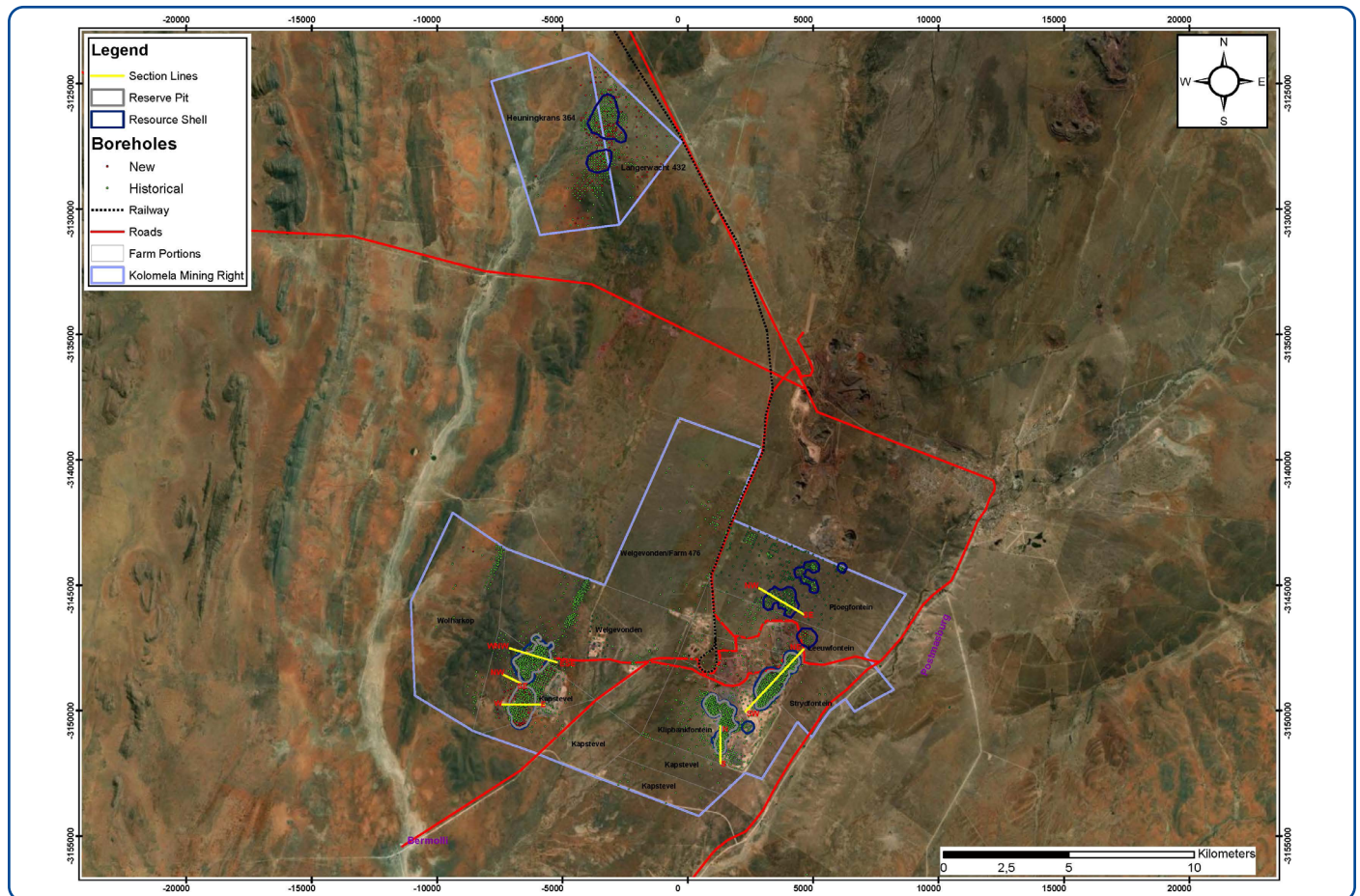


Figure 16: Kolomela mining right area

The geometry of the different ore bodies is depicted via cross-sections taken through the 3D solids models of the various ore bodies:

- Cross-section AB (**Figure 17**) as referenced in plan (**Figure 16**)  
(north-east to south-west cross-section through the Leeuwfontein ore body)
- Cross-section CD (**Figure 18**) as referenced in plan (**Figure 16**)  
(west-north-west to east-south-east cross-section through the Klipbankfontein ore body)
- Cross-section EF (**Figure 19**) as referenced in plan (**Figure 16**)  
(west-north-west to east-south-east cross-section through the Kapstevl North ore body)
- Cross-section GH (**Figure 20**) as referenced in plan (**Figure 16**)  
(north-west to south-east cross-section through the Kapstevl South ore body)
- Cross-section IJ (**Figure 21**) as referenced in plan (**Figure 16**)  
(west-north-west to east-south-east cross-section through the Ploegfontein ore body)

The vertical scale has been exaggerated in all the cross-sections, for illustration purposes, resulting in ore body dip angles appearing steeper than actual.



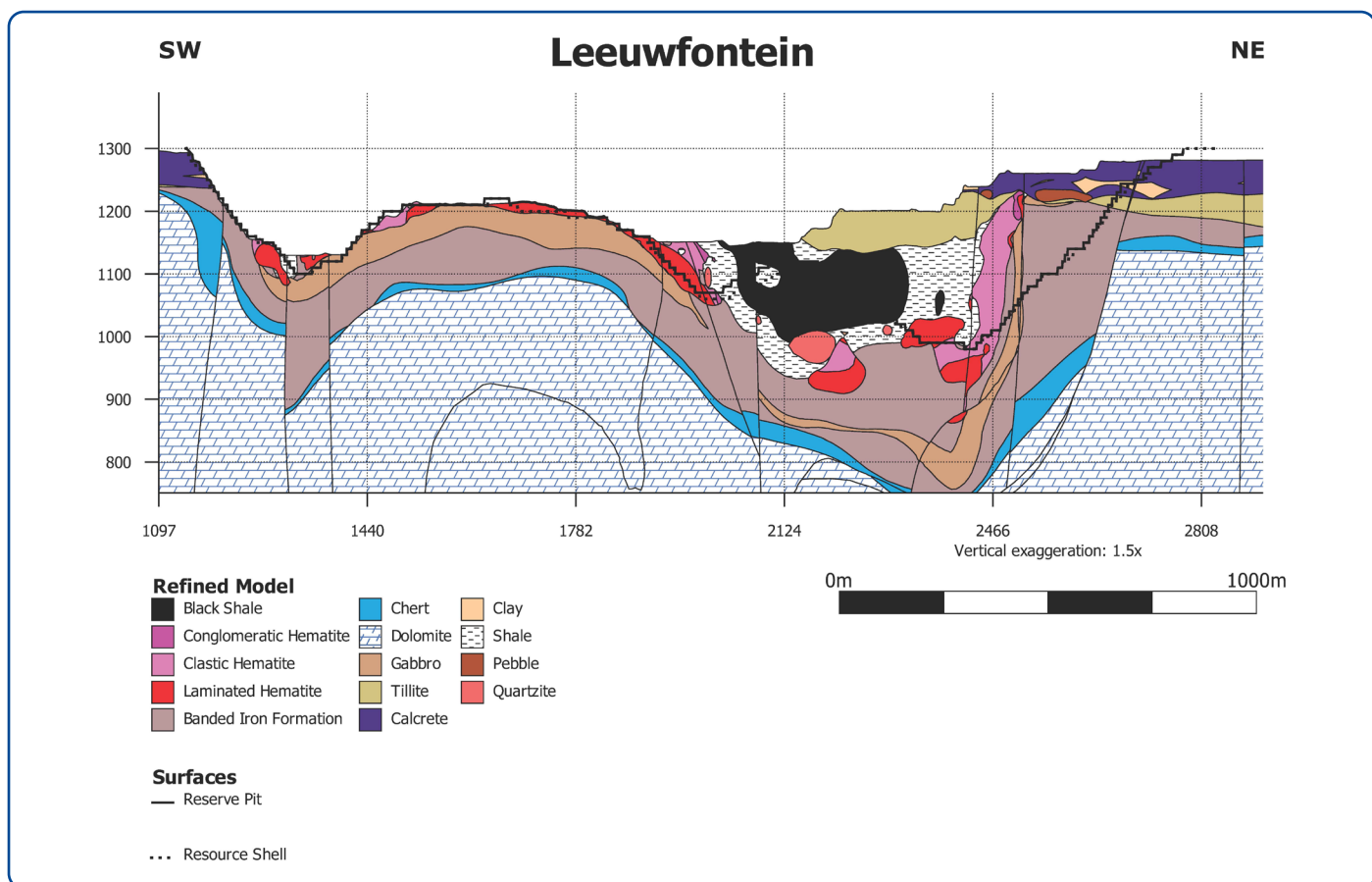


Figure 17: SW-NE cross-section through the Leeuwnfontein deposit

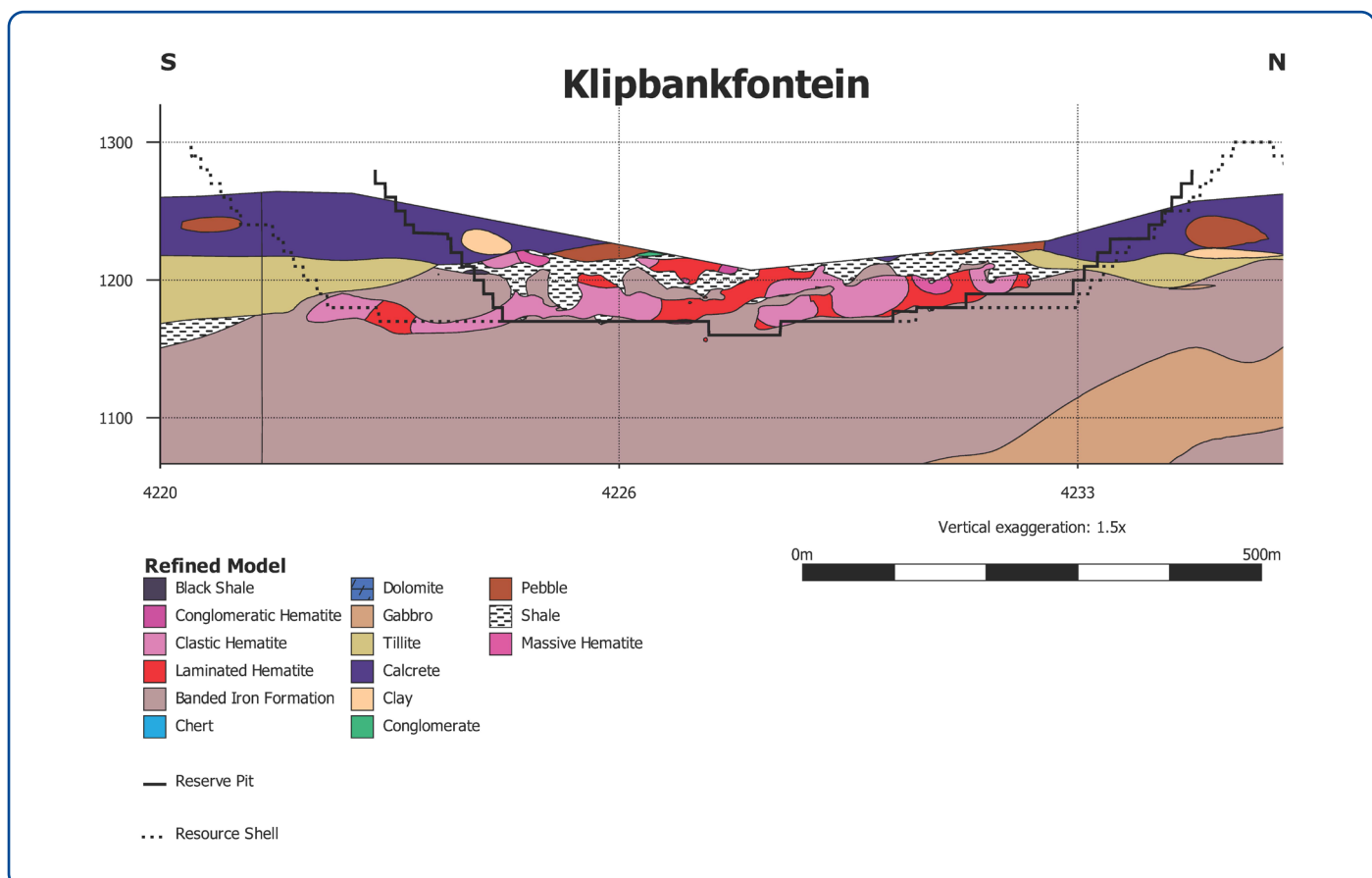


Figure 18: WNW-ESE cross-section through the Klipbankfontein deposit

## Local geology continued

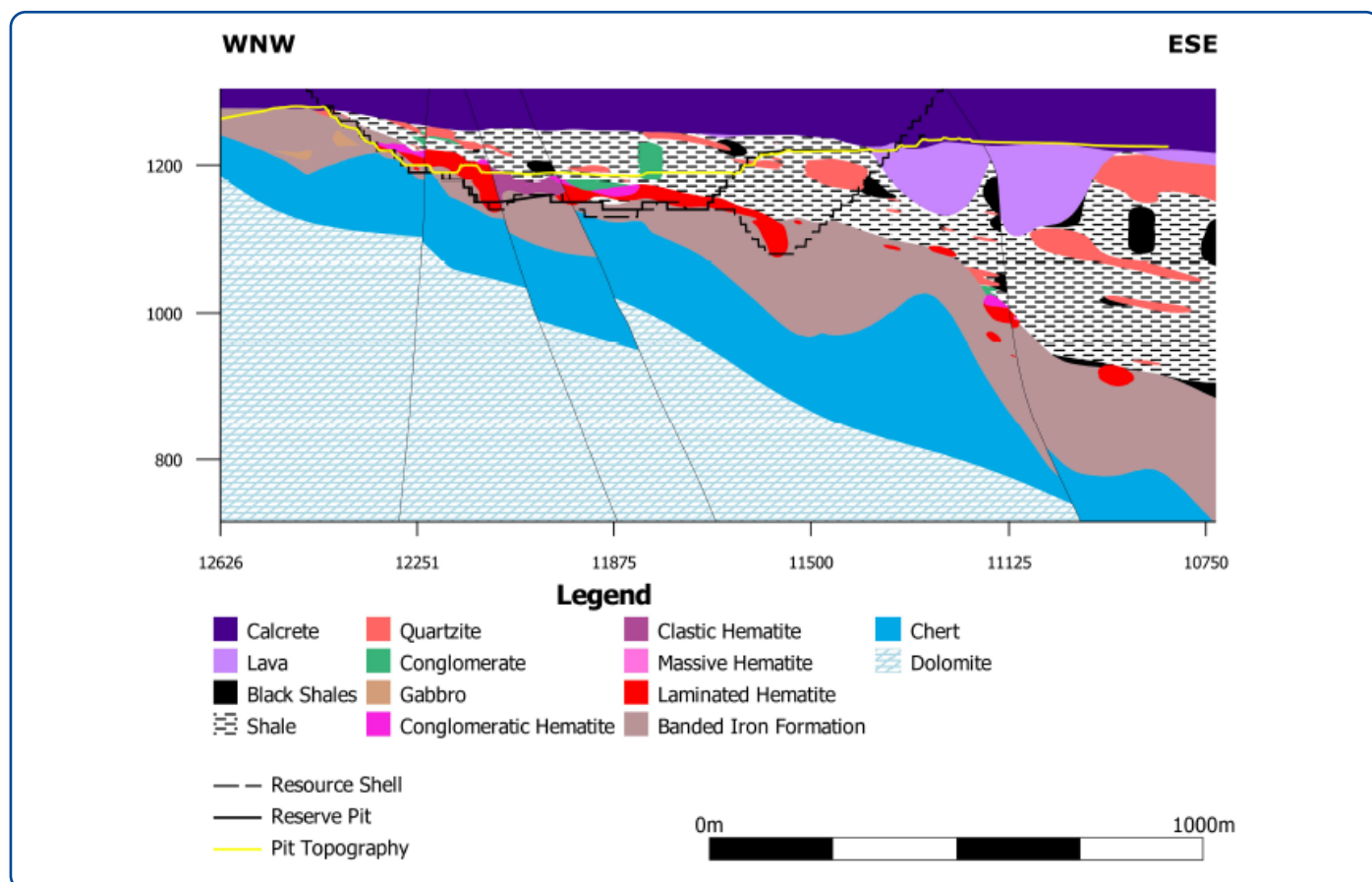


Figure 19: WNW-ESE cross-section through the Kapsteveld North deposit

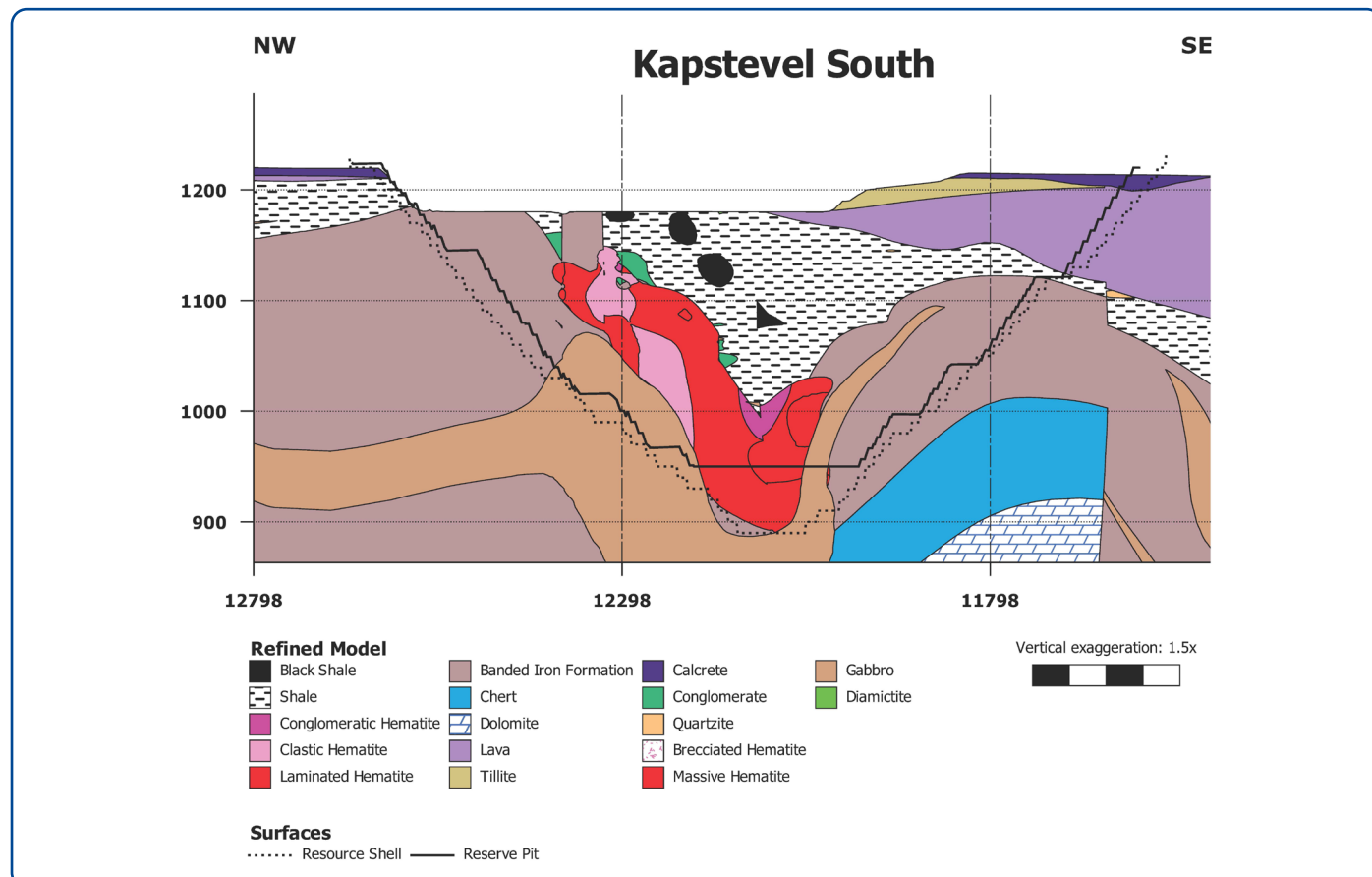


Figure 20: WNW-ESE cross-section through the Kapsteveld South deposit

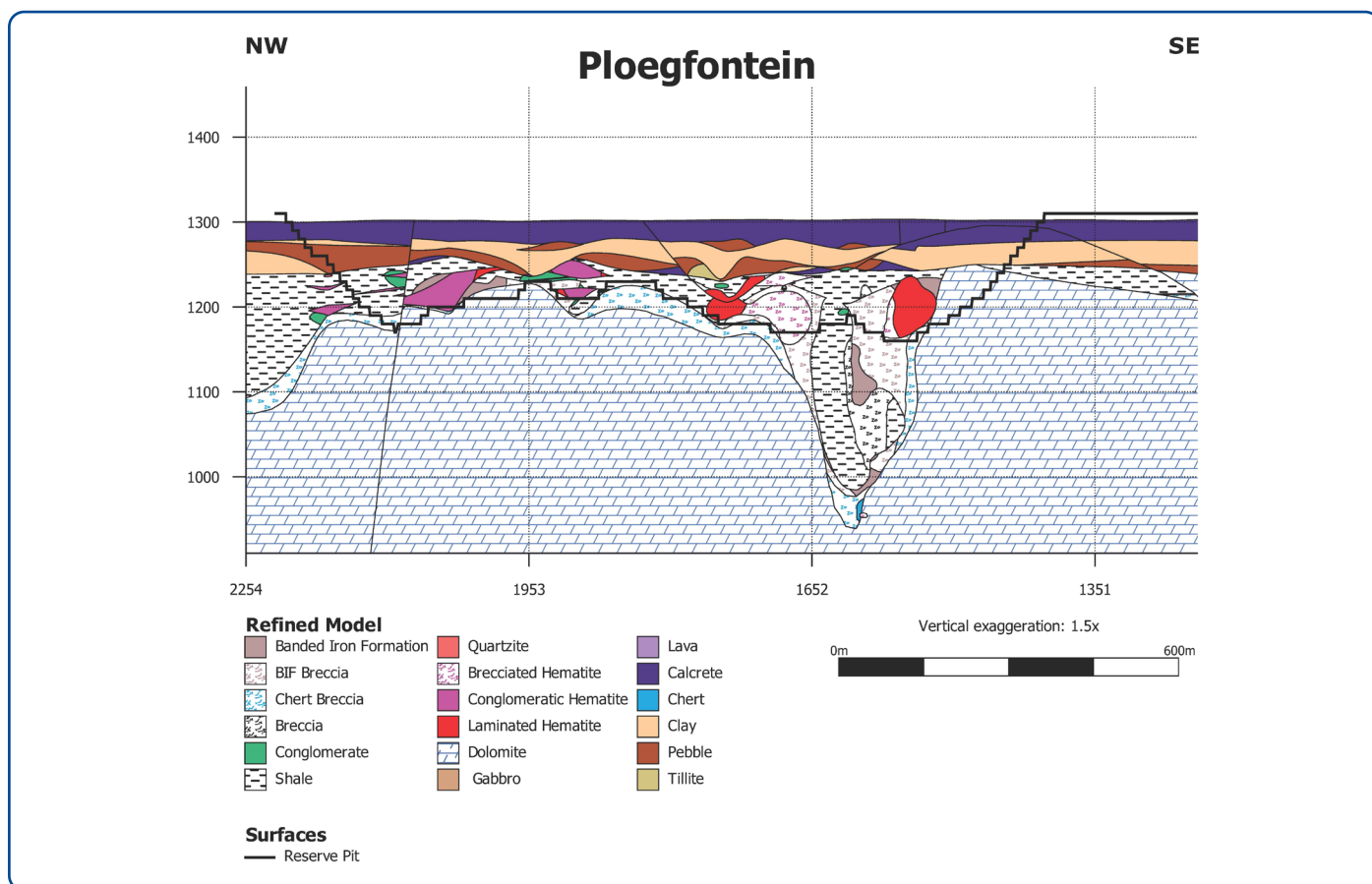


Figure 21: NW-SE cross-section through the Ploegfontein deposit

## Operational outline

Kolomela has been designed as a DSO operation where conventional open-pit drilling and blasting, shovel loading and truck-hauling mining processes are applied to generate plant feed. In 2022, ore was loaded and hauled from the Leeuwfontein, Klipbankfontein and Kapstevél North pits. The 2022 LoAP also planned mining of the Kapstevél South ore body, with waste stripping that commenced in 2020.

The iron ore is loaded according to blend (grade) requirements and transported to designated run-of-mine finger stockpiles dependent on the Ore Control Model estimated Fe grade and contaminant grade of the load. The primary crushing and screening DSO plant is fed from the finger stockpiles in blend ratios ensuring that the Lump and Fine product is suitable for

Client uptake (considering subsequent blending with Sishen mine product at the Saldanha harbour stock yard). A modular small-scale DMS plant was commissioned in 2016 and is scheduled to contribute 14% of the total Saleable Product as per the 2022 LoAP (10% in 2021 LoAP) through the treatment of medium-grade ore material.

The iron ore product (on average 57% Lump to 43% Fines) is railed to the Saldanha export harbour via the Sishen-Saldanha iron ore export line. The product is marketed to SIOC's current overseas customer base as part of the SIOC marketing strategy and is blended with Sishen mine's product. .

Kolomela's key operational parameters are summarised in **Table 8**.

# Ancillary Reserve and Resource information per operation cont.

## Operational outline continued

**Table 8:** Kolomela operational outline summary

| Key details  | 2022<br>8+4 forecast ( <b>actual</b> )   | 2021<br>9+3 forecast ( <b>actual</b> )  |
|--|--|---|
| % Ownership (AA plc)   | 52.5   | 53.2  |
| % Ownership (KIO)  | 75.4   | 76.3  |
| Commodity  | Iron ore   | Iron ore  |
| Country  | Republic of South Africa   | Republic of South Africa  |
| Mining method(s)   | Open-pit – Conventional  | Open-pit – Conventional   |
| Beneficiation method(s)  | DSO (crushing and screening) and small-scale DMS   | DSO (crushing and screening) and small-scale DMS  |
| Reserve life* (years)  | 12   | 13  |
| Estimated Saleable Product Lump : Fine ratio   | 57 : 43  | 60 : 40   |
| Saleable Product design capacity (Mtpa)  | 15   | 15  |
| Forecasted <sup>§</sup> and ( <b>actual</b> ) run-of-mine production (Mt dry) including modified Inferred Mineral Resources        | 11.7 ( <b>10.9 actual</b> )<br>(including 0.2 Mt modified Inferred Mineral Resources)              | 13.8 forecasted ( <b>13.1 actual</b> )<br>(including 0.2 Mt modified Inferred Mineral Resources)              |
| Forecasted <sup>§</sup> and ( <b>actual</b> ) Saleable Product (Mt dry) including modified beneficiated Inferred Mineral Resources | 11.2 ( <b>10.5 actual</b> )<br>(including 0.2 Mt modified beneficiated Inferred Mineral Resources) | 13.3 forecasted ( <b>12.8 actual</b> )<br>(including 0.2 Mt modified beneficiated Inferred Mineral Resources) |
| Forecasted <sup>§</sup> and ( <b>actual</b> ) Waste production (Mt dry)  | 54.9 ( <b>47.5 actual</b> )  | 62.4 forecasted ( <b>63.3 actual</b> )  |
| Forecasted <sup>§</sup> and ( <b>actual</b> ) railed product (Mt dry)  | 11.5 ( <b>10.3 actual</b> )  | 12.6 ( <b>12.0 actual</b> )   |
| Overall planned stripping ratio (LoAP)   | 4.4 : 1  | 4.5 : 1   |
| Product Types  | Standard Lump and standard Fines   | Premium Lump and standard Lump and standard Fines   |
| Mining right expiry date   | 17 September 2038  | 17 September 2038   |

\* Reserve life represents the period in years in the approved LoAP for scheduled processing of Proved and Probable Ore Reserves, where the Proved and Probable Ore Reserves makes up >25% of the year's run-of-mine. Should the scheduled LoAP years exceed the mining right expiry date, the reserve life is calculated to exclude the years post the expiry date.

§ The forecasted figures align with the year-on-year Reserve and Resource movement figures as the site Reserve and Resource Statements are reported end October to allow for sufficient internal (Kumba) and independent internal (Anglo) and external (Exxaro) peer reviews of the Resources and Reserves.

### For 2022

The total tonnes extracted from four pits (Leeuwfontein, Klipbankfontein, Kapstevel North and Kapstevel South) at Kolomela is foreseen to decrease by 11% from 77.4 Mt (14.1 Mt ex-pit ore and 63.3 Mt ex-pit waste) in 2021 to an estimated (at the time of reporting) 68.6 Mt (13.7 Mt ex-pit ore and 54.9 Mt ex-pit waste) in 2022. A total of 11.7 Mt (11.5 Mt Ore Reserves and 0.2 Mt modified Inferred Mineral Resources) is forecasted to be delivered to the DSO and UHDMS plants as run-of-mine, with an insignificant year-on-year run-of-mine buffer stockpile growth of 2.2 Mt.

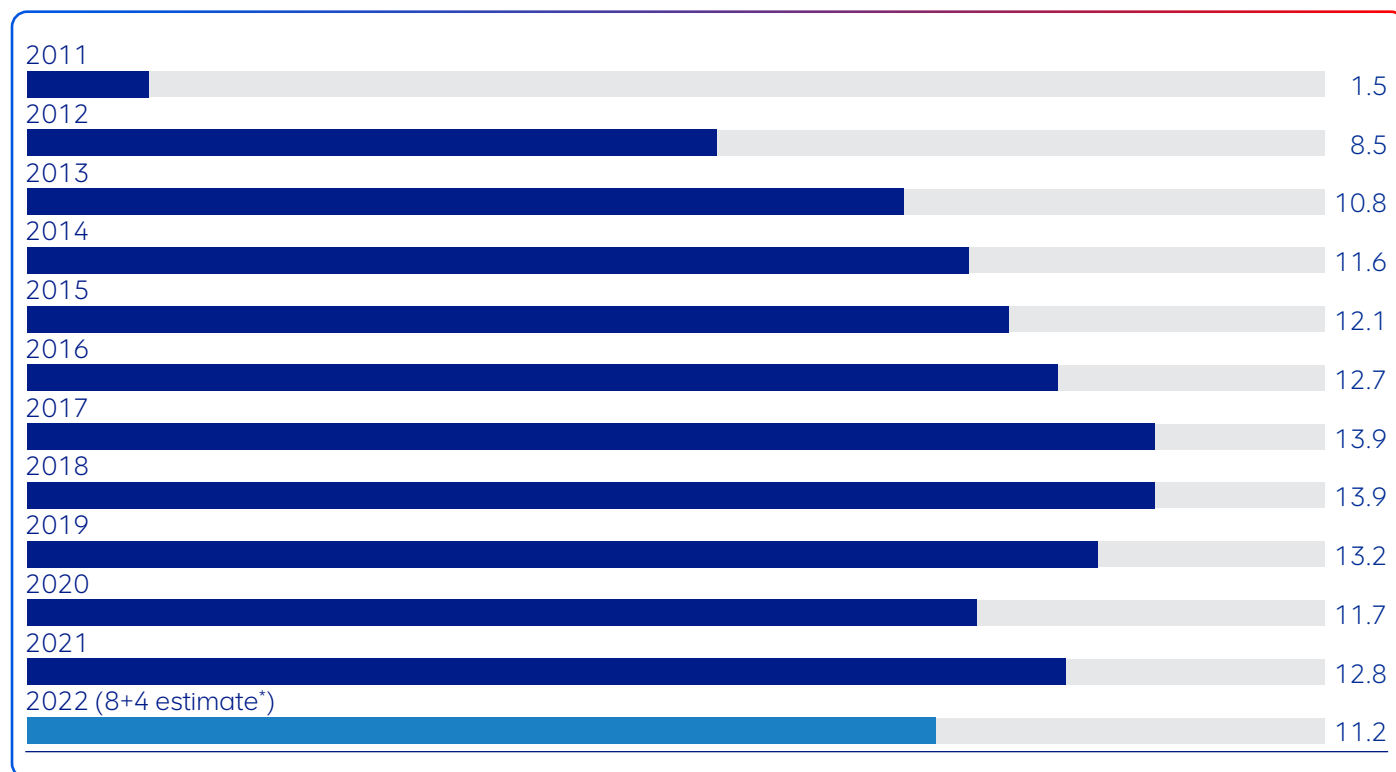
The estimated annual ex-pit waste to ex-pit ore ratio decreased from 4.5 : 1 in 2021 to 4.0 : 1 in 2022.

In total, 11.2 Mt of Saleable Product (including 0.2 Mt modified beneficiated Inferred Mineral Resources) is expected to be produced on-site (**Figure 22**) from the run-of-mine delivered to the crushing and screening and UHDMS plants in 2022 at an average annual yield of 95.7%, compared to 12.8 Mt in 2021. It is foreseen that 11.5 Mt of product will be sold in 2022.



## Production history

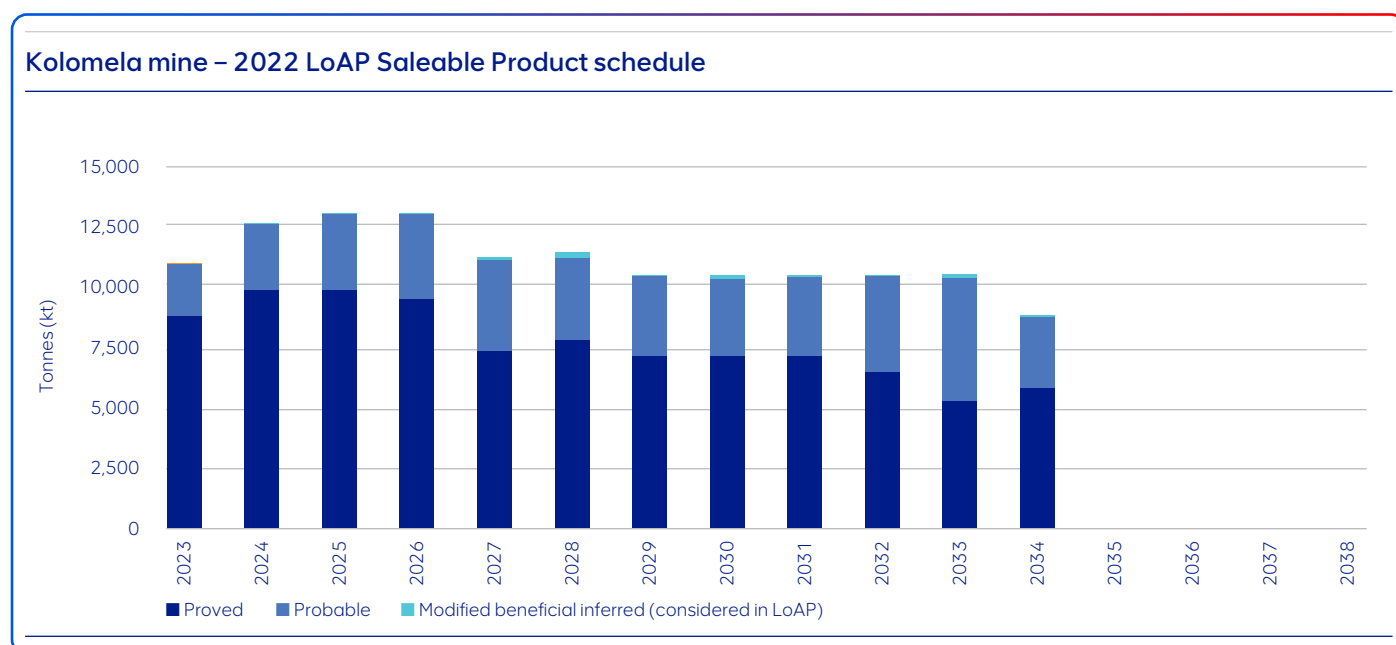
Kolomela's production history of Saleable Product is summarised in **Figure 21**.



**Figure 22:** Kolomela production history

## Life-of-asset plan Saleable Product profile

The 2022 LoAP Saleable Product profile is depicted in **Figure 23**.



**Figure 23:** Kolomela's 2022 LoAP Saleable Product profile (including modified beneficiated Inferred Mineral Resources)

# Ancillary Reserve and Resource information per operation cont.

## Ore Reserve ancillary information

The Kolomela Ore Reserve ancillary information is summarised in **Table 9A** (background information) and **Table 9B** (Kapsteveld South Ore Reserve estimation parameters – as an example).

**Table 9A:** Kolomela's 2022 versus 2021 Ore Reserve background information

| Kolomela  | 2022  | 2021  |
|---|---|---|
| <b>Location</b>   |   |   |
| Country   | Republic of South Africa  | Republic of South Africa  |
| Province  | Northern Cape   | Northern Cape   |
| <b>Ownership</b>  |   |   |
| Sishen Iron Ore Company Proprietary Limited             | 100%  | 100%  |
| Kumba Iron Ore Limited                                  | 75%   | 76.3%   |
| AA plc  | 53%   | 53.2%   |
| <b>Operational status</b>                               |   |   |
| Operation status  | Steady-state  | Steady-state  |
| Mining method   | Open cast (conventional drilling and blasting and truck and shovel operation)   | Open-pit (conventional drilling and blasting and truck and shovel operation)  |
| Beneficiation method                                    | DSO (only crushing and screening of high-grade run-of-mine) as well as DMS plant for medium-grade material  | DSO (only crushing and screening of high-grade run-of-mine) as well as DMS plant for medium-grade material                  |
| Average annual Saleable Product in LoAP (Mtpa)          | 11.2  | 11.2*   |
| Average annual supply to domestic market in LoAP (Mtpa) | 0   | 0   |
| Average annual supply to export market in LoAP (Mtpa)   | 11.2  | 11.2*   |
| Number of products                                      | Three product types (premium Lump as well as standard Lump and standard Fines)  | Three product types (premium Lump as well as standard Lump and standard Fines)  |
| <b>Governance</b>                                       |   |   |
| Code  | THE SAMREC CODE – 2016 EDITION  |   |
| AA plc group policy                                     | <a href="https://www.angloamericankumba.com/~media/Files/A/Anglo-American-Group/Kumba/sustainability/approach-and-policies/kumba-mineral-resource-and-ore-reserve-reporting-policy.pdf">https://www.angloamericankumba.com/~media/Files/A/Anglo-American-Group/Kumba/sustainability/approach-and-policies/kumba-mineral-resource-and-ore-reserve-reporting-policy.pdf</a> |   |
| AA plc requirements document                            | AA_RD_22-25 - Version 13 [2022] - (Exploration Results, Mineral Resources and Ore Reserves reporting requirements document )  | AA_RD_22-25 - Version 12 [2021] - (Exploration Results, Mineral Resources and Ore Reserves reporting requirements document) |
| KIO reporting protocols                                 | KIO Reserve classification guideline (Version 1)  |   |
| KIO reporting template                                  | Ore Reserve (and Saleable Product) reporting template (2022)  | Ore Reserve (and Saleable Product) reporting template (2021)  |

\* Note: The 2021 average annual Saleable Product in LoAP (Mtpa) was incorrectly indicated as 12.6 Mtpa instead of 11.2 Mtpa.

**Table 9A (continued):** Kolomela's 2022 versus 2021 Ore Reserve background information

| Kolomela  | 2022  | 2021  |
|---|---|---|
| <b>Reporting method</b>   |   |   |
| Approach  | <p>Ore Reserves are those derived from Measured and Indicated Mineral Resources only (through application of modifying factors) and do not include Inferred Mineral Resources. In the case of KIO, all Ore Reserves are constrained by practical pit layouts, mining engineered from pit shells that define "current economically mineable"</p> <p>The geological block model(s) is converted into a mining block model considering a site-specific practical mineable smallest mining unit. Furthermore, protocols ensure that KIO's operations/projects consider expected long-term revenues versus the operating and production costs associated with mining and beneficiation as well as legislative, environmental and social costs, in determining whether or not a Mineral Resource could be economically extracted and converted to an Ore Reserve. This is performed by applying a Lerchs-Grossmann algorithm to the mining model to derive an optimised pit shell. This optimised pit shell is then iteratively converted to a practical layout by applying geotechnical slope stability parameters and haul road and ramp designs, legal restrictions, etc., with safety being one of the most considered parameters. Once a practical pit layout has been established the material within the pit is scheduled over time to achieve Client specifications and thus an LoA schedule is produced</p> <p>The average % Fe grade and metric tonnage estimates of "Saleable Product" are also reported to demonstrate that beneficiation losses have been taken into account</p> |   |
| Scheduled run-of-mine metric tonnes (dry/wet)   | Dry   |   |
| Tonnage calculation   | Tonnages are calculated from the LoA schedule, originating from the mining block models, and are modified tonnages considering geological losses, the effect of dilution, mining losses, mining recovery efficiencies and design recovery efficiencies to derive the run-of-mine tonnages delivered to the crushing and screening and DMS plants  |   |
| Fe grade  | Ore Reserve % Fe grades reported, represent the weighted average grade of the "plant feed" or run-of-mine material and take into account all applicable modifying factors   |   |
| Cut-off grade (Fe)  | 50% (includes diluting material)  | 50% (includes diluting material)  |
| Ore type  | Haematite ore   | Haematite ore   |
| Optimised pit shell revenue factor  | 1.0   | 1.0   |
| <b>LoAP scheduling</b>  |   |   |
| Software  | OPMS  | OPMS  |
| Method  | Product tonnage and grade target driven to achieve required Client product specifications   | Product tonnage and grade target driven to achieve required Client product specifications |
| Stripping strategy  | Deferred waste stripping strategy   | Deferred waste stripping strategy   |
| Reserve life years  | 12  | 13  |
| LoAP run-of-mine tonnes (including modified Inferred) (expressed in million tonnes)   | 142.2   | 152.3   |
| Overall average stripping ratio (including Inferred Mineral Resources)  | 4.4 : 1   | 4.5 : 1   |
| Production data cut-off date (date where after short-term plan instead of actual figures are used to estimate the annual run-of-mine and Saleable Product production for the mine until 31 December of year of reporting) | 30 August 2022  | 30 September 2021   |
| Topography and pit progression assigned   | 31 December 2022  | 31 December 2021  |
| Reserve schedule ID (Schedule file name + extension)  | LTP Schedule_Sc10_20102022v4  | 2021 LTP Reserve report v3.xlsx   |
| Reserve schedule completion date  | 20 October 2022   | 20 October 2021   |

# Ancillary Reserve and Resource information per operation cont.

## Ore Reserve ancillary information continued

**Table 9B:** Kolomela's 2022 versus 2021 Kapstevl South Ore Reserves estimation parameters (similar tables exist for the Leeuwfontein, Klipbankfontein and Kapstevl North mining areas)

| Kapstevl South   | 2022   | 2021   |
|--|--|--|
| <b>Estimation</b>                                      |  |  |
| Mining block model name                                | KSS_smu101010LOAPv3  | KSS0321_101010v3   |
| Smallest mining unit                                   | 10 m(X) x 10 m(Y) x 10 m(Z)  | 10 m(X) x 10 m(Y) x 10 m(Z)  |
| <b>Practical mining parameters</b>                     |  |  |
| Bench height   | 10 m   | 10 m   |
| Ramp gradient  | 8% to 10.0% (1 in 8 to 1 in 10)  | 8% to 10.0% (1 in 8 to 1 in 10)  |
| Road width   | 35 m   | 35 m   |
| Minimum mining width                                   | 80 m (hydraulic shovel and truck mining)   | 80 m (hydraulic shovel and truck mining)   |
| Geohydrology   | Groundwater level maintained 20 m below pit floor  | Groundwater level maintained 20 m below pit floor  |
| Pit slopes   | Designed according to a defensible risk matrix, guided by an appropriate factor of safety of 1.3 and a probability of failure of 10% | Designed according to a defensible risk matrix, guided by an appropriate factor of safety of 1.3 and a probability of failure of 10% |
| <b>Pit optimisation</b>                                |  |  |
| Software   | Whittle 4X   | Whittle 4X   |
| Method   | Lerch-Grosmann (marginal cost cut-off analysis)  | Lerch-Grosmann (marginal cost cut-off analysis)  |
| <b>Modification</b>                                    |  |  |
| <b>Modifying factors</b>                               |  |  |
| Geological loss (%)                                    | 0  | 0  |
| Dilution (%)   | 5  | 8  |
| Mining loss (%)  | -5   | -5   |
| Mining recovery efficiency (%)                         | 95   | 97   |
| Design recovery efficiency (%)                         | 100  | 100  |
| Ore unutilised in 2021 LoAP (%)                        | -5   | -9   |
| Metallurgical yield (%) to convert to Saleable Product | 94.3   | 96.0   |
| <b>Estimator</b>                                       |  |  |
| Reserve estimator                                      | Sthembile Nkambule   | Sthembile Nkambule   |
| Reserve estimator status                               | Internal Specialist  | Internal Specialist  |
| Estimator employer                                     | Sishen Iron Ore Company Proprietary Limited  | Sishen Iron Ore Company Proprietary Limited  |

## Mineral Resource ancillary information

The Kolomela Mineral Resource ancillary information is summarised in **Table 10A** (background information) and **Table 10B** (Kapstevlei South Mineral Resource estimation parameters – as an example).

**Table 10A:** Kolomela's 2022 versus 2021 Mineral Resource background information

| Kolomela                                    | 2022  | 2021  |
|---|---|---|
| <b>Location</b>                             |   |   |
| Country                                     | Republic of South Africa  | Republic of South Africa  |
| Province                                    | Northern Cape   | Northern Cape   |
| <b>Ownership (%)</b>                        |   |   |
| Sishen Iron Ore Company Proprietary Limited | 100%  | 100%  |
| Kumba Iron Ore Limited                      | 75.4%   | 76.3%   |
| Anglo American plc                          | 52.5%   | 53.2%   |
| <b>Security of tenure</b>                   |   |   |
| Number of applicable mining rights          | 1   | 1   |
| Mining right status                         | Registered (amendments registered)  | Registered (amendments executed)  |
| Mining right expiry date(s)                 | 17 September 2038   | 17 September 2038   |
| <b>Exploration status</b>                   |   |   |
| Exploration type                            | Geological confidence (on-mine)   | Geological confidence (on-mine)   |
| Exploration phase                           | In execution  | In execution  |
| Ore type                                    | Haematite ore   | Haematite ore   |
| <b>Governance</b>                           |   |   |
| Code  | THE SAMREC CODE – 2016 EDITION  |   |
| AA plc group policy                         | <a href="https://www.angloamericankumba.com/~media/Files/A/Anglo-American-Group/Kumba/sustainability/approach-and-policies/kumba-mineral-resource-and-ore-reserve-reporting-policy.pdf">https://www.angloamericankumba.com/~media/Files/A/Anglo-American-Group/Kumba/sustainability/approach-and-policies/kumba-mineral-resource-and-ore-reserve-reporting-policy.pdf</a>   |   |
| AA plc requirements document                | AA_RD_22-25 - Version 13 [2022] - (Exploration Results, Mineral Resources and Ore Reserves reporting requirements document)   | AA_RD_22-25 - Version 12 [2021] - (Exploration Results, Mineral Resources and Ore Reserves reporting requirements document)   |
| KIO reporting protocols                     | KIO Geological confidence classification guideline (Version 5)  | KIO Geological confidence classification guideline (Version 5)  |
| KIO reporting template                      | Mineral Resource (and additional Mineralisation) reporting template (2022)  | Mineral Resource (and additional Mineralisation) reporting template (2021)  |
| <b>Reporting method</b>                     |   |   |
| Approach                                    | Mineral Resources are reported exclusive of Ore Reserves and not factoring in attributable ownership and only if: (1) spatially modelled; (2) spatially classified; (3) spatially constrained in terms of reasonable and realistic prospects for eventual economic extraction (occurring within an RPEEE-defined envelope, in other words not all mineral occurrences are declared as Mineral Resources); (4) declared within (never outside) notarially executed tenement boundaries |   |
| <i>In situ</i> metric tonnes (dry/wet)      | Dry   | Dry   |
| Tonnage calculation                         | Tonnages are added from cells in geological block model of which the centroids intersect the relevant geological ore domains in the solids models which occur inside the resource shell. The volume of each ore cell is multiplied with the estimated relative density of the same cell   | Tonnages are added from cells in geological block model of which the centroids intersect the relevant geological ore domains in the solids models which occur inside the resource shell. The volume of each ore cell is multiplied with the estimated relative density of the same cell |
| Fe grade                                    | Weighted average above cut-off grade  | Weighted average above cut-off grade  |
| Fe calculation                              | Tonnage-weighted mean of the estimated <i>in situ</i> Mineral Resource Fe grades contained within geological block models, constrained by the relevant Resource geological ore domains and RPEEE resource shell   | Tonnage-weighted mean of the estimated <i>in situ</i> Mineral Resource Fe grades contained within geological block models, constrained by the relevant Resource geological ore domains and RPEEE resource shell   |
| <b>RPEEE</b>                                |   |   |
| Cut-off grade                               | 50% Fe  | 50% Fe  |
| Resource shell revenue factor               | 1.6   | 1.6   |



# Ancillary Reserve and Resource information per operation cont.

## Mineral Resource ancillary information continued

**Table 10B:** Kolomela's 2022 versus 2021 Kapstevl South Mineral Resources estimation parameters – as an example (similar tables exist for the Leeuwfontein, Klipbankfontein, Kapstevl North, Ploegfontein and Wolhaarkop ore bodies but are not stated in this report)

| Kapstevl South geological model           | 2022  | 2021  |
|---|---|---|
| Input data                                |   |   |
| Borehole type                             | Core and percussion borehole lithological logs and associated chemical analyses   |   |
| Relative density measurement              | Picnometer analyses on pulp samples   |   |
| KIO QA/QC protocol                        | KIO QC Protocol for Exploration Drilling Sampling and Sub-sampling (version 10)   | KIO QC Protocol for Exploration Drilling Sampling and Sub-sampling (version 9)  |
| Primary laboratory                        | Anglo American Research<br>Division of Anglo Operations Limited<br>Chemistry Laboratory<br>(Co. reg no: 1921/006730/07)   | Anglo American Research<br>Division of Anglo Operations Limited Chemistry<br>Laboratory (Co. reg no: 1921/006730/07)                              |
| Accreditation                             | Accredited under International Standard ISO/IEC 17025:2005 by the South African National Accreditation System (SANAS) under the Facility Accreditation Number T0051 (valid until 30 April 2026) | Accredited under International Standard ISO/IEC 17025:2005 by the SANAS under the Facility Accreditation Number T0051 (valid until 30 April 2026) |
| Borehole database software                | acQuire   | acQuire   |
| Borehole database update cut-off date     | 31 March 2021   | 31 March 2020   |
| Database validation conducted             | Yes   | Yes   |
| Segmentation conducted                    | Yes. To allow for simplification of logged lithologies for spatial correlation purposes   |   |
| Statistical and geostatistical evaluation |   |   |
| Data compositing interval                 | 2 m   | 2 m   |
| Data compositing method                   | Length weighted average per lithology   | Length weighted average per lithology   |
| Grade parameters evaluated                | % Fe, % SiO <sub>2</sub> , % Al <sub>2</sub> O <sub>3</sub> , % K <sub>2</sub> O, % P and % Mn and % S as well as relative density  | % Fe, % SiO <sub>2</sub> , % Al <sub>2</sub> O <sub>3</sub> , % K <sub>2</sub> O, % P, % Mn and % S as well as relative density                   |
| Variography updated in current year       | No  | Yes   |
| Search parameters updated in current year | No  | Yes   |
| Solids modelling                          |   |   |
| Solids modelling software                 | Leapfrog  | Leapfrog  |
| Input                                     | Previous 3D implicit solids, borehole data and structural in-pit mapping  | Previous 3D implicit solids, borehole data and structural in-pit mapping  |
| Method                                    | Implicit solids modelling for all domains   | Implicit solids modelling for all domains   |
| Domaining                                 | Yes, by lithology and structural controls   | Yes, by lithology and structural controls   |
| Topography and pit progression assigned   | 31 December 2022 (planned pit boundary)   | 31 December 2021 (planned pit boundary)   |
| Validation conducted                      | Yes (for gaps and overlaps by software queries as well as honouring of borehole contacts) and by standard software validation tools   |   |

**Table 10B (continued):** Kolomela's 2022 versus 2021 Kapstevél South Mineral Resources estimation parameters – as an example (similar tables exist for the Leeuwfontein, Klipbankfontein, Kapstevél North, Ploegfontein and Wolhaarkop ore bodies but are not stated in this report)

| Kapstevél South geological model                          | 2022   | 2021   |
|---|--|--|
| <b>Grade estimation methodology</b>                       |  |  |
| Ore segments  | Ordinary (Co-) Kriging   | Ordinary (Co-) Kriging   |
| Waste segments  | Simple (Co-) Kriging   | Simple (Co-) Kriging   |
| <b>Geological block modelling</b>                         |  |  |
| Block modelling software                                  | Datamine   | Surpac   |
| Model type  | Centroid Model   | Centroid Model   |
| Parent cell size  | 40 m(X) x 40 m(Y) x 10 m(Z)  | 40 m(X) x 40 m(Y) x 10 m(Z)  |
| Minimum sub-block cell size                               | 5 m(X) x 5 m(Y) x 5 m(Z)   | 5 m(X) x 5 m(Y) x 5 m(Z)   |
| <b>Cell population method</b>                             |  |  |
| Tonnage   | Volume of lithology intersected by cell centroid and constrained by cell limits, multiplied with relative density estimate of the same lithology at same unique cell centroid position in space  | Volume of lithology intersected by cell centroid and constrained by cell limits, multiplied with relative density estimate of the same lithology at same unique cell centroid position in space  |
| Grade   | Estimate of grade at unique cell centroid position in space applicable to total volume or tonnage constrained by the cell  | Estimate of grade at unique cell centroid position in space applicable to total volume or tonnage constrained by the cell  |
| Updated geological block model ID (file name + extension) | kss022022_v1.dm  | ks022021_v1.dm   |
| Update completion date                                    | 28 February 2022   | 28 February 2021   |
| <b>Geological confidence classification</b>               |  |  |
| Method summary  | Scorecard / CP Over-ride   | Scorecard / CP Over-ride   |
| Classification thresholding                               | <p>According to the 2010 KIO Mineral Resource Classification Guideline (quantitative scorecard approach) with CP judgement applied to:</p> <ul style="list-style-type: none"> <li>identify critical factors to be used to evaluate grade and geological continuity. The critical factors increased from 10 to 12 factors in 2013 mainly in the Estimation Confidence Index. The weightings were updated for the Resource Confidence Index for Leeuwfontein, Klipbankfontein, Kapstevél North, Kapstevél South</li> <li>assign weights to establish importance of each parameter</li> <li>determine boundaries of calculated grade and geological continuity indices to distinguish between Measured, Indicated and Inferred Mineral Resources</li> </ul> | <p>According to the 2010 KIO Mineral Resource Classification Guideline (quantitative scorecard approach) with CP judgement applied to:</p> <ul style="list-style-type: none"> <li>identify critical factors to be used to evaluate grade and geological continuity. The critical factors increased from 10 to 12 factors in 2013 mainly in the Estimation Confidence Index. The weightings were updated for the Resource Confidence Index for Leeuwfontein, Klipbankfontein, Kapstevél North, Kapstevél South</li> <li>assign weights to establish importance of each parameter</li> <li>determine boundaries of calculated grade and geological continuity indices to distinguish between Measured, Indicated and Inferred Mineral Resources</li> </ul> |
| Grade continuity parameters (and associated weighting)    | Fe estimate slope-of-regression (50%);<br>Sample representivity index (50%)  | Fe estimate slope-of-regression (50%);<br>Sample representivity index (50%)  |
| Geometry continuity parameters (and associated weighting) | Distance to closest sample (40%), variability in ore body dimension (20%), variability in ore body structure (20%) and density (real or inferred) (20%)  | Distance to closest sample (40%), variability in ore body dimension (20%), variability in ore body structure (20%) and density (real or inferred) (20%)  |
| Geological confidence                                     |  |  |
| • Grade continuity weighting (%)                          | 40   | 40   |
| • Geometry continuity weighting (%)                       | 60   | 60   |
| <b>Confidence index cut-offs within 1 to 9 range</b>      |  |  |
| • Measured  | ≥6.5   | ≥6.5   |
| • Indicated   | 5.0 to <6.5  | 5.0 to <6.5  |
| • Inferred  | <5.0   | <5.0   |
| CP over-ride  |  |  |
| • Measured to Indicated (Mt)                              | None   | None   |
| • Indicated to Inferred (Mt)                              | None   | None   |
| <b>Estimator</b>  |  |  |
| Resource estimator  | P Letsie   | Johan van Zyl  |
| Resource estimator status                                 | Internal Technical Specialist  | External Technical Specialist  |
| Estimator employer  | Sishen Iron Ore Company Proprietary Limited  | Golder Associates  |

# Ancillary Reserve and Resource information per operation cont.

## Sishen

### Location

The bulk of KIO's annual production is generated by Sishen, located in the Northern Cape province near the town of Kathu in South Africa (**Figure 24**). Sishen has been in operation since 1953 and is one of the largest single open-pit iron ore mines in the world.

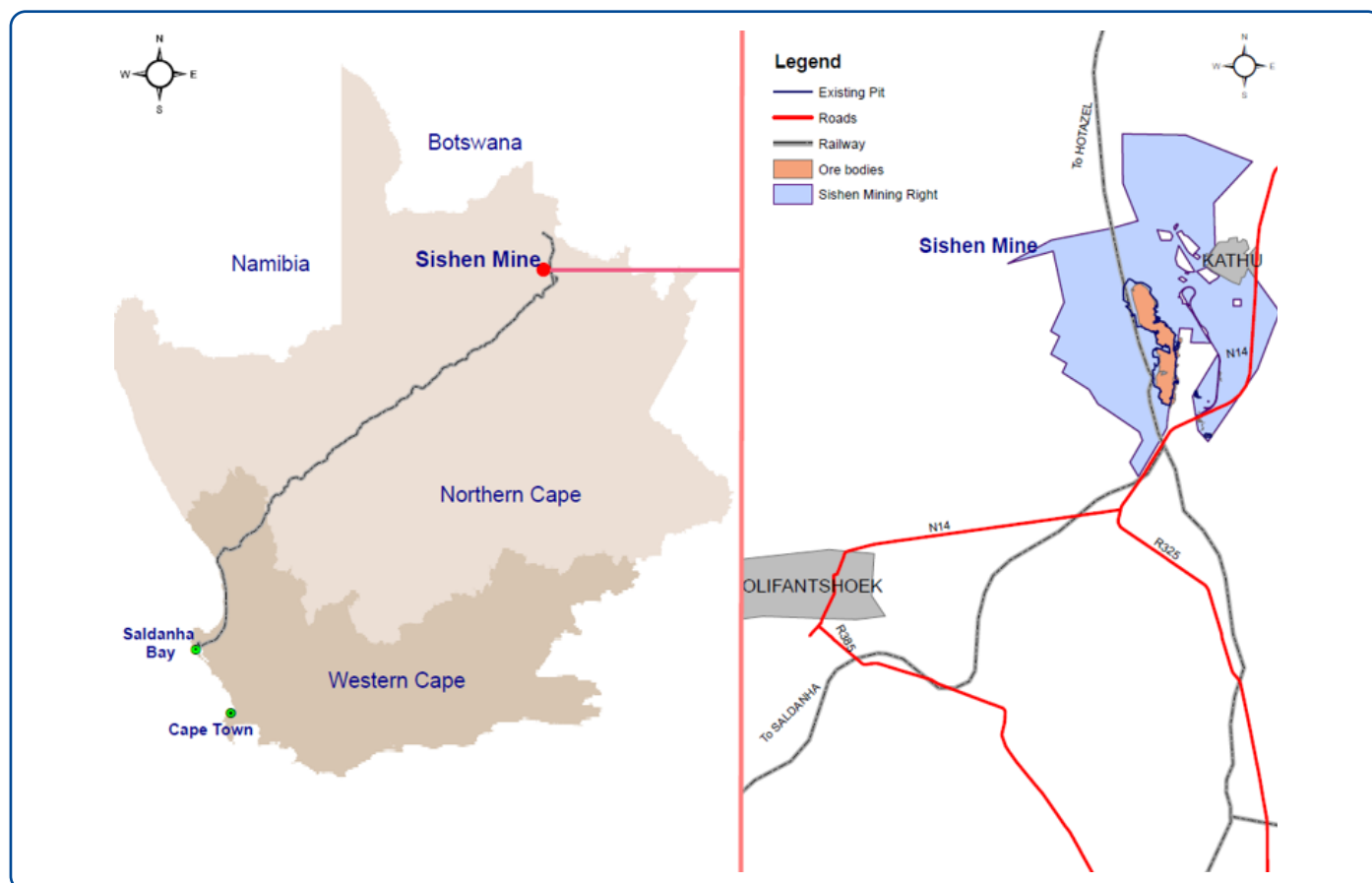


Figure 24: Location and logistics chain of Sishen

## Geological outline

### Regional geology

Falls within the same regional geological environment (towards northern end of Northern Cape province "iron ore belt") as Kolomela – please see Kolomela "Regional geology" section (pages 41 to 43).

### Stratigraphy

The carbonates of the Campbell Rand Subgroup are separated from the overlying BIF of the Asbestos Hills Subgroup by a siliceous, residual breccia. This breccia is known locally as the Wolhaarkop Breccia and is developed on an irregular, karst surface.

The BIFs of the Asbestos Hills Subgroup are characteristically fractured and brecciated, especially near the contact with the Wolhaarkop Breccia. Both upper and lower contacts are erosion surfaces and together with the lack of easily identifiable marker horizons make correlation of individual beds virtually impossible.

A highly altered, slickensided, intrusive sill is commonly found separating the BIF from the overlying laminated ore. At Sishen mine it is generally less than 2m thick. The sill is invariably folded into the basinal geometry and only rarely cross-cuts (intrudes) the ore bodies.

At the Sishen deposit, the upper parts of the Asbestos Hills Subgroup have been ferruginised to ore grade. These stratiform, laminated and massive ores constitute the bulk of the resource. The laminated and massive ores are commonly folded and faulted into basinal and pseudo-graben structures.

Deep palaeo-sinkholes, filled with brecciated ore and Gamagara sedimentary rocks, are found on the southern parts of the Sishen properties. The sinkholes are restricted to antiformal structures close to the Maremane Dome on the southern portions of the mine. They are an important mechanism for preserving collapse breccia ore.

They are unconformably overlain by a thick package of sedimentary rocks (conglomerates, shales, flagstones and quartzite) termed the Gamagara Subgroup (S.A.C.S., 1995). Many researchers including Beukes and Smit (1987) and Moore (pers. comm.) have correlated this unit with the Mapedi Formation, which constitutes the lowermost unit of the Olifantshoek Supergroup.

The Olifantshoek Supergroup is the oldest recognised red-bed sequence in the region. It is some 400 Ma younger than the Transvaal Supergroup.

Conglomerates of ore grade with well-rounded clasts and fine-grained, well-sorted, gritty ores are common at Sishen mine. Partly ferruginised shales, interbedded with ore conglomerates and thick flagstones are also a feature of the Gamagara Subgroup.

Along the western margin of Sishen mine, diamictite of the Makganyene Formation and lavas of the Ongeluk Formation have been thrust over the sedimentary rocks of the Gamagara Subgroup. The diamictite and lava have been eroded by later events. Tillite of the Dwyka group and pebble beds, clay and calcrete of the Kalahari group have been deposited on these erosional unconformities.

A few thin, diabase dykes with north-south and northeast-southwest orientations have intruded the stratigraphic sequence. They form impervious barriers and compartmentalise the groundwater.

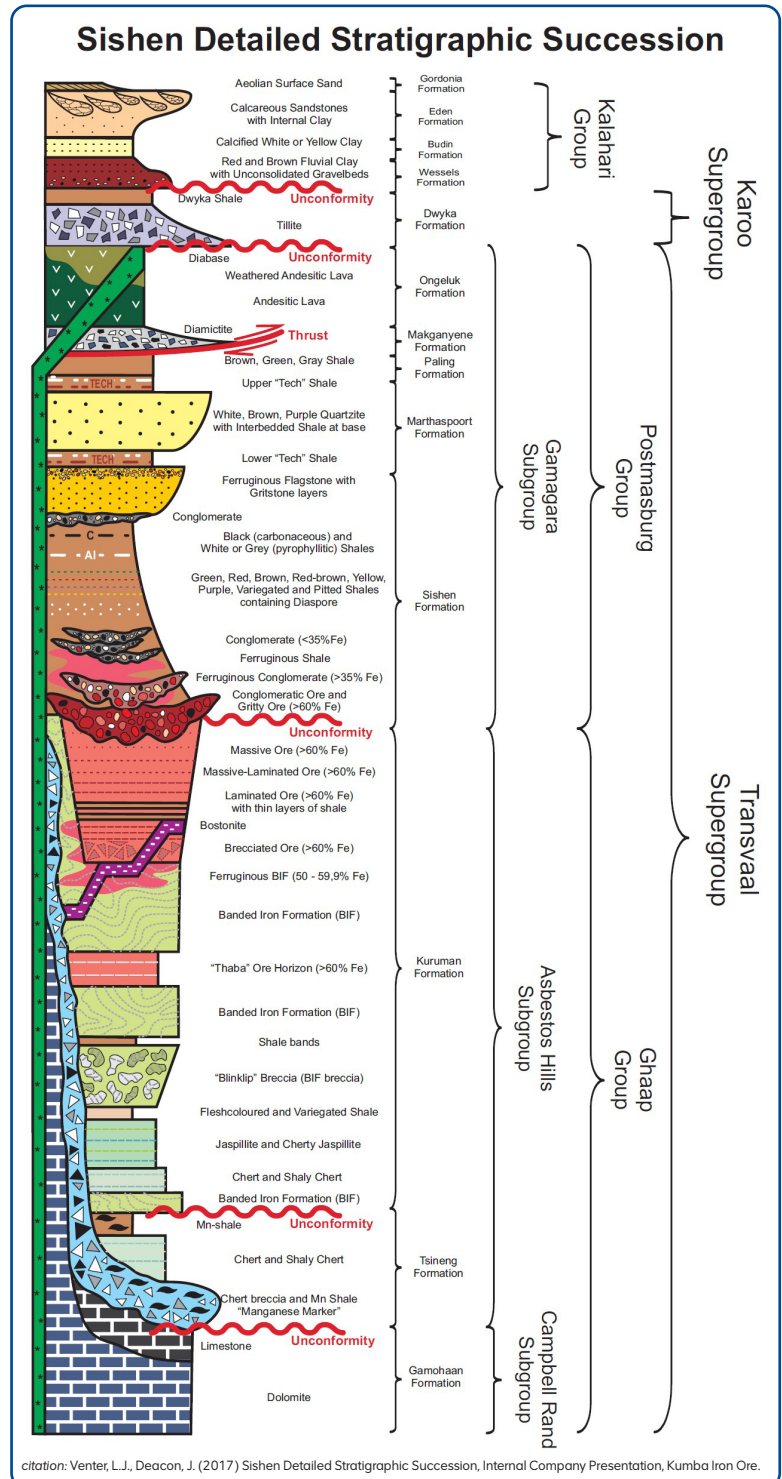


Figure 25: Simplified stratigraphic column depicting the Sishen local geology

# Ancillary Reserve and Resource information per operation cont.

## Geological outline continued

### Stratigraphy continued

A buried glacial valley, filled with Dwyka tillite and mudstones, has been identified with reconnaissance drilling. The valley is located between the mine and Kathu. It has a north-south orientation that changes to northwest-southeast between Dibeng and the mine. The valley does not fall within the planned open pit.

The Kalahari group comprises boulder beds, clays, calcrete, dolocrete and windblown sands. The Kalahari group is developed to a maximum thickness of 60 m. The clay beds at Sishen can attain a thickness of up to 30 m on the northern parts of the deposit. The Kalahari beds of calcrete, limestone and clay and Quaternary sand and detritus, blanket more than 90% of the Sishen mining area.

A generalised version of the Sishen mine stratigraphy is depicted in **Figure 25**.

### Tectonic setting

Structural studies by Stowe (1986), Altermann and Hålbich (1991) and Hålbich *et al* (1993) concluded that the lower Transvaal Supergroup exhibits at least three major phases of compressional tectonism at the western edge of the Kaapvaal Craton. The overall number of events may be significantly higher; for example, Altermann and Hålbich (1991) suggested that there were seven events.

The development of this part of the Kaapvaal Craton is summarised below, in chronological order and using current azimuths, from Stowe (1986), Altermann and Hålbich (1991), Hålbich *et al* (1993), Friese (2007a, b) and Friese and Alchin (2007):

- ~2.78 – 2.64 Ga: Ventersdorp rift basin development. Northeast-southwest trending faults, which formed graben boundaries, developed due to basin initiation and subsidence
- ~2.64 – 2.6 Ga: Extrusion and deposition of the volcano sedimentary Vryburg Formation and Ventersdorp lavas
- ~2.60–2.52 Ga: Development of a carbonate platform, during widespread marine transgression; consequent conformable deposition of the Schmidtsdrif and Campbell Rand Subgroup dolomites
- ~2.52 – 2.46 Ga: Off-craton/oceanic rifting to the west, accompanied by hydrothermal deposition of manganiferous chert of the Wolhaarkop Formation. This was followed by deposition of the Asbestos Hill Subgroup (BIF/Kuruman Formation)
- ~2.46 – 2.35 Ga: Incipient break-up and rifting, along a set of north-south trending, west dipping normal faults in the Kaapvaal Craton during a “second extensional stage” (Friese and Alchin, 2007). According to Dalstra and Rosière (2008), “E1” or their first extensional event occurred immediately before the “Kalahari Orogeny”
- ~2.35 – 2.25 Ga: The first phase of folding (F1) resulted from the E-verging “Kalahari Orogeny”. Altermann and Hålbich (1991) cite the >2.24 Ga or pre-Makganyene development

of the Uitkomst cataclasite as part of this event, which they attribute to a bedding-parallel thrust. F1 folds were predominantly north-south trending; therefore, the main axis of the Maremane Dome is effectively a 2.35 – 2.25 Ga F1 anticline or an F2-tightened F1 anticline. Pre-existing, predominantly rift-related normal faults were inverted and underwent a component of strike-slip reactivation, concomitant with this eastward tectonic vergence; their adjacent, uplifted blocks were eroded. An additional feature of this event appears to be the formation of conjugate north-east and south-east trending strike-slip faults, which are radially distributed around the eastern curve of the Maremane Dome. This orogeny also caused uplift and erosion of underlying units, including the Ghaap group, to form the Postmasburg Unconformity, which is pivotal in regional ore development and/or preservation. The deposition of the Makganyene Formation of the Lower Postmasburg group, which has a minimum age of 2.22 Ga, probably resulted from this event

- ~2.24 – 1.83 Ga: Reactivation of faults related to both the north-south trending passive margin rift and the Ventersdorp Rift, causing deposition of the fault-controlled or fault-bounded, volcano sedimentary/volcanoclastic Upper Postmasburg group. Ongeluk lavas signify the peak of mafic lava extrusion at c. ~2.22 Ga, via feeder dykes that exploited reactivated NNE to NE trending faults (Friese and Alchin, 2007; **Figure 1**). Dalstra and Rosière (2008) correctly inferred that dykes locally recrystallised ores. Within this interval, deposition of clastic sediments in the form of conglomerate, “grit”, quartzite and shale of the lower Olifantshoek Supergroup took place at ~2.05 – 1.93 Ga, thereby forming and terminating the deposition of the Gamagara/Mapedi Formation, which formed within a shallow-water rift environment (Beukes, 1983). The second extensional event or “E2” of Dalstra and Rosière (2008) occurred during or shortly after this period, as reactivated normal faults displaced or offset the lower Olifantshoek group, although such structures tend to pre-date the Kheis Orogeny (see below). Apparently overlapping in age with this extensional event is the formation of south-verging folds and thrusts, which, according to Altermann and Hålbich (1991), are the oldest post-Matsap event at 2.07 – 1.88 Ga
- ~1.83 – 1.73 Ga: The Kheis Orogeny or tectono-metamorphic event, like the Kalahari Orogeny, showed eastward tectonic vergence that was accompanied by thrusting and folding (Stowe, 1986; Beukes and Smit, 1987; Altermann and Hålbich, 1991; Hålbich *et al* (1993)). The Kheis Orogeny is more precisely dated at ~1,780 Ma, using a <sup>39</sup>Ar – <sup>40</sup>Ar metamorphic age derived from the Groblershoek Schist Formation of the Olifantshoek Supergroup (Schlegel, 1988). Rift structures of the Postmasburg group and Olifantshoek Supergroup depositional settings were reactivated while F2 folding and thin-skinned thrusting occurred along major unconformities and lithological contacts. In some areas, F1 folds were tightened co-axially during F2 folding. In the Sishen area, thrusting was concentrated at the shale-dominated, tectonised margins of a quartzite member within the upper



Olifantshoek group; these horizons are termed “tectonised shale” in drill core, although this sequence appears to be very poorly developed at the Heuningkranz prospect. Friese (2007a, b) and Friese and Alchin (2007) have termed these and other low-angle thrusts “principal décollements”

- ~1.15 – 1.0 Ga: The north-north-east directed Lomanian (Namaqua-Natal) Orogeny caused deformation along the southern margin of the Kaapvaal Craton. The effects of this were manifold: reactivation and buckling of north-south trending normal and inverted normal faults, reactivation of the 2.35 – 2.24 Ga north-east and south-east trending conjugate strike-slip faults, usually with upthrow to the south-east and south-west, respectively, the development of east-north-east trending F3 folds, which may have contributed to broad F2/F3 fold interference patterns (q.v. Mortimer, 1994, 1995). This may also have contributed to the geometry of the Maremane Dome, which is effectively a large-scale “Ramsay style” interference fold with a radial set of fractures/faults, in which conjugate relationships may still be observed. The Dimoten and Ongeluk-Witwater Synclines, wherein the Postmasburg group is preserved, are situated towards the eastern foreland of the Maremane Dome.

It has been suggested that the interference or intersection of F2 synclines and F3 synclines have resulted in deep, steep-sided, circular or ovoid depressions in which ore (and BIF) is notably thicker (e.g. Mortimer, 1994; 1995). This must be weighed against other models which suggest that areas of very thick, deep ore occupy palaeo-sinkholes, i.e. occur within palaeokarst topography within the Campbell Rand Subgroup (Beukes *et al* (2002)).

A third model is that of Dalstra and Rosière (2008), which advocates a close association between structures and mineralisation and/or between structures and the preservation of mineralisation. Due to the complex structural and stratigraphic evolution of the area, it is entirely possible that there is a component of all three mechanisms present in a given deposit, albeit substantially complicated by variable preservation.

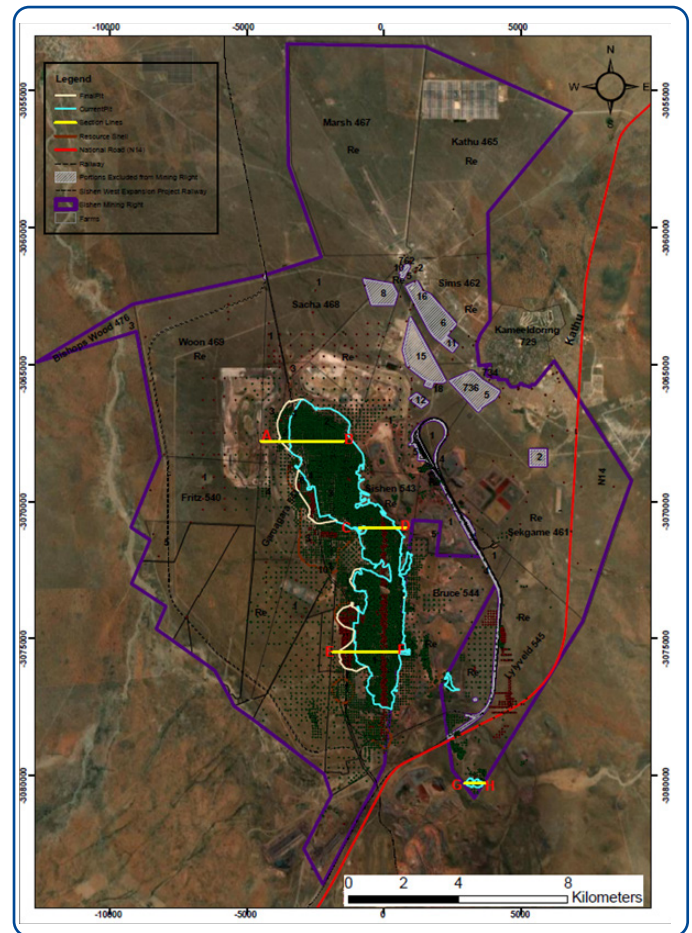
Subsequent tectonism, including the break-up of Gondwana and Pan-African reworking, had only a minor effect on the modelled volume. Regionally, Bushveld-age gabbroic rocks intruded into the Ghaap and Postmasburg groups within a clearly defined north-east trending graben, essentially accommodated by the reactivation of Ventersdorp faults (Friese and Alchin, 2007).

### Local geology

A total of 10,009 additional borehole sample log and assay data (325,205 in total) was applied in the update of the 2021 Sishen geological model, 70% thereof derived from cored boreholes and 30% from percussion boreholes (insignificant RC drilling). Drill coverage is illustrated in **Figure 26** and is evident of a highly developed understanding of the mineral asset.

Sishen mine is situated on the northern extremity of the Maremane anticline. At this location the lithologies strike north-south and plunge from the centre of the anticline in a northerly direction. The bulk of the resource comprises high-grade, laminated and massive ores belonging to the Asbestos Hills Subgroup.

The ore bodies are intensely folded and faulted. Dips vary according to local structures, but at Sishen, a regional dip of 11° in a westerly direction prevails.



**Figure 26: Sishen mining right area**

The geometry of the lithologies are depicted via cross-sections (referenced in Figure 21) taken through the latest 3D Sishen geological model:

- **Figure 27** is a west to east cross-section (line AB in **Figure 26**) through the Sishen north mine area.
- **Figure 28** is a west to east cross-section (line CD in **Figure 26**) through the Sishen middle mine area.
- **Figure 29** is a west to east cross-section (line EF in **Figure 26**) through the Sishen south mine area.
- **Figure 30** is a west to east cross-section (line GH in **Figure 26**) through the Lylyveld satellite mine area.

It can be noticed in some of these figures that the pit layout boundaries in some instances exceed the resource shell in size. This is possible where during pit optimisation ore geology is the limiting factor and not economic viability, and when the pit shell is engineered into a safe pit layout or design, the layout boundaries in some areas exceed the resource shell.

Also, the vertical scale has been exaggerated in all the cross-sections, for better illustrative purposes, resulting in ore body dip angles appearing steeper than actual.

# Ancillary Reserve and Resource information per operation cont.

## Geological outline continued

### Local geology continued

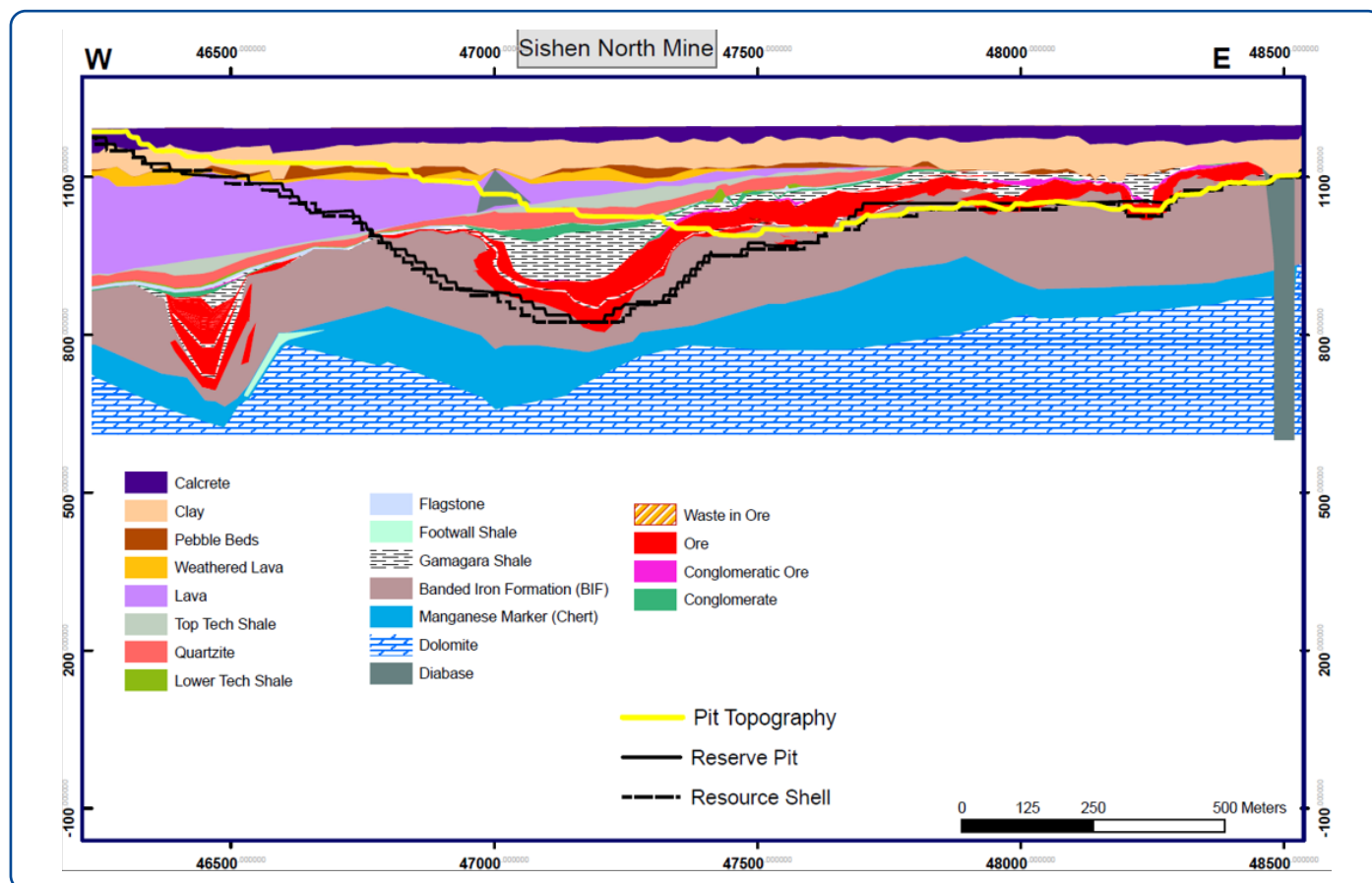


Figure 27: West-east cross-section depicting the local geology of the Sishen north mine area

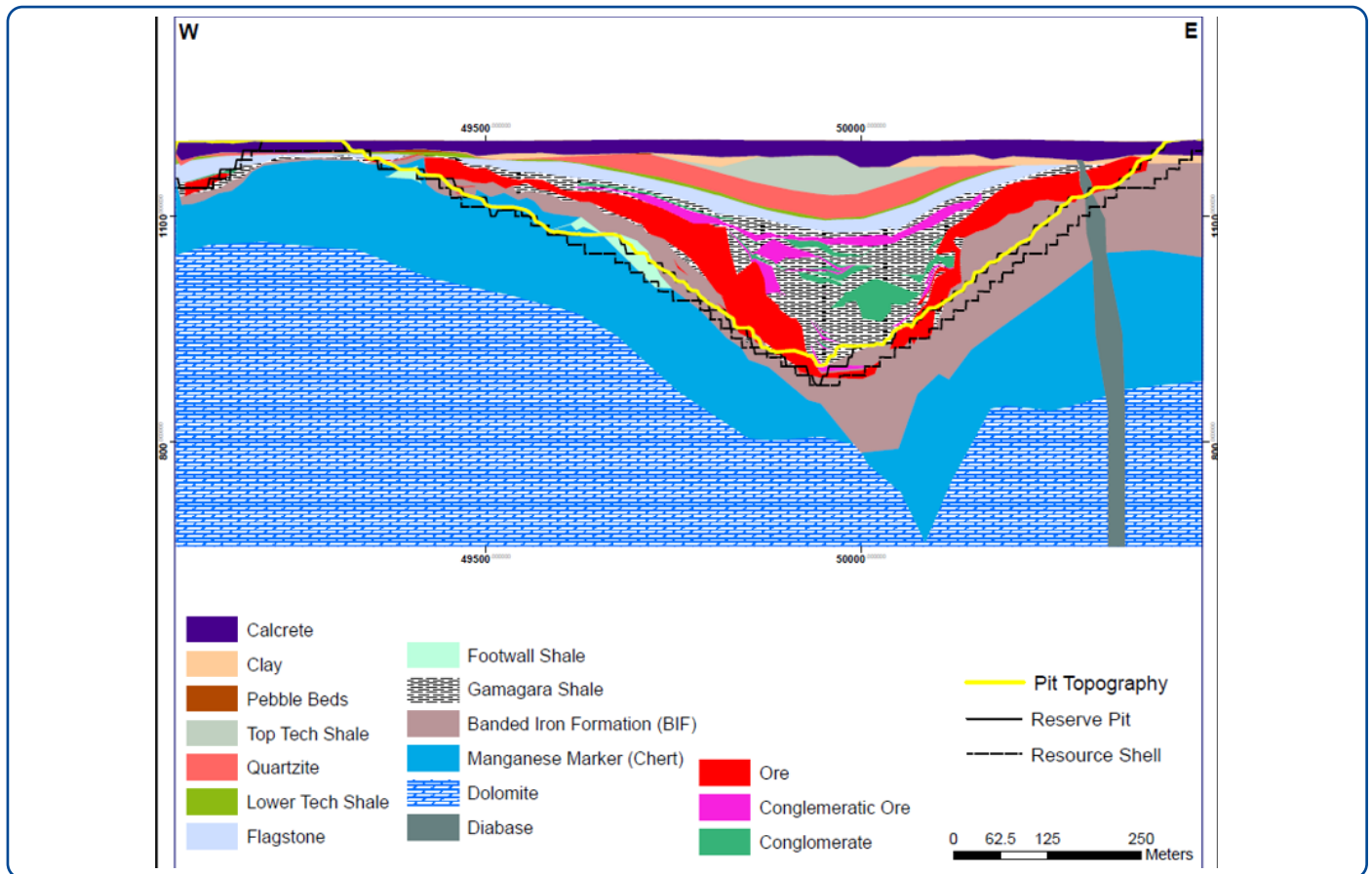


Figure 28: West-east cross-section depicting the local geology of the Sishen middle mine area

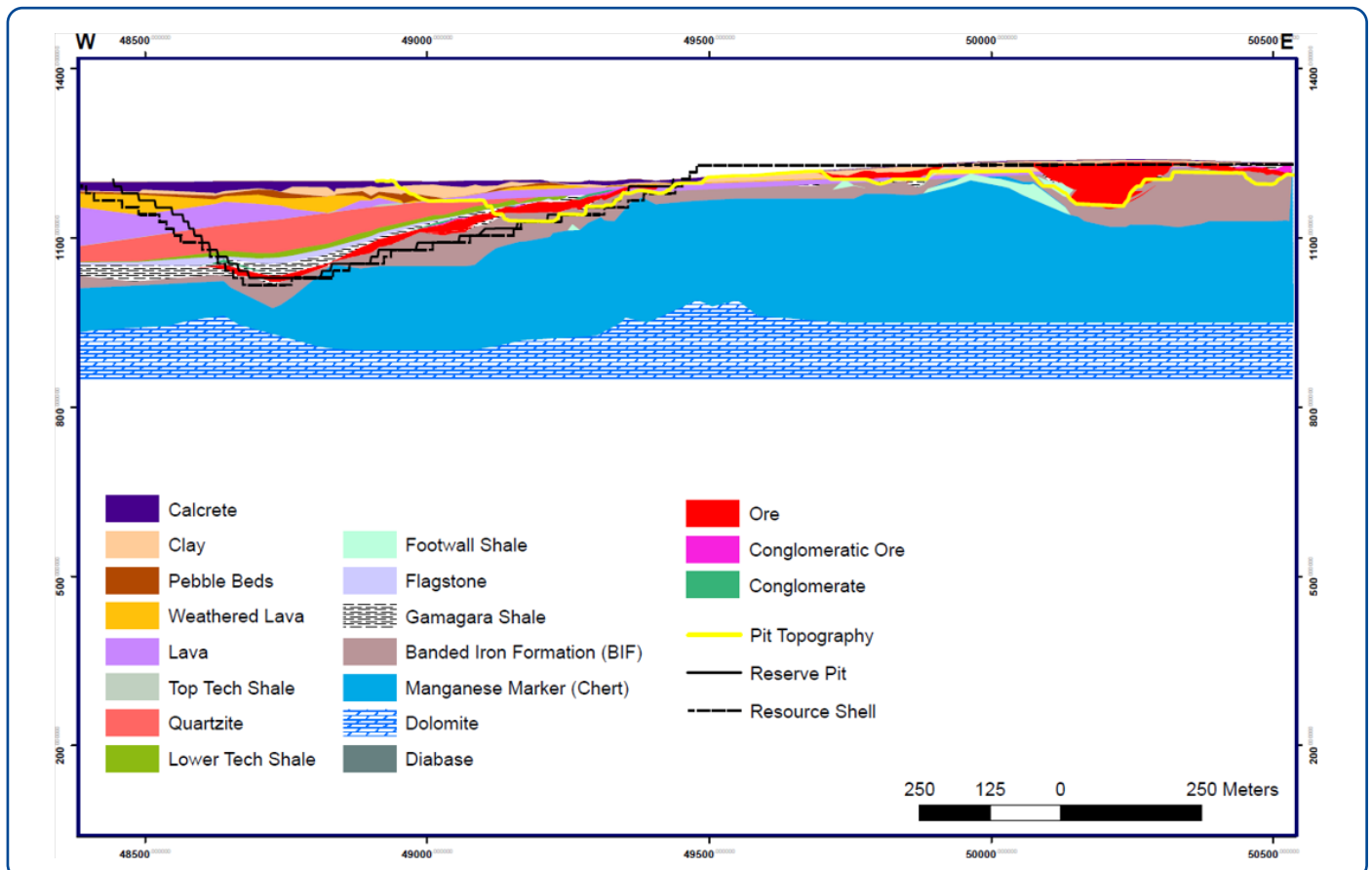


Figure 29: West-east cross-section depicting the local geology of the Sishen north mine area

# Ancillary Reserve and Resource information per operation cont.

## Geological outline continued

### Local geology continued

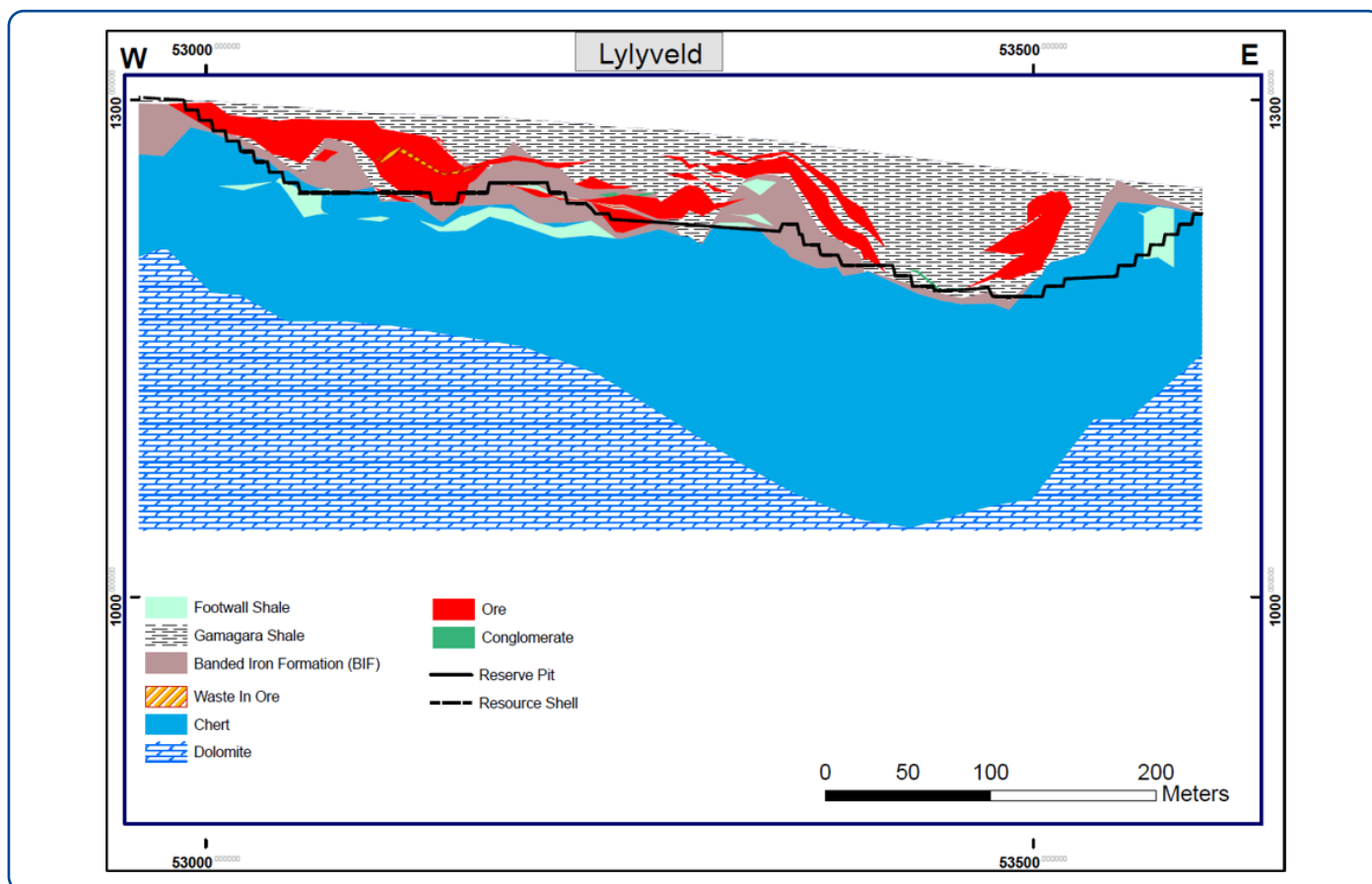


Figure 30: West-east cross-section depicting the local geology of the Sishen Lylyveld satellite mining area

### Operational outline

Sishen mine currently comprises a conventional open-pit operation, processing run-of-mine through two primary processing facilities:

- A DMS plant
- A Jig plant that includes a modular UHDS facility, treating a portion of the Jig plant discard stream

The combined run-of-mine capacity of the processing facilities is currently 49.7 Mtpa (28.1 Mtpa for the DMS plant and 21.6 Mtpa for the Jig plant).

It is foreseen that the DMS beneficiation capability is going to be improved in the future, with the construction of a UHDS facility to cater for the beneficiation of low-grade ore as per the Sishen UHDS project. The 2022 LoAP (2021 LoAP depleted for 2022 and corrected for run-of-mine and Saleable Product mined less than the planned figures for 2022) scheduled low-

grade material as run-of-mine from 2035 until 2039 (end of the reserve life). It is foreseen that this may change in future LoAP schedules with low-grade ore being scheduled as run-of-mine at an earlier stage.

The current mining process entails topsoil removal and stockpiling for later use during the waste dump rehabilitation process, followed by drilling and blasting of waste and ore. The waste material is in-pit dumped where such areas are available or hauled to waste rock dumps. The iron ore is loaded according to blend (grade) requirements and hauled to designated run-of-mine buffer stockpiles or the beneficiation plants, where it is crushed, screened and beneficiated.

Plant slimes are not beneficiated and are pumped to evaporation dams while the DMS and Jig (and UHDS) discard material is stacked on a plant discard dump.



Three final iron ore products (derived from up to seven interim products produced on-site conforming to different chemical and physical specifications) are produced. The product is reclaimed from product beds and loaded into trains to be transported either to local steel mills (domestic market) and Saldanha Bay (for export market), from where it is shipped together with Kolomela product and sold to international Clients under three KIO-branded products referred to as premium Lump ore, standard Lump ore and standard Fines ore.

KIO has an agreement with ArcelorMittal to supply it domestically with a maximum of 6.25 Mtpa of Saleable Product. Recent off-take has however not matched the maximum contract levels and most of the Sishen production is exported via the Saldanha Bay port to various international steel markets.

Sishen's key operational parameters are summarised in **Table 11**.

**Table 11: Sishen operational outline summary**

| Key details   | 2022<br>8+4 forecast (actual)  | 2021<br>9+3 forecast (actual)  |
|---|--|--|
| % Ownership (AA plc)  | 52.5   | 53.2   |
| % Ownership (KIO)   | 75.4   | 76.3   |
| Commodity   | Iron ore   | Iron ore   |
| Country   | Republic of South Africa   | Republic of South Africa   |
| Mining method(s)  | Open-pit – Conventional  | Open-pit – Conventional  |
| Beneficiation method(s)   | DMS and Jigging  | DMS and Jigging  |
| Reserve life* (years)   | 17   | 18   |
| Estimated Saleable Product Lump : Fine ratio  | 70 : 30  | 70 : 30  |
| Saleable Product design capacity (Mt)   | 34.7   | 34.7   |
| Forecasted <sup>s</sup> and (actual) run-of-mine production (Mt dry)<br><i>including modified Inferred Mineral Resources</i>        | 35.8 (35.4 actual)<br>(0.4 Mt run-of-mine mined outside the pit layout and resource shell and 0.4 Mt modified Inferred Mineral Resources)  | 37.9 (37.9 actual)<br>(4.4 Mt run-of-mine mined outside the pit layout and resource shell and 0.6 Mt modified Inferred Mineral Resources)  |
| Forecasted <sup>s</sup> and (actual) Saleable Product (Mt dry)<br><i>including modified beneficiated Inferred Mineral Resources</i> | 26.5 (26.6 actual)<br>(0.3 Mt produced from Mineral Resources extracted outside the pit layout and 0.3 Mt modified beneficiated Inferred Mineral Resources)  | 28.1 (28.0 actual)<br>(3.3 Mt produced from run-of-mine extracted outside the pit layout and resource shell and 0.4 Mt modified beneficiated Inferred Mineral Resources)   |
| Forecasted <sup>s</sup> and (actual) waste production (Mt dry)  | 152.7 (156.8 actual)   | 154.0 (146.1 actual)   |
| Forecasted <sup>s</sup> and (actual) railed product (Mt dry)  | 26.9 (25.6 actual)   | 26.9 (27.3 actual)   |
| Overall LoAP planned stripping ratio  | 3.3 : 1  | 3.3 : 1  |
| Product types   | In total four Lump and three Fines product types of varying grade is produced on-site but sold as three products under the Kumba branding together with Kolomela product as Kumba premium Lump, Kumba standard Lump and Kumba standard Fines | In total four Lump and three Fines product types of varying grade is produced on-site but sold as three products under the Kumba branding together with Kolomela product as Kumba premium Lump, Kumba standard Lump and Kumba standard Fines |
| Mining right expiry date  | 10 November 2039   | 10 November 2039   |

\* Reserve life represents the period in years in the approved LoAP for scheduled processing of Proved and Probable Reserves, where the Proved and Probable Ore Reserves makes up >25% of the year's run-of-mine. Should the LoAP exceed the mining right expiry date, the Reserve life is just quoted until the expiry date.

<sup>s</sup> The forecasted figures align with the year-on-year Reserve and Resource movement figures as the site Reserve and Resource Statements are reported end October to allow for sufficient internal (Kumba) and independent internal (Anglo) and external (Exxaro) peer reviews before final Reserve and Resource figures are published.

## For 2022

It is estimated at the time of reporting (8+4 forecast) that 194.4 Mt (152.7 Mt waste, including low-grade ore mined to buffer stockpiles and 41.7 Mt ex-pit ore) would be mined in 2022 compared to 184.0 Mt (146.1 Mt ex-pit waste including C-grade and 37.9 Mt ex-pit ore) in 2021. The ex-pit waste (including low-grade ore) to ex-pit ore ratio has decreased from 3.9 : 1 in 2021 to 3.6 : 1 in 2022.

From the 41.7 Mt ex-pit ore, 35.8 Mt (including 0.8 Mt modified Mineral Resources) is foreseen to be delivered as run-of-mine to the plants. An estimated 3.5 Mt increase in run-of-mine buffer

stockpile levels are expected, primarily as a result of 6.6 Mt of low-grade material mined from the pit to stockpiles not utilised as run-of-mine in 2022, outweighing the -3.1 Mt (+6.7 Mt from pit to stockpiles and -9.8 Mt from stockpiles to plants) forecasted annual decrease in high- and medium-grade run-of-mine stockpile levels.

The resulting 2022 Saleable Product is estimated (8+4 forecast) at 26.5 Mt (including 0.6 Mt produced from beneficiated modified Inferred Mineral Resources) at an average annual yield of 74.0%. The forecasted sales for 2022 are 26.9 Mt.



# Ancillary Reserve and Resource information per operation cont.

## Operational outline continued

### Production history

The historical production (actual depletion of Saleable Product tonnes) of Sishen mine is summarised in **Figure 31**.

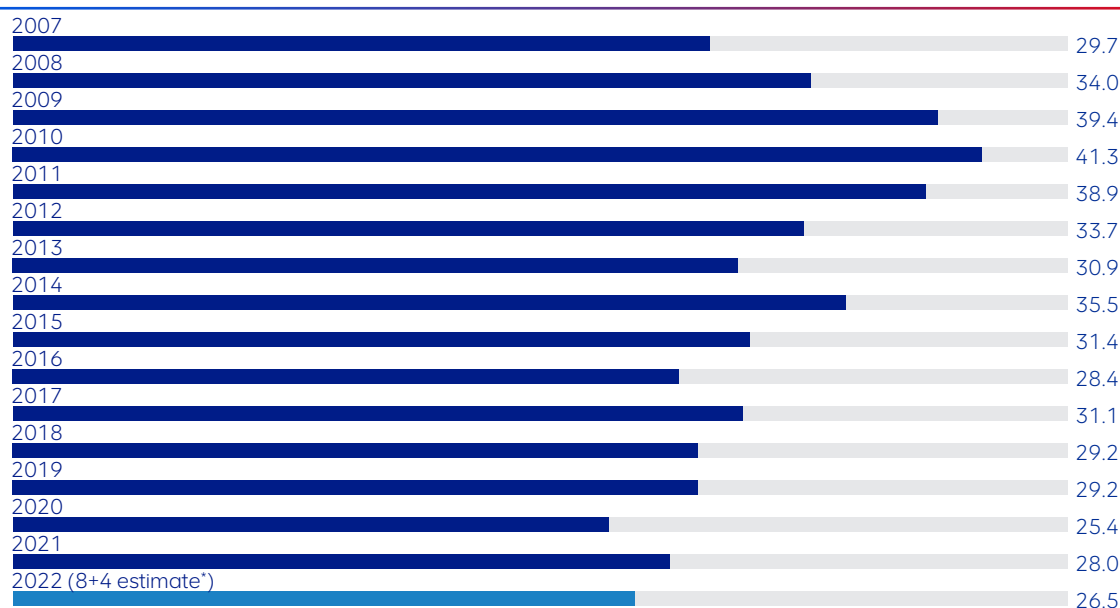


Figure 31: Sishen mine production history

### Life-of-asset plan (LoAP) Saleable Product profile

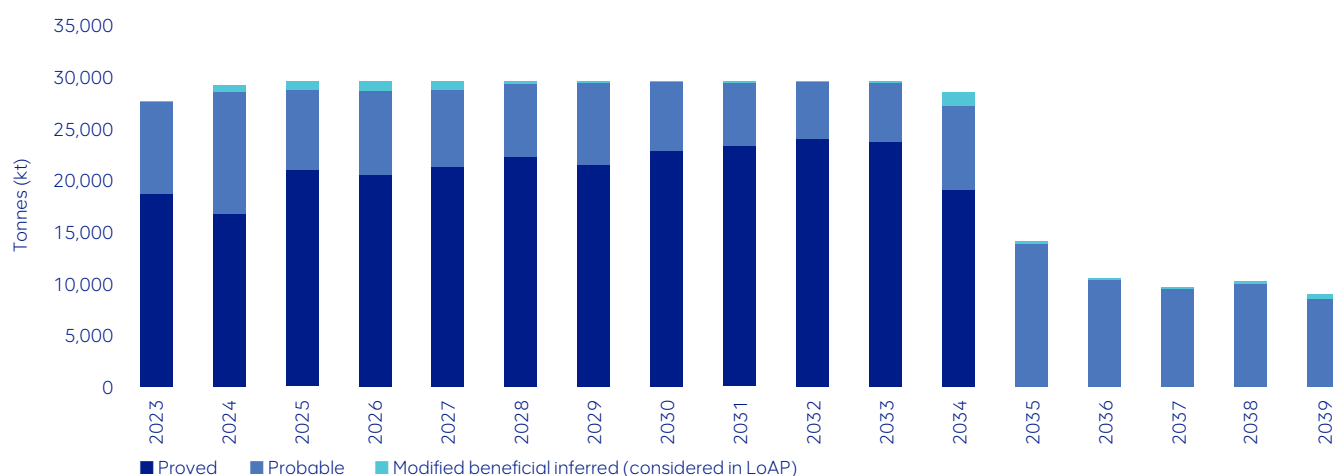


Figure 32: Sishen mine's 2022 LoAP Saleable Product profile (including modified beneficiated Inferred Mineral Resources)

## Ore Reserve ancillary information

The Sishen Ore Reserve ancillary information is summarised in **Table 12A** (background information) and **Table 12B** (main pit Ore Reserve estimation parameters – as an example).

**Table 12A:** Sishen's 2022 versus 2021 Ore Reserve background information

| Sishen  | 2022  | 2021  |
|---|---|---|
| <b>Location</b>   |   |   |
| Country   | Republic of South Africa  | Republic of South Africa  |
| Province  | Northern Cape   | Northern Cape   |
| <b>Ownership</b>  |   |   |
| Sishen Iron Ore Company Proprietary Limited             | 100%  | 100%  |
| Kumba Iron Ore Limited                                  | 75.4%   | 76.3%   |
| AA plc  | 52.5%   | 53.2%   |
| <b>Operational status</b>                               |   |   |
| Operation status  | Steady-state  | Steady-state  |
| Mining method   | Open-pit (conventional drilling and blasting and truck-and-shovel operation)  | Open-pit (conventional drilling and blasting and truck-and-shovel operation)  |
| Beneficiation method                                    | DMS and Jig beneficiation and modular UHDS associated with the Jig discard  | DMS and Jig beneficiation and modular UHDS associated with the Jig discard  |
| Average annual Saleable Product in LoAP (Mtpa)          | 23.9  | 24.0*   |
| Average annual supply to domestic market in LoAP (Mtpa) | 0.5   | 0.5   |
| Average annual supply to export market in LoAP (Mtpa)   | 23.4  | 23.5*   |
| Number of products                                      | Three final Saleable Products from Saldanha: premium Lump, standard Lump and standard Fines, but with more intermediate products produced at Sishen   | Three final Saleable Products from Saldanha: premium Lump, standard Lump and standard Fines, but with more intermediate products produced at Sishen |
| <b>Governance</b>                                       |   |   |
| Code  | THE SAMREC CODE – 2016 EDITION  |   |
| AA plc group policy                                     | <a href="https://www.angloamericankumba.com/~media/Files/A/Anglo-American-Group/Kumba/sustainability/approach-and-policies/kumba-mineral-resource-and-ore-reserve-reporting-policy.pdf">https://www.angloamericankumba.com/~media/Files/A/Anglo-American-Group/Kumba/sustainability/approach-and-policies/kumba-mineral-resource-and-ore-reserve-reporting-policy.pdf</a> |   |
| AA plc requirements document                            | AA_RD_22-25 - Version 12 [2021] - (Exploration results, Mineral Resources and Ore Reserves reporting requirements document)   | AA_RD_22-25 - Version 12 [2021] - (Exploration results, Mineral Resources and Ore Reserves reporting requirements document)                         |
| KIO reporting protocols                                 | KIO Reserve classification guideline (Version 1)  |   |
| KIO reporting template                                  | Ore Reserve (and Saleable Product) reporting template (2022)  | Ore Reserve (and Saleable Product) reporting template (2021)  |

\* The 2021 average annual Saleable Product in LoAP (Mtpa) was incorrectly indicated as 29.7 Mtpa (instead of 24.0 Mtpa), and the average annual supply to export market in LoAP was incorrectly indicated as 29.2 Mtpa (instead of 23.5 Mtpa).

# Ancillary Reserve and Resource information per operation cont.

## Ore Reserve ancillary information continued

**Table 12A (continued):** Sishen's 2022 versus 2021 Ore Reserve background information

| Sishen  | 2022   | 2021   |
|---|--|--|
| <b>Reporting method</b>   |  |  |
| Approach  | <p>Ore Reserves are those derived from Measured and Indicated Mineral Resources only (through application of modifying factors) and do not include Inferred Mineral Resources. In the case of KIO, all Ore Reserves are constrained by practical pit layouts, mining engineered from pit shells that define "current economically mineable"</p> <p>The geological block model(s) is converted into a mining block model considering a site-specific practical mineable smallest mining unit. Furthermore protocols ensure that KIO's operations/projects consider expected long-term revenues versus the operating and production costs associated with mining and beneficiation as well as legislative, environmental and social costs, in determining whether or not a Mineral Resource could be economically extracted and converted to an Ore Reserve. This is performed by applying a Lerchs-Grossmann algorithm to the mining model to derive an optimised pit shell. This optimised pit shell is then iteratively converted to a practical layout by applying geotechnical slope stability parameters and haul road and ramp designs, legal restrictions, etc., with safety being one of the most considered parameters. Once a practical pit layout has been established the material within the pit is scheduled over time to achieve Client specifications and thus an LoA schedule is produced</p> <p>The average % Fe grade and metric tonnage estimates of "Saleable Product" are also reported to demonstrate that beneficiation losses have been taken into account</p> |  |
| Scheduled run-of-mine metric tonnes (dry/wet)   | Dry  | Dry  |
| Tonnage calculation   | Tonnages are calculated from the LoAP schedule, originating from the mining block models, and are modified tonnages considering geological losses, the effect of dilution, mining losses, mining recovery efficiencies and design recovery efficiencies to derive the run-of-mine tonnages delivered to the crushing and screening plant   |  |
| Fe grade  | Ore Reserve % Fe grades reported, represent the weighted average grade of the "plant feed" or run-of-mine material and take into account all applicable modifying factors  |  |
| Cut-off grade (Fe)  | 40%  | 40%  |
| Ore type  | Haematite ore  | Haematite ore  |
| Optimised pit shell revenue factor  | 1.0  | 1.0  |
| <b>LoAP scheduling</b>  |  |  |
| Software  | OPMS   | OPMS   |
| Method  | Product tonnage and grade target driven to achieve required Client product specifications  | Product tonnage and grade target driven to achieve required Client product specifications  |
| Stripping strategy  | A stripping strategy that follows a constant annual tonnage target, which remains between the minimum and maximum stripping limits, were chosen for the LoA scheduling. A deferred waste stripping strategy was applied to save costs in the medium term   | A stripping strategy that follows a constant annual tonnage target, which remains between the minimum and maximum stripping limits, were chosen for the LoA scheduling. A deferred waste stripping strategy was applied to save costs in the medium term |
| Reserve life years  | 17   | 18   |
| LoAP run-of-mine tonnes (including modified Inferred) (expressed in million tonnes)   | 629.4  | 664.5  |
| Overall average stripping ratio (including Inferred Mineral Resources)  | 3.3 : 1  | 3.3 : 1  |
| Production data cut-off date (date where after short-term plan instead of actual figures are used to estimate the annual run-of-mine and Saleable Product production for the mine until 31 December of year of reporting) | 30 August 2022   | 30 August 2021   |
| Topography and pit progression assigned   | 31 December 2022   | 31 December 2021   |
| Reserve schedule ID   | 2021_Sishen_LOM_Scenario3_Koketso_s3.5 (Preliminary_Reserves)  | 2021_Sishen_LOM_Scenario3_Koketso_s3.5 (Preliminary_Reserves)  |
| Reserve schedule completion date  | 30 October 2021  | 30 October 2021  |

**Table 12B:** Sishen's 2022 versus 2021 main pit Ore Reserves estimation parameters (a similar table is available for the Lylyveld satellite pit mining area)

| Main Pit   | 2022   | 2021   |
|--|--|--|
| <b>Estimation</b>                                      |  |  |
| Mining block model name                                | north2021_smu_new_v2.dm; south2021_smu_new_v2  | north2021_smu_new_v2.dm; south2021_smu_new_v2  |
| Smallest mining unit                                   | 20 m(X) x 20 m(Y) x 12.5 m(Z)  | 20 m(X) x 20 m(Y) x 12.5 m(Z)  |
| <b>Practical mining parameters</b>                     |  |  |
| Bench height   | 12.5 m   | 12.5 m   |
| Ramp gradient  | 8% (1 in 12.5)   | 8% (1 in 12.5)   |
| Road width   | 30 m to 56 m   | 30 m to 56 m   |
| Minimum mining width                                   | 80 m (rope shovel and truck mining)  | 80 m (rope shovel and truck mining)  |
| Geohydrology   | Groundwater level maintained 12.5 m below pit floor  | Groundwater level maintained 12.5 m below pit floor  |
| Pit slopes   | Designed according to a defensible risk matrix, guided by an appropriate factor of safety of 1.3 and a probability of failure of 10% | Designed according to a defensible risk matrix, guided by an appropriate factor of safety of 1.3 and a probability of failure of 10% |
| <b>Pit optimisation</b>                                |  |  |
| Software   | Whittle 4X   | Whittle 4X   |
| Method   | Lerchs-Grossmann (primary LoA maximisation, secondary NPV maximisation)  | Lerchs-Grossmann (primary LoA maximisation, secondary NPV maximisation)  |
| <b>Modifying factors</b>                               |  |  |
| Geological loss (%)                                    | -1   | -1   |
| Dilution (%)   | 16   | 16   |
| Mining loss (%)  | -10  | -10  |
| Mining recovery efficiency (%)                         | 92   | 92   |
| Design recovery efficiency (%)                         | 99   | 99   |
| Ore Reserves reallocated to Mineral Resources (%)      | 0  | 0  |
| Metallurgical yield (%) to convert to Saleable Product | 64.5   | 65.0   |
| <b>Estimator</b>                                       |  |  |
| Reserve estimator                                      | Izak Moolman   | Izak Moolman   |
| Reserve estimator status                               | Internal Technical Specialist  | Internal Technical Specialist  |
| Estimator employer                                     | Sishen Iron Ore Company Proprietary Limited / Anglo American Proprietary Limited   | Sishen Iron Ore Company Proprietary Limited / Anglo American Proprietary Limited   |

# Ancillary Reserve and Resource information per operation cont.

## Mineral Resource ancillary information

The Sishen Mineral Resource ancillary information is summarised in **Table 13A** (background information) and **Table 13B** [nn1(a to c) geological models' Mineral Resource estimation parameters – as an example].

**Table 13A:** Sishen's 2022 versus 2021 Mineral Resource background information

| Sishen                                      | 2022   | 2021  |
|---|--|---|
| <b>Location</b>                             |  |   |
| Country                                     | Republic of South Africa   | Republic of South Africa  |
| Province                                    | Northern Cape  | Northern Cape   |
| <b>Ownership (%)</b>                        |  |   |
| Sishen Iron Ore Company Proprietary Limited | 100  | 100   |
| Kumba Iron Ore Limited                      | 75.4   | 76.3  |
| Anglo American plc                          | 52.5   | 53.2  |
| <b>Security of tenure</b>                   |  |   |
| Number of applicable mining rights          | 1  | 1   |
| Mining right status                         | Registered (amendments registered)   | Registered (amendments executed)  |
| Mining right expiry date(s)                 | 10 November 2039   | 10 November 2039  |
| <b>Exploration status</b>                   |  |   |
| Exploration type                            | Geological confidence (on-mine)  | Geological confidence (on-mine)   |
| Exploration phase                           | In execution   | In execution  |
| Ore type                                    | Haematite ore  | Haematite ore   |
| <b>Governance</b>                           |  |   |
| Code  | THE SAMREC CODE – 2016 EDITION   |   |
| AA plc group policy                         | <a href="https://www.angloamericankumba.com/~media/Files/A/Anglo-American-Group/Kumba/sustainability/approach-and-policies/kumba-mineral-resource-and-ore-reserve-reporting-policy.pdf">https://www.angloamericankumba.com/~media/Files/A/Anglo-American-Group/Kumba/sustainability/approach-and-policies/kumba-mineral-resource-and-ore-reserve-reporting-policy.pdf</a>  |   |
| AA plc requirements document                | AA_RD_22-25 - Version 13 [2022] - (Exploration results, Mineral Resources and Ore Reserves reporting requirements document )   | AA_RD_22-25 - Version 12 [2021] - (Exploration results, Mineral Resources and Ore Reserves reporting requirements document)   |
| KIO reporting protocols                     | KIO Resource classification guideline (Version 4)  |   |
| KIO reporting template                      | Mineral Resource (and Additional Mineralisation) reporting template (2022)   | Mineral Resource (and Mineral Inventory) reporting template (2021)  |
| <b>Reporting method</b>                     |  |   |
| Approach                                    | Mineral Resources are reported exclusive of Ore Reserves and not factoring in attributable ownership and only if: (1) spatially modelled; (2) spatially classified; (3) spatially constrained in terms of reasonable and realistic prospects for eventual economic extraction (occurring within an RPEEE-defined envelope, in other words not all mineral occurrences are declared as Mineral Resources); and (4) declared within (never outside) executed tenement boundaries |   |
| In situ metric tonnes (dry/wet)             | Dry  | Dry   |
| Tonnage calculation                         | Tonnages are added from cells in geological block model of which the centroids intersect the relevant geological ore domains in the solids models which occur inside the resource shell. The volume of each ore cell is multiplied with the estimated relative density of the same cell  | Tonnages are added from cells in geological block model of which the centroids intersect the relevant geological ore domains in the solids models which occur inside the resource shell. The volume of each ore cell is multiplied with the estimated relative density of the same cell |
| Fe grade                                    | Weighted average above cut-off grade   | Weighted average above cut-off grade  |
| Fe calculation                              | Tonnage-weighted mean of the estimated in situ Mineral Resource Fe grades contained within geological block models, constrained by the relevant Resource geological ore domains and RPEEE resource shell   | Tonnage-weighted mean of the estimated in situ Mineral Resource Fe grades contained within geological block models, constrained by the relevant Resource geological ore domains and RPEEE resource shell  |
| <b>RPEEE</b>                                |  |   |
| Cut-off grade                               | 40% Fe   | 40% Fe  |
| Resource shell revenue factor               | 1.6  | 1.6   |



**Table 13B:** Sishen's 2022 versus 2021 NN1 (A to C) geological models' Mineral Resources estimation parameters – as an example (similar tables exist for the NN2 (A to C), NN3 (A to C), NN4 (A to C), MM1 (A to C), SS1 (A to C), SS2 (A to C), SS3 (A to C), LVD (A to C) and DNV (A to C) geological models but are not stated in this report)

| NN1 (A to C) geological models            | 2022   | 2021   |
|---|--|--|
| Estimation                                |  |  |
| Input data                                |  |  |
| Borehole type                             | Core and percussion borehole lithological logs and associated chemical analyses  |  |
| Relative density measurement              | Minidense (pre-2010) and Picnometer analyses on pulp samples (2010 to present)   |  |
| KIO QA/QC protocol                        | KIO QC Protocol for exploration drilling sampling and sub-sampling (version 10)  | KIO QC Protocol for exploration drilling sampling and sub-sampling (version 9)   |
| Primary laboratory                        | Technical Solutions Division of Anglo Operations Limited Chemistry Laboratory (Company registration number: 1921/006730/07)  | Technical Solutions Division of Anglo Operations Limited Chemistry Laboratory (Company registration number: 1921/006730/07)  |
| Accreditation                             | Accredited under International Standard ISO/IEC 17025:2005 by the SANAS under the Facility Accreditation Number T0051 (valid until 30 April 2026)  | Accredited under International Standard ISO/IEC 17025:2005 by the SANAS under the Facility Accreditation Number T0051 (valid from 1 May 2016 to 30 April 2021)   |
| Borehole database software                | acQuire  | acQuire  |
| Borehole database update cut-off date     | 29 January 2020  | 29 January 2020  |
| Database validation conducted             | Yes  | Yes  |
| Segmentation conducted                    | Yes. To allow for simplification of logged lithologies for spatial correlation purposes  |  |
| Statistical and geostatistical evaluation |  |  |
| Data compositing interval                 | 3 m  | 3 m  |
| Data compositing method                   | Length multiplied with density used to weight per lithology  | Length multiplied with density used to weight per lithology  |
| Grade parameters evaluated                | % Fe, % SiO <sub>2</sub> , % Al <sub>2</sub> O <sub>3</sub> , % K <sub>2</sub> O, % P, % Mn and % S as well as relative density  | % Fe, % SiO <sub>2</sub> , % Al <sub>2</sub> O <sub>3</sub> , % K <sub>2</sub> O, % P, % Mn and % S as well as relative density  |
| Variography updated in current year       | No   | Yes  |
| Search parameters updated in current year | No   | Yes  |
| Solids modelling                          |  |  |
| Solids modelling software                 | GEOVIA Surpac  | GEOVIA Surpac  |
| Input                                     | Updated solids models  | Updated solids models  |
| Method                                    | Digital wireframe modelling for ore segments and some waste segments (waste in contact with ore zones)<br>Digital terrain models for other waste segments  | Digital wireframe modelling for ore segments and some waste segments (waste in contact with ore zones)<br>Digital terrain models for other waste segments  |
| Domaining                                 | Primary lithological domains are subdomained based on structural discontinuities, and distinguishable variation in grade, i.e. K <sub>2</sub> O as well as where volumes have been informed predominantly by core or percussion borehole data, i.e. different data populations | Primary lithological domains are subdomained based on structural discontinuities, and distinguishable variation in grade, i.e. K <sub>2</sub> O as well as where volumes have been informed predominantly by core or percussion borehole data, i.e. different data populations |
| Topography and pit progression assigned   | 31 December 2022 (planned boundary)  | 31 December 2021 (planned boundary)  |
| Validation conducted                      | Yes (for gaps and overlaps by software queries as well as honouring of borehole contacts) and by standard software validation tools (open sides, self-intersecting triangles)  | Yes (for gaps and overlaps by software queries as well as honouring of borehole contacts) and by standard software validation tools (open sides, self-intersecting triangles)  |

## Mineral Resource ancillary information continued

# Ancillary Reserve and Resource information per operation cont.

**Table 13B (continued):** Sishen's 2022 versus 2021 NN1 (A to C) geological models Mineral Resources estimation parameters – as an example (similar tables exist for the NN2 (A to C), NN3 (A to C), NN4 (A to C), MM1 (A to C), SS1 (A to C), SS2 (A to C), SS3 (A to C), LVD (A to C) and DNV (A to C) geological models but are not stated in this report)

| NN1 (A to C) geological models                            | 2022  | 2021  |
|---|---|---|
| <b>Grade estimation methodology</b>                       |   |   |
| Ore segments  | Ordinary (Co-) Kriging  | Ordinary (Co-) Kriging  |
| Waste segments  | Global estimate   | Global estimate   |
| <b>Geological block modelling</b>                         |   |   |
| Block modelling software                                  | Isatis/Surpac   | Isatis/Surpac   |
| Model type  | Centroid model  | Centroid model  |
| Parent cell size  | 20 m(X) x 20 m(Y) x 12.5 m(Z)   | 20 m(X) x 20 m(Y) x 12.5 m(Z)   |
| Minimum sub-block cell size                               | 5 m(X) x 5 m(Y) x 3.125 m(Z)  | 5 m(X) x 5 m(Y) x 3.125 m(Z)  |
| <b>Cell population method</b>                             |   |   |
| Tonnage   | Volume of lithology intersected by cell centroid and constrained by cell limits, multiplied with relative density estimate of the same lithology at same unique cell centroid position in space | Volume of lithology intersected by cell centroid and constrained by cell limits, multiplied with relative density estimate of the same lithology at same unique cell centroid position in space |
| Grade   | Estimate of grade at unique cell centroid position in space applicable to total volume or tonnage constrained by the cell   | Estimate of grade at unique cell centroid position in space applicable to total volume or tonnage constrained by the cell   |
| Updated geological block model ID (file name + extension) | nn1 (a to c).mdl  | nn1 (a to c).mdl  |
| Update completion date                                    | 28 February 2021  | 28 February 2021  |
| <b>Geological confidence classification</b>               |   |   |
| Method summary  | Scorecard/CP over-ride  | Scorecard/CP over-ride  |
| Grade continuity parameters (and associated weighting)    | Fe estimate Slope-of-Regression (33.3%); Sample Representivity Index (33.3%); Actual vs Default Assays (33.3%)  | Fe estimate Slope-of-Regression (33.3%); Sample Representivity Index (33.3%); Actual vs Default Assays (33.3%)  |
| Geometry continuity parameters (and associated weighting) | Distance to Closest Sample (50%); Geological Complex areas (50%)  | Distance to Closest Sample (50%); Geological Complex areas (50%)  |
| – Grade continuity weighting (%)                          | 60  | 60  |
| – Geometry continuity weighting (%)                       | 40  | 40  |
| <b>Confidence index cut-offs within 1 to 9 range</b>      |   |   |
| – Measured  | ≥7  | ≥7  |
| – Indicated   | 5 to <7   | 5 to <7   |
| – Inferred  | 1 to <5   | 1 to <5   |
| CP over-ride  |   |   |
| – Measured to Indicated (Mt)                              | 40.5  | 40.5  |
| – Indicated to Inferred (Mt)                              | None  | None  |
| <b>Estimator</b>  |   |   |
| Resource estimator  | Fanie Nel, Tshele Sekoere, Obed Nkuna, Jacques Deacon   | Fanie Nel, Tshele Sekoere, Obed Nkuna, Jacques Deacon   |
| Resource estimator status                                 | Internal technical specialists  | Internal technical specialists  |
| Estimator employer  | Sishen Iron Ore Company Proprietary Limited   | Sishen Iron Ore Company Proprietary Limited   |

# Endorsement

## The persons that accept overall responsibility (Lead CPs) and accountability (Chief Executive) for the declaration of the 2022 Kumba Ore Reserve and Mineral Resource estimates.

The person designated by the Kumba executive as Lead Competent Person to take responsibility on behalf of Kumba for Mineral Resources is Jean Britz. Mr. Britz has extensively reviewed the Mineral Resource estimates reported for 2022 and considers these to be compliant with the SAMREC Code (the relevant portions of Table 1 of the Code) and the JSE Listings Requirements (section 12.3), and consents to the inclusion of these estimates in the form and context in which they appear in the *Kumba Iron Ore Limited Ore Reserve (and Saleable Product) and Mineral Resource Report 2022*.

Jean Britz is a professional natural scientist, registered (400423/04) with the South African Council for Natural Scientific Professions. He has a BSc (Hons) in Geology and an MEng in Mining and has 30 years of experience as a mining and exploration geologist in coal and iron ore, of which 18 are specific to iron ore Mineral Resource estimation and evaluation.

Jean Britz is a full-time employee of Sishen Iron Ore Company Proprietary Limited, serving as the Principal, Mineral Resources and Geometallurgy – Kumba Iron Ore Geosciences.



**Jean Britz**

Principal, Mineral Resources and Geometallurgy – Kumba Iron Ore Geosciences

The person designated by the Kumba executive as Lead Competent Person to take responsibility on behalf of Kumba for Ore Reserves is Dr Theunis Otto. Dr Otto has extensively reviewed the Ore Reserve estimates reported for 2022 and considers these to be compliant with the SAMREC Code (the relevant portions of Table 1 of the Code) and the JSE Listings Requirements (section 12.13), and consents to the inclusion of these estimates in the form and context in which they appear in the *Kumba Iron Ore Limited Ore Reserve (and Saleable Product) and Mineral Resource Report 2022*.

Dr Theunis Otto is an ECSA-registered Mining Engineer (990072), has a PhD in Mining Engineering and has 27 years of experience as a mining engineer in production management and technical roles in coal and iron ore mining, of which 18 years are specific to iron ore Mineral Reserve estimation and evaluation.

Dr Theunis Otto is a full-time employee of Sishen Iron Ore Company Proprietary Limited, serving as the Manager: Mining.



**Theunis Otto**

Manager, Kumba Iron Ore Mining

Kumba's Head of the Technical and Projects department, serving as an Executive Committee member for the Company, Mr Glen Mc Gavigan, endorses the Mineral Resource and Ore Reserve estimates presented in this report, and acknowledges that the Kumba Iron Ore policy which governs Mineral Resource and Ore Reserve reporting has been adhered to.



**Glen Mc Gavigan**

Head –Technical and Projects, Kumba Iron Ore

# Glossary of terms and acronyms

|                  |   |
|------------------|---|
| AA plc           | Anglo American plc  |
| BIF              | Banded iron formation   |
| CP               | Competent Person  |
| DMRE             | Department of Mineral Resources and Energy  |
| DMS              | Dense media separation  |
| DSO              | Direct shipping ore   |
| ECSA             | Engineering Council of South Africa   |
| EMPr             | Environmental management programme  |
| ESG              | Environmental, social and governance'   |
| Fe               | Iron  |
| FOB              | Free-on-board   |
| Ga               | Giga-annum  |
| JSE              | Johannesburg Stock Exchange   |
| JV               | Joint venture   |
| KIO              | Kumba Iron Ore  |
| Kumba            | Kumba Iron Ore  |
| LNG              | Liquefied natural gas   |
| LoA              | Life-of-asset   |
| LoAP             | Life-of-asset plan (replacing the term life-of-mine plan as used in 2021)   |
| LT               | Long term   |
| MOP              | Monthly operational plan  |
| MPRDA            | Mineral and Petroleum Resources Development Act No 28 of 2002   |
| Mt               | Million tonnes  |
| Mtpa             | Million tonnes per annum  |
| NPV              | Net present value   |
| ORMR             | Ore Reserve (and Saleable Product) and Mineral Resource report  |
| QA/QC            | Quality assurance and quality control   |
| R&R              | Reserve and Resource  |
| RC               | Reverse circulation drilling  |
| RPEEE            | Reasonable prospects for eventual economic extraction   |
| SACNASP          | South African Council for Natural Scientific Professions  |
| SAMESG Guideline | South African guideline for the reporting of environmental, social and governance parameters                          |
| SAMREC Code      | The South African Code for the Reporting of Exploration Results, Mineral Resource and Mineral Reserves – 2016 Edition |
| SANAS            | South African National Accreditation System   |
| SIOC             | Sishen Iron Ore Company Proprietary Limited   |
| SMU              | Selective mining unit   |
| TS of AA plc     | Technical Solutions Division of AA plc  |
| UHDMS            | Ultra-high density media separation   |





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