exxaro

POWERING POSSIBILITY

Exxaro Resources Limited
Consolidated Mineral Resources
and Mineral Reserves report 2021

Foreword

Exxaro continuously strives to enhance the level of estimation and reporting of Mineral Resources and Mineral Reserves. The group is committed to the principles of transparency, materiality and competency in reporting its Mineral Resources and Mineral Reserves.

The information in this report is aligned with the JSE Listings Requirements (section 12:13) and encapsulates information on reporting governance, competence, tenure, risk, liabilities and assurance as well as auxiliary descriptions of applicable projects, operations and exploration activities.

Mineral Resources and Mineral Reserves were estimated by Competent Persons on an operational or project basis and in line with the South African Code for Reporting of Exploration Results, Mineral Resources and Mineral Reserves, 2016 edition (SAMREC Code) for African properties (coal) with the exception of the Vedanta Resources base metal property, and the Australasian Code for Reporting of Exploration Results, Mineral Resources and Mineral Reserves, 2012 edition (JORC Code) for Australian (coal) and the Vedanta Resources property.

For Coal Resources and Coal Reserves under Exxaro management's control, estimation is in line with the South African National Standard: South African guide to the systematic evaluation of Coal Resources and Coal Reserves (SANS 10320:2020 edition 2). Mineral Resource and Mineral Reserve estimates are quoted in full, irrespective of Exxaro's shareholding. The report primarily encapsulates all aspects relating to Exxaro's coal estimation and reporting. We therefore predominantly use the terminology Coal Resources and Coal Reserves throughout the report. We also use the terminology Mineral Resources and Mineral Reserves where we collectively refer to coal and base metal estimates.

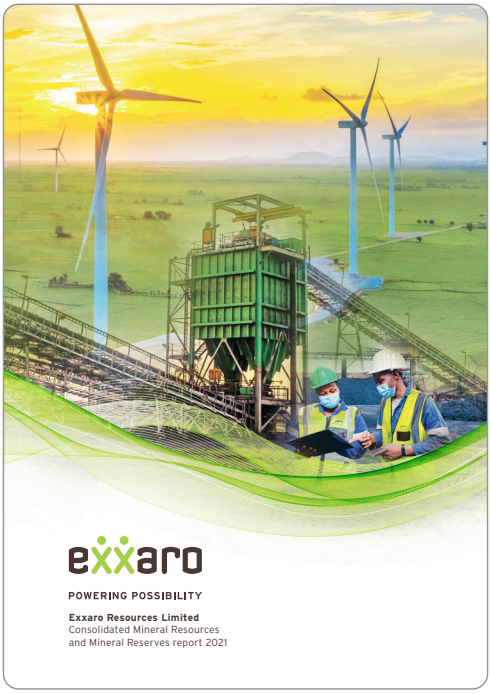
Exxaro reports Mineral Resource and Mineral Reserve estimates directly under its management's control and includes estimates for entities in which we hold a 25% interest or more. Supplementary descriptions are provided for projects and operations directly under our management control. For projects and operations mentioned in the report but in which Exxaro does not have management control, please refer to the relevant company's website, shown below, for supplementary information. This approach ensures maximum compliance with the principles of materiality and transparency.

Anglo American Coal operations and projects:
www.angloamerican.com/investors/annual-reporting

Thungela: https://www.thungela.com/

Kumba Iron Ore: www.angloamericankumba.com/investors

Vedanta Resources base metal operations and projects:
www.vedantaresources.com/investor-relations/



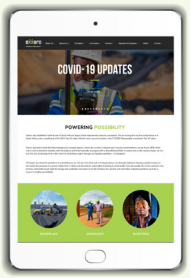
NAVIGATING THIS REPORT

We use icons to show:

Detailed disclosure and further reading

Read more online at
www.exxaro.com

Read more within
this report



FEEDBACK

We encourage and welcome feedback from our stakeholders. Please send any comments or suggestions to:

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Tel: +27 12 307 3174
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www.exxaro.com

Disclaimer: Photographs of people without masks were either taken pre-COVID-19 or in full compliance with health and safety protocols. With thanks to Stefanie De Beer, Line of Sight Photography, for Cennergi's windfarm photographs used in our integrated and ESG reports.

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Certification by group company secretary

In terms of section 88(2)(e) of the Companies Act, 2008 (Act 71 of 2008), as amended (Companies Act), I, Andiswa Ndoni, in my capacity as group company secretary, confirm that, to the best of my knowledge, for the year ended 31 December 2021, Exxaro Resources Limited (Exxaro) has filed with the Companies and Intellectual Property Commission all such returns and notices as required of a public company in terms of the Companies Act, and that all such returns and notices appear to be true, correct and up to date.

The directors do not know of any legal impediments or other material conditions that may have an influence on the rights to explore or mine.

Andiswa Ndoni
Group company secretary
Pretoria

4 April 2022

Certification by competent persons

The Exxaro lead Competent Persons are appointed by the Exxaro executive management team.

The Exxaro lead Coal Resource Competent Person is Henk Lingenfelder, a member of the Geological Society of South Africa (GSSA) and professionally registered with the South African Council for Natural Scientific Professions (SACNASP). He has a BSc (Hons) in geology and 26 years of experience as a geologist in coal, iron ore and industrial minerals.

The person in Exxaro designated to take corporate responsibility for Coal Resources, Henk Lingenfelder, the undersigned, has reviewed and endorsed the reported estimates.

Henk Lingenfelder
BSc (geology) (Hons)
PrSciNat (400038/11)
Group manager: geosciences

263 West Avenue, Die Hoewes
Centurion 0163
South Africa

South African Council for Natural Scientific Professions
Private Bag X540
Silverton 0127
South Africa

The Exxaro lead Coal Reserve Competent Person is Chris Ballot, a mining engineer registered with the Engineering Council of South Africa (ECSA). He has 25 years of experience in iron ore, mineral sands and coal in various technical and management roles. His qualifications include BEng (mining), GDE and MBA.

The person in Exxaro designated to take corporate responsibility for Coal Reserves, Chris Ballot, the undersigned, has reviewed and endorsed the reported estimates.

Chris Ballot
BEng (mining)
ECSA 20060040
Group manager: mining

263 West Avenue, Die Hoewes
Centurion 0163
South Africa

Engineering Council of South Africa
Private Bag X691
Bruma 2026
South Africa

Both parties are in the full-time employment of Exxaro, Henk Lingenfelder as the group manager: geosciences and Chris Ballot as the group manager: mining. Both parties have consented to the inclusion of Resources and Reserves estimates in the 2021 integrated report. Exxaro has written confirmation from the Competent Persons (Table 2) that the reporting is compliant with the SAMREC Code, the relevant portions of Table 1 and the JSE Listings Requirements (section 12:13), and they consent to the publication of the report in the form and context in which it was intended.

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Performance at a glance

Exxaro continuously strives to enhance the estimation and reporting of our Resources and Reserves. Our estimation and reporting strategy focuses on sustaining our mineral asset base by employing responsible and innovative technical management. Value extracted from the mineral assets is continuously reviewed with mine planning, considering evolving knowledge of the mineral asset's geological complexities and its opportunities.

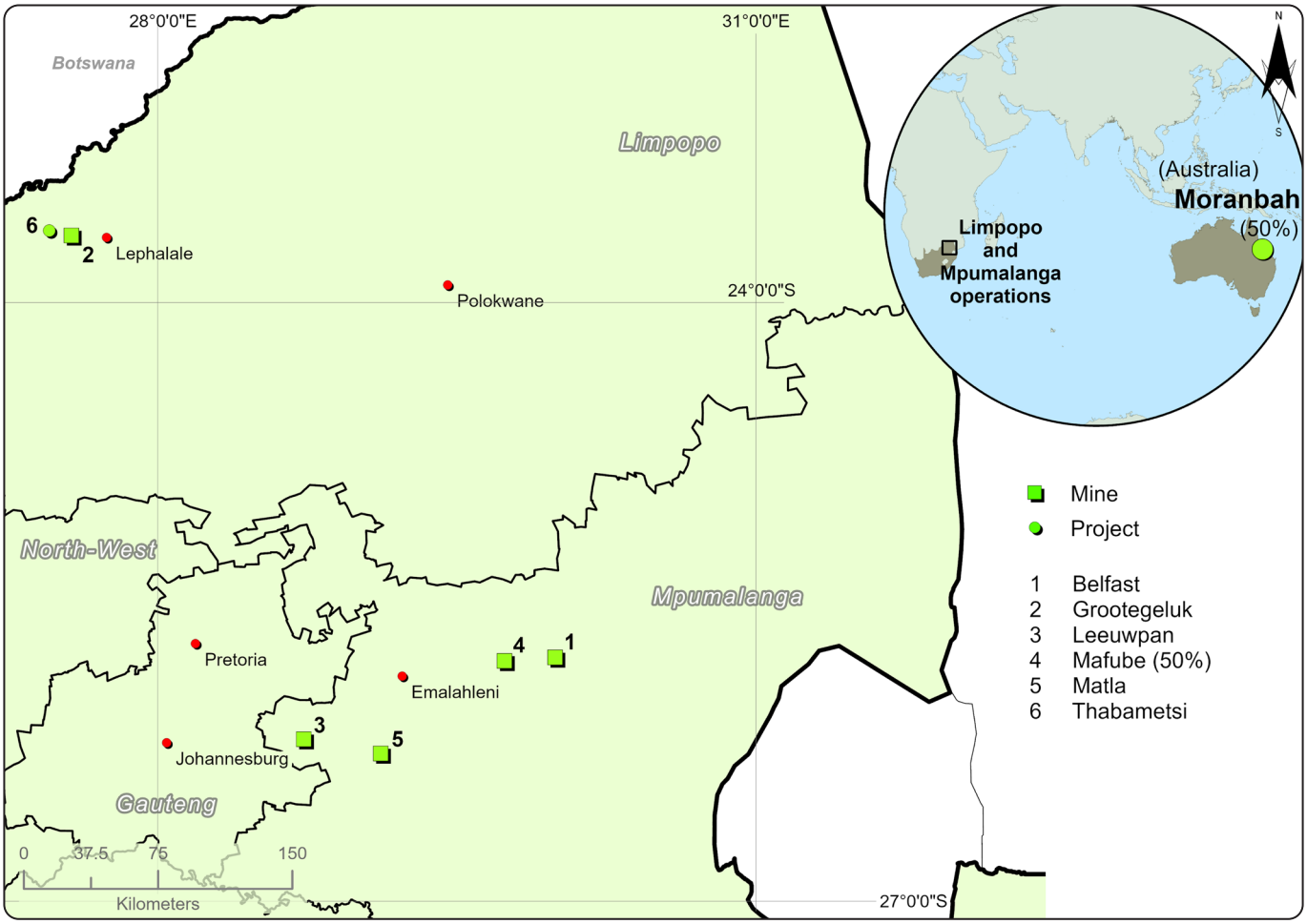
ACHIEVEMENTS

- Alignment in estimation and reporting methodology with SANS 10320:2020 edition 2
- Update of geological models at Mafube and Leeuwpan and the review of life of mine (LoM) at Belfast and Matla
- Implementation of opencast coal solution (OCCS) and underground coal solution (UGCS) mine planning software
- Continuous investigation of migrating to a sample model at Grootegeluk mine in support of the OCCS software implementation
- Successful execution of exploration plans at our coal operations despite COVID-19 regulations

SALIENT FEATURES

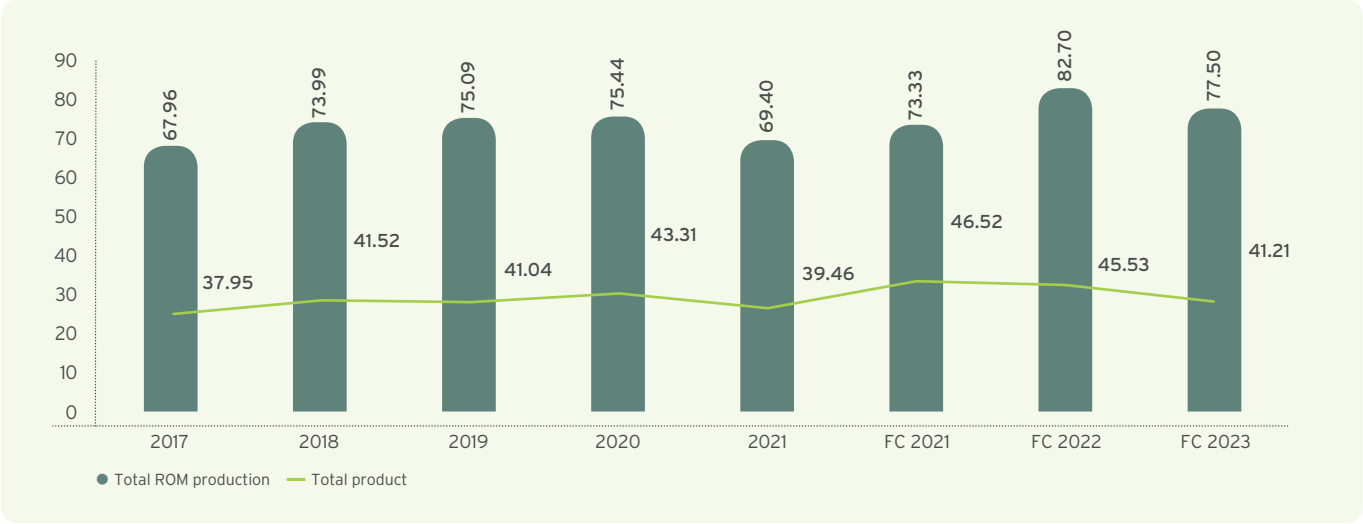
- Reduction in carbon footprint
- Record production at Grootegeluk
- Divestment conclusion of Exxaro Coal Central (ECC)
- Successful roll-out of the early coal value strategy

Figure 1: Locations of our coal operations and projects



Performance at a glance continued

Figure 2: Exxaro's performance (Million tonnes)



Strategy and overview of estimates

Exxaro has a world-class Coal Resource portfolio, comprising fully owned operations and projects, and a number of jointly owned operations and projects in South Africa and Australia. The fully owned operations and projects in South Africa are located in the large and highly prospective Waterberg coalfield in Limpopo, and the more mature Highveld and Witbank coalfields in Mpumalanga.

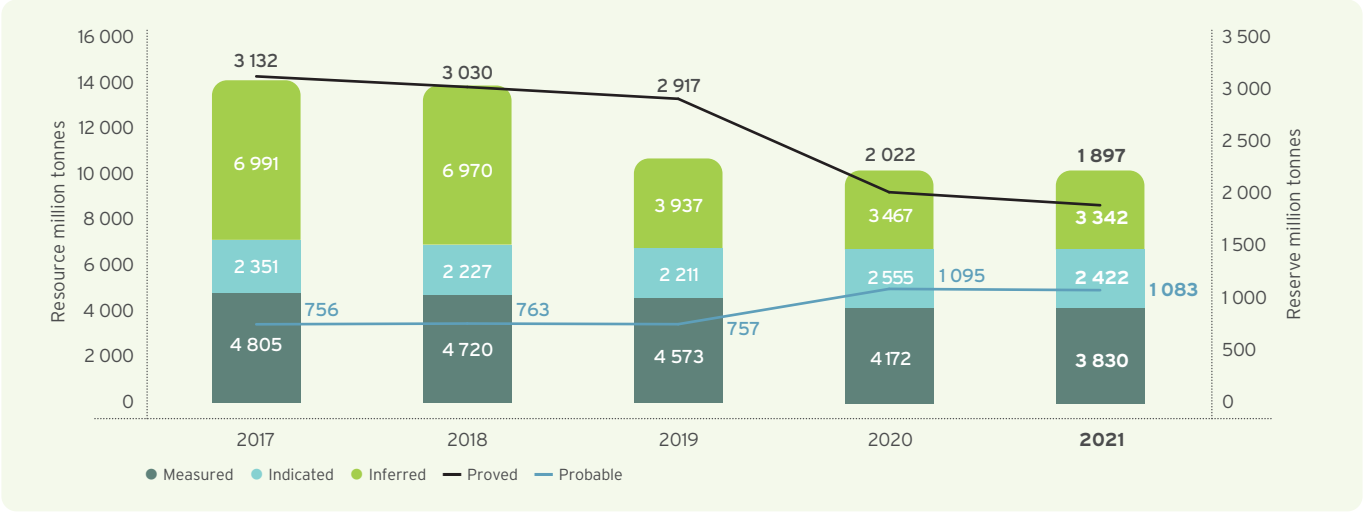
Our **Coal Resource and Coal Reserve estimation strategy** focuses on providing integrity and trust to our mineral estimates by employing responsible and innovative technical management principles. Our Competent Persons are the custodians of the mineral assets, and are therefore accountable for ensuring the integrity of our Resource and Reserve estimates by applying pioneering technology in combination with trusted knowledge and experience. Our projects, operations and expansion initiatives are built on these trusted and assured Coal Resources and Coal Reserves, creating a platform for the LoM from which annual business plans are derived. The Mineral Resource managers of each operation are the custodians of the LoM and ensure professional execution of the business plans, stimulating profitability and return on investment while guarding against irresponsible exploitation.

Our **Sustainable Growth and Impact strategy** is designed to participate in the just transition to a low-carbon economy while delivering on our early value coal strategy in a prudent and responsible manner. There has been a steady decrease in our total attributable Coal Resources with Exxaro divesting from the large Waterberg North-and-South prospecting assets in 2019 and ECC* in 2020. We are currently in the process of divesting from the Leeuwpan coal mine near the town of Delmas and investigating future options for the Thabametsi mining right, a large Coal Resource adjacent to our Grootegeluk coal mine, after the cancellation of the associated independent power producer (IPP) project.

In 2020, we outlined our strategy to access **early value** at our coal operations. Mining has, during 2021, successfully advanced within the newly implemented mining plans at our Grootegeluk and Belfast operations. The execution of our 2021 exploration programmes in support of this early value mine plans was not as severely impacted by the COVID-19 pandemic as in the previous reporting year due to proactive planning by the operational teams. We could therefore conclude our exploration plans at all our coal operations in support of our early value exploitation plans.

We continuously strive to enhance the level of estimation and reporting of Resources and Reserves, committed to our **governance structures** and **associated assurance processes**. In 2021, we conducted internal reviews during the update of the geological and structural models at our Leeuwpan and Mafube operations. Our geological models were scrutinised by a review team consisting of geoscience, geotechnical, structural and mining specialists before sign-off and handover to mine planning was concluded. Reviews of LoM were conducted at the Belfast and Matla operations. We also conducted a number of technical reviews of development projects with specific focus on the estimation that underpins these projects. The Grootegeluk integrated water management and truck and shovel strategies, the Belfast contracting options and Mafube debottleneck projects are examples of reviews undertaken with technical findings and opportunities documented and included in the various project development processes. In addition, EY conducted an external estimation process audit at the Leeuwpan operation. No critical findings, which may have a material impact on our estimates, were reported. Four findings regarding the improvement within our process relating to the timely update of estimation procedures and Reserve fact packs were noted. Corrective measures were implemented and audited, and findings were closed. A number of proposals to unlock value within the geological modelling process were received and we welcome these valuable inputs to enhance our current methodologies.

Figure 3: Exxaro's attributable Coal Resources and Coal Reserves



** Divestment concluded in September 2021.*

Strategy and overview of estimates continued

Our total **attributable Coal Resource** decreased by 6%, primarily the result of mining depletion at our operations, the divestment from ECC and a change at Matla coal mine due to the movement of 111Mt of Coal Resources outside the LoM to inventory. These Coal Resources are remnant and isolated coal blocks due to locality, infrastructure and/or accessibility constraints and do comply with our considerations of Realistic Prospects of Eventual Economic Extraction (RPEEE) for reporting of Coal Resources.

Our total **attributable Coal Reserve** decreased by 4%, mainly due to the divestment of ECC and normal mining depletion at the various operations.

The **divestment of ECC** decreased the total attributable Resources by 556Mt and the total Reserves by 95Mt. The change is, however, masked by the significant amount of Coal Resources and Reserves held within our Waterberg coal assets.

For **all other operations**, other than normal LoM depletion, no material changes to the total attributable Coal Resource and Reserve estimates are reported. We do not know of any pertinent technical and operational risks or other material conditions that may impact the company's ability to mine or explore.

Exploitation at our **Grootegeluk coal mine**, of the thick interbedded coal deposit (Volksrust Formation) in conjunction with the underlying multi-seam coal deposit (Vryheid Formation) through a large open pit, producing various specialised coal products via a significant beneficiation complex, requires a well-planned, well-balanced and integrated geoscientific, mining and beneficiation (MRM) process. We have therefore, during the reporting year, pursued various initiatives within this value chain.

Our geological model consists of 11 coal zones (benches) with each bench incorporating various individual coal and shale samples. In 2021, the team compiled a comprehensive coal and shale sample model to provide additional detail and flexibility to mine planning to enhance the quality of run of mine (RoM) coal streams to the various beneficiation plants. We have, in parallel, started with the implementation and testing of our OCCS mine planning software for improved development of mine layouts and schedules. We envisage that the sample model, aligned with the OCCS-based mine planning solution, will unlock considerable value for the Mineral Resource Management (MRM) process.

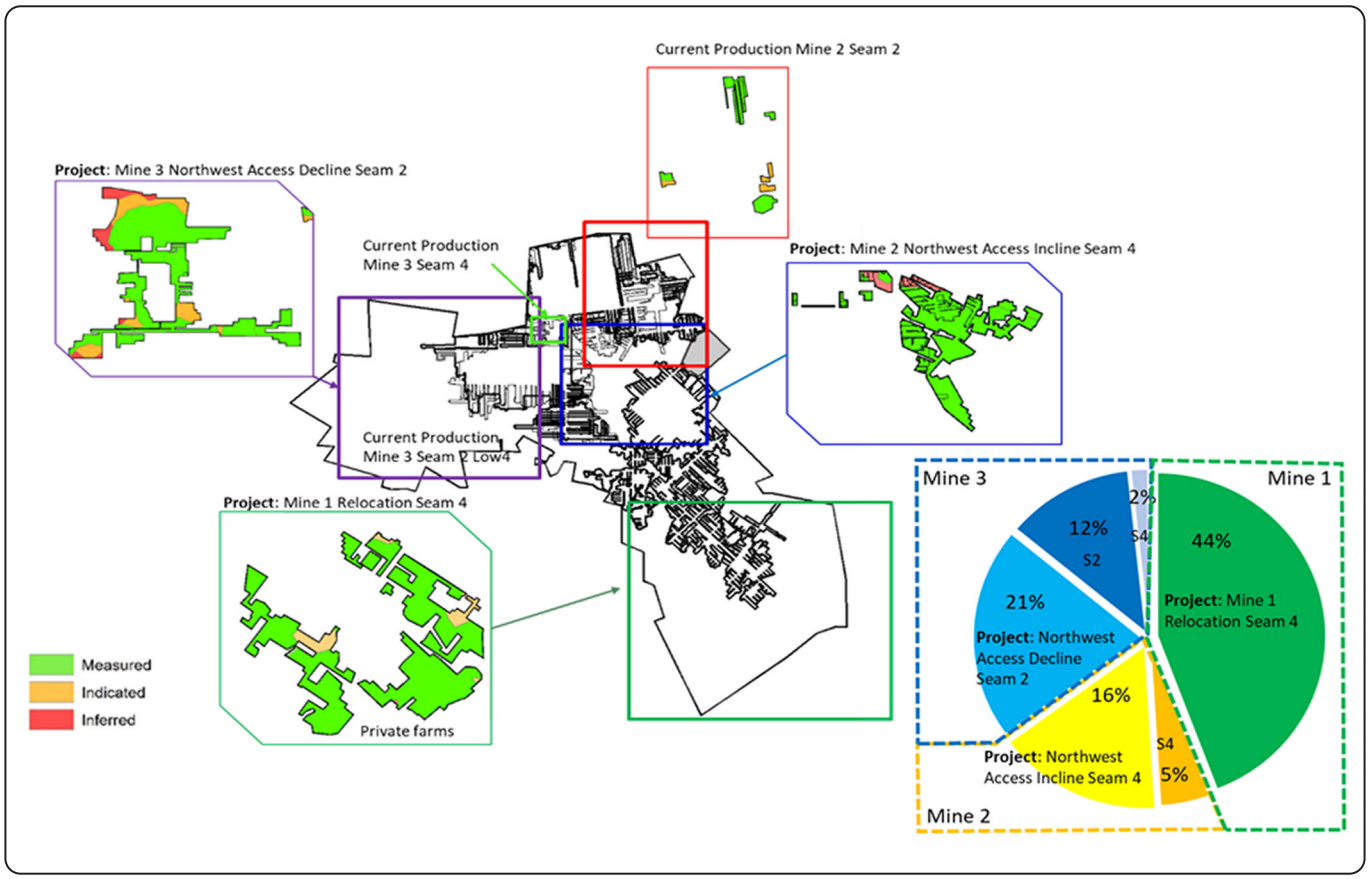
A number of studies associated with the LoM are in progress at our Grootegeluk coal mine. Water as well as overburden (OVB) management are significant aspects of our huge opencast coal operation. An integrated water management system project, with the objective to improve overall water management at the mine, ensuring legislative compliance and sustainable production over LoM, is nearing conclusion. We believe that the outcomes will enhance efficiency of water management and water use. The Grootegeluk Alternative Mining Solution (GGAMS) project that investigates different methods of extracting, transporting, handling and placement of OVB is also near completion with outcomes expected during the second quarter of 2022. The execution of the early value mine plan previously mentioned is progressing well with planning and development in place for opening of the northern turnaround pit in 2030. Planning of a backfill and a discard system to accommodate the increase in waste and relocation of in-pit crushers are in progress. We foresee that the north pit will be fully established in 2036 on all benches. At that point in time, OVB will be mined in an easterly direction while backfill and discard will be advancing in a westerly direction in the central pit. OVB mining will commence in the southern pit around 2046.

We successfully addressed a number of challenges at our **Belfast coal mine** through the implementation of technical solutions and effective management of the market-to-resource exploitation process. With results from detailed geological and metallurgical investigations we successfully facilitated impacts relating to coal weathering and near-density coal material that affected our plant yield. Mining continued from pits 1, 2 and 7 as well as the newly introduced pit 4B on the western side of the Coal Reserve totalling RoM of 2.80Mt. The additional pit space introduced more flexibility and mitigated excess water challenges in pit 7 experienced during the wet season. The collection of mining actuals since the start of operations resulted in accurate coal and waste reconciliation, and enhanced our reserve estimation modifying factors.

We completed a market-to-resource investigation leading to the successful transitioning from RB1 to RB2 product specification with subsequent increase in yield. This investigation is, however, ongoing where we continuously strive to establish the optimal product mix for the asset and Exxaro. The annual RoM target, based on lower Transnet Freight Rail (TFR) performance and approved lower train allocation to Belfast resulted in a slight increase from 11 to 12 LoM years. The Coal Reserves at Belfast mine only fall within the southern portion of the total Coal Resource with ~80Mt of the Resource located to the north and outside the LoM. The Belfast Expansion Project (BEP), a prefeasibility study to potentially expand the LoM to the north, is progressing well with exploration drilling concluded in 2021. Drilling results will upgrade most of the BEP Coal Resources to the Measured Resource category and further studies will commence in early 2022 to optimise characterisation and test optimal exploitation options.

Matla mine has three valuable mine expansion projects in various stages of implementation. Together these development projects contain an estimated 83% of Matla's Coal Reserve, illustrating their significance in the future of the operation. Timely funding and subsequent project execution are vital. Some delays have placed the operation under pressure to identify additional ground for the various mining teams until delays are addressed, which they achieved.

Figure 4: Matla's expansion projects



How we report

GOVERNANCE

The Exxaro annual estimation and reporting process is managed through Exxaro geosciences as well as LoM policies and associated Coal Resource and Coal Reserve reporting and estimation procedures. These policies and procedures are aligned with the guidelines of the JSE Listings Requirements (section 12:13) and the SAMREC Code 2016.

The policies and procedures dictate technical requirements for estimation and reporting, and include guidelines on methodologies, processes and deliverables. Procedures are also implemented for the geophysical, rock engineering, geotechnical, structural geology, hydrogeological, exploration and mine planning disciplines that prescribe methodologies and minimum standards for compliance.

Table 1: Exxaro's reporting structure

REGULATORY	GOVERNANCE	DELIVERABLES	ASSURANCE
JSE Listings Requirements (section 12)	**Geosciences policy**	**Annual Resource and Reserve estimation schedule**	**Annual review and update of procedures**
Considered 2016 amendments to minimum contents of annual report, point 12.13	Reviewed in 2021 and update to follow in second quarter of 2022 to align with new minerals strategy	Followed 2021 estimation schedule for operations under Exxaro's control	Considered 2021 updated procedures
SAMREC Code (Table 1)	**Exxaro's Mineral Resource and Mineral Reserve reporting procedure**	**Mineral Reserve fact packs**	**Competent Persons' register update and review**
Considered 2016 updated Table 1	Considered 2021 update	2021 Mineral Reserve fact packs updates for Matla and Belfast	Updated for 2021
SANS 10320:2020 edition 2	**Exxaro's Mineral Resource estimation procedure**	**Annual Mineral Resource and Mineral Reserve Competent Persons report**	**Exxaro Consolidated Mineral Resource and Mineral Reserve report (CMRR) review and lead Competent Person sign-off**
Transitioned to align with proposal and methodologies of SANS 10320:2020 edition 2	Considered 2021 update	Competent Persons' reports updated for Matla and Leeuwpan	Externally peer reviewed by Sugarbush Consulting and signed off by lead CP's
JORC Code	**Exxaro's Mineral Reserve estimation (LoM) procedure**	**Mineral Resource and Mineral Reserve report**	**Applicable Competent Person and technical team sign-off**
Considered JORC Code, 2012 Edition	Considered 2021 update	Reports updated for Grootegeluk, Mafube and Belfast	Included in individual Competent Persons' and annual Resource and Reserve reports, available on request
			Internal review and external audit process
			Conducted several internal and external audits during reporting period and noted findings (subsequently addressed) discussed in section 5 (Assurance)

COMPETENT PERSONS

Exxaro applies three levels of "competency" to estimating Coal Resources and Coal Reserves:

- **Competent Person** (as defined in the SAMREC and JORC codes) who officially takes responsibility for estimating and reporting Coal Resources and/or Coal Reserves at operational or project level. These Competent Persons have been appointed and acknowledged acceptance of accountabilities. Names, qualifications, affiliations and relevant experience are included in the independent operational and project reports in the form of a Competent Persons' certificate.
- **Technical specialists** could include geologists, mining engineers, geohydrologists, geotechnical engineers, financial experts and economists, among others. Technical specialists who contributed to estimating the operation's Coal Resources and Coal Reserves are included in the original Competent Persons' report documentation, with their contributions specified, as well as their names and signatures.
- Person(s) designated to take **corporate responsibility** for the Coal Resource and Coal Reserve estimates presented in the consolidated report are clearly differentiated from the Competent Person at an operational level who takes overall corporate responsibility.

Exxaro's Coal Resources and Coal Reserves have been estimated or supervised by the Competent Persons listed in Table 2 (name, affiliation and relevant experience) on an operational basis in accordance with the SAMREC Code for South African properties and the JORC Code for Australian properties. All Competent Persons have sufficient relevant experience in the style of mineralisation, type of deposit and/or mining method(s) under consideration and/or being mined, and for the activity under their responsibility to qualify as "Competent Persons", as defined in the applicable codes at the time of reporting.

The appointed Competent Persons have signed off their respective estimates in their original Competent Persons' report for the various operations, and consent to the inclusion of the information in this report in the form and context in which it appears in the Consolidated Mineral Resources and Mineral Reserves (CMRR) report. The various appointed Competent Persons are either full-time employees at the operation, namely the resident geologist or mineral resource manager or, in the case of projects, the Competent Persons have conducted appropriate site visits to the mineral property being evaluated. All operations under Exxaro's control have been visited by the applicable Competent Persons.

Exxaro's **lead Competent Persons** are appointed by the management team.

How we report continued

Table 2: Exxaro's 2021 Competent Persons' register

	MINERAL RESOURCES				MINERAL RESERVES			
Operation/project	**Name**	**Relevant experience (years)**	**Job title**	**Registration**	**Name**	**Relevant experience (years)**	**Job title**	**Registration**
Lead Competent Person, Exxaro	JH Lingenfelder	26	Group manager: geosciences	SACNASP (400038/11)	C Ballot	25	Group manager: mining	ECSA (20060040)
Belfast mine	G Gcayi	14	Resident geologist, Belfast	SACNASP (400299/11)	Al Dednam	10	Manager: MRM and optimisation, Belfast	Southern African Institute of Mining and Metallurgy (710051)
Grootegeluk mine	S Mhlongo	10	Resident geologist, Grootegeluk	SACNASP (400044/18)	R Teffo	13	Manager: mining, Grootegeluk	ECSA (2021800057)
Leeuwpan mine	JK Kgarume	8	Resident geologist, Leeuwpan	SACNASP (117081/17)	M Sethethi	15	Mine manager, Leeuwpan	ECSA (20095030)
Matla mine	M Dimmick-Touw	8	Resident geologist, Matla	SACNASP (400134/16)	TF Moabi	16	MRM manager, Matla	SACNASP (400067/08)
Thabametsi project	S Mhlongo	10	Resident geologist, Grootegeluk	SACNASP (400044/18)	C Ballot	25	Group manager: mining	ECSA (20060040)
Mafube (Nooitgedacht and Wildfontein)	D Xaba	22	Geology manager, Anglo American Coal	SACNASP (400115/01)	D Xaba	22	Geology manager, Anglo American Coal	SACNASP (400115/01)
Moranbah South, Australia	AJ Laws	26	Specialist resource geologist, Anglo American Coal	AusIMM (209913)	N/A			
Black Mountain Mining (BMM) Deeps mine, Swartberg and Big Syncline projects	M Campodonic	21	Director and corporate consultant: resource geology, SRK Consulting (UK)	AusIMM (Competent Person: Geology), Fellow of the Geological Society of London (FGS)	J Miles	32	Associate principal consultant: mining engineering, SRK Consulting (UK)	Member of the Institute of Materials Minerals and Mining (MIMMM) (CEng)
Gamsberg	M Campodonic	21	Director and corporate consultant: resource geology, SRK Consulting (UK)	AusIMM (Competent Person: Geology), FGS	J Miles	32	Associate principal consultant: mining engineering, SRK Consulting (UK)	MIMMM (CEng)

** All Competent Persons are Exxaro employees except where otherwise stated and Competent Person qualifications are included in the individual Competent Persons' reports.*
** Exxaro: 263 West Avenue, Die Hoewes, Centurion 0163, South Africa.*
** South African Council for Natural Scientific Professions: Private Bag X540, Silverton 0127, South Africa.*
** Engineering Council of South Africa: Private Bag X691, Bruma 2026, South Africa.*
** Australasian Institute of Mining and Metallurgy (AusIMM): 204 Lygon Street, Carlton VIC 3053, Australia.*

RESOURCE ESTIMATION METHODOLOGY SUMMARY

The estimation process is summarised below and applies to all coal operations and projects under Exxaro's management control. The Resource Competent Person is actively involved throughout the process and no data is included/excluded without consent.

The Resource estimation process for Coal Resources under Exxaro's control is governed by the group's Resource estimation procedure and aligned to the SAMREC Code and SANS 10320:2020 edition 2 standard. The data used for Resource estimation is managed by separate commodity-specific procedures through which core recovery and logging, sampling, quality assurance and control, relative density determination and wireline logging standards are enforced. These standards were updated in 2021 to comply with the SAMREC Code and SANS 10320:2020 edition 2.

Table 3: Summary of estimation considerations

ITEM	DESCRIPTION
Resource fact pack	Lists new information since last estimation together with a reconciliation between predicted mineable tonnage in-situ (MTIS), actual RoM and dates of internal/external audits.
Exploration	Annually compiled, integrated and signed-off exploration plans outline planned activities to investigate areas of low confidence and/or geological or structural complexities to ensure Resources with a high level of geological confidence are considered for mine planning. Exploration plans are available as supplementary information to the Competent Persons' report.
Drilling, logging and sampling process	The senior geologist supervises all drill hole drilling and is responsible for logging and sampling in compliance with Exxaro's logging and sampling standards as well as standard operating procedures. Sampling of drill holes is only conducted after the stratigraphy has been correlated.
Core recovery	The core recovery standard (>95% in coal seams for valid points of observation), as stipulated in the SAMREC Code and SANS 10320 standard, is not always empirically enforced due to unavailability of digital core recovery data for pre-2017 drill holes. However, Exxaro's Competent Persons confirm that there is high confidence in core and sample recovery for all drill holes used for Resource estimation purposes, and any deviation is managed by increased geological losses within geological loss domains, downgrading Resource classification and/or redrilling drill holes. Core recovery is continuously reviewed and any shortcomings are actively addressed through downhole geophysical surveys, seam validations and redrilling.
Relative density determination	For Coal Resources, relative density (air-dried) is determined by accredited laboratories using the Archimedes method in all instances, except for Grootegeluk mine and the Thabametsi project where relative density is determined using an on-site mine laboratory application of the Archimedes method, and results are continuously used to validate core recovery. A comparative study between the field and laboratory methods was undertaken in 2015 and results indicated no significant difference.
Technical data validation	Technical validation of data to be used for Resource estimation including collar validation, gaps and overlaps checks and data distribution.
Data analysis	Entails a review and analysis of the geological integrity and continuity of data in a spatial and geostatistical sense with domaining and structural interpretations.
Data modelling	Geovia MinexTM is used for coal modelling and the MinexTM growth algorithm is the preferred interpolation technique with Esri's ArcGIS used for modelling structural features. acQuire or MinexTM is used for coal compositing and, in both instances, representative substitute values are used for unsampled non-coal material. The geological model and structural interpretation are presented by the Resource Competent Person, aided by relevant technical specialists, to a panel comprising Exxaro's lead Competent Person and domain experts for sign-off and approval. Concept-level geological models, where applicable, are compiled for alternative interpretations and these risks are evaluated during sign-off. Feasibility level and/or LoM plan (LoMP)-level geological models are based on reviewed and signed-off interpretations.

How we report continued

Table 3: Summary of estimation considerations continued

ITEM	DESCRIPTION
Resource classification	Resource classification follows the Exxaro estimation procedure and is aligned with SANS 10320:2020 edition 2 and considers risk and opportunity domain analysis (RODA). Anomalous drill hole data and structurally complex areas are accounted for and Resource classification is used to control the adequacy of drill hole data. Separate confidence zones are determined for structural features, based on a matrix approach. The effect of extrapolation is controlled by Resource classification in which classification domains are not extrapolated beyond half the average drill hole spacing for the classification category. Only points of observation with applicable quality data are used for classification.
Estimation and reporting	Resource reporting uses approved cut-offs and geological loss domains, followed by completion of all necessary reports and audit trails. Exxaro currently uses a systematic and integrated review process that measures the level of maturity of exploration work done, the extent of geological potential, licence to operate and associated geological risks to establish the eventual extraction. The criteria for assessing reasonable prospects for eventual economic extraction (RPEEE) are shown in Table 4. Reporting includes technical information that requires subsequent calculations to derive subtotals, totals and weighted averages. Such calculations may involve a degree of rounding and consequently introduce an error. Where such errors occur, Exxaro does not consider them material.
Review and consolidation	Individual reports are reviewed and corrections are effected if necessary. Reports are endorsed by management and used to compile the consolidated Coal Resources and Coal Reserves report.

REALISTIC PROSPECTS OF EVENTUAL ECONOMIC EXTRACTION (RPEEE) CONSIDERATION

RPEEE should be demonstrated through the application of an appropriate consideration of Mineral Resources. Such a consideration should include a reasoned assessment of the geological, mining engineering, processing, metallurgical, legal, infrastructural, environmental, marketing, socio-political and economic assumptions which, in the opinion of the Competent Person, are likely to influence the prospect of economic extraction. All of the issues listed under "reasonable prospects for eventual economic extraction" should be discussed at the level appropriate for the specific investigation. – SAMREC Code

Table 4: Exxaro's considerations for RPEEE

ITEM	CRITERIA	CONSIDERATIONS
Geological data	Data validated and signed off by Competent Person	Seam depth, extent, thickness, geological structure and seam quality (cut-off)
Geological model	Geological model considered and signed off	
Structural model	Structural model considered and signed off	
Mining	Mining assumptions considered and defined	Mining method, inputs from metallurgist, rock engineer and hydrogeologist
Assurance	Minimum tier 1 assurance as per Exxaro governance and assurance framework	As per tier 1 requirement
Economic evaluation	Concept-level exploitation and economic evaluation quantifies economic potential based on economic and mining assumptions including geotechnical and geohydrological assumptions	Preliminary appraisal of layout, cost and profit
Environmental	Assessment of potential impediments and, if any exist, a reasonable expectation of resolution with reasonable demonstration that environmental approvals can be obtained within the context of local, regional and national legislation	
Tenure	Formal tenure must be demonstrated and, if any potential impediments exist, there must be reasonable expectation of resolution or, if a prospecting right, there should be reasonable demonstration that a mining right approval can be obtained within the context of local, regional and national legislation	
Infrastructure	Assumptions used should be reasonable and within known/assumed tolerances or have examples of precedence and any potential impediments should have a reasonable expectation of resolution, considering power, water and transport	
Market	Potential market for product that is planned to be extracted from the Resource with a reasonable assumption that this market is sustainable	

RESERVE ESTIMATION METHODOLOGY SUMMARY

Exxaro is keenly aware of the importance of its mineral assets for the short-term profitability of its operations and the sustainability of the company. The optimisation of mineral assets beyond what is generally referred to as Mineral Resource management is being driven as a priority.

Changes in the resources market, increased awareness of protecting the natural environment and changing legislation and statutory requirements demand a change in the utilisation strategy and execution of mining operations. Exxaro continuously assesses the various LoM strategic plans to consider the best way to address these challenges.

Figure 5: SAMREC figure

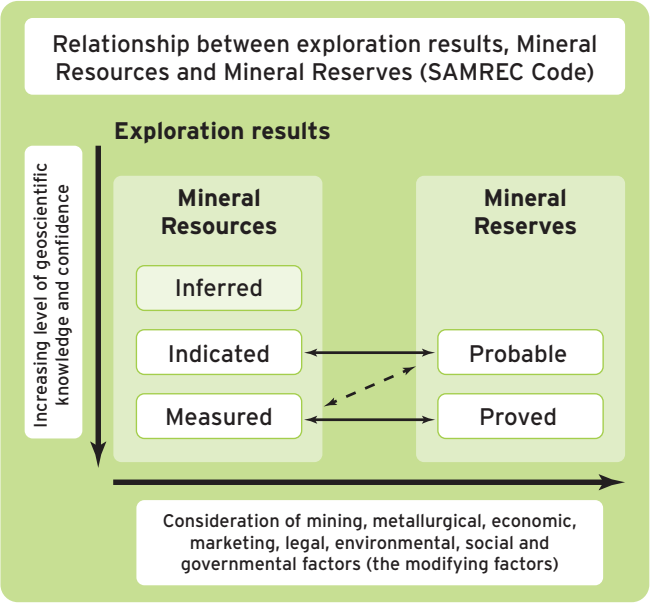


Table 5: Summary of reserving process

ITEM	DESCRIPTION
Inputs	For Coal Reserve estimates to comply with LoM policy, survey, rock engineering, infrastructure, legal, processing, social, economic, political and environmental inputs are required for all Reserve estimates as well as a Reserve estimation scoping report.
Reserve fact pack report	At the start of the estimation process, the applicable Reserve Competent Person must compile, for every operation, a Reserve fact pack report, outlining the standards and norms of that operation as well as all relevant planning standards. All standards, norms and planning parameters, the geological model, infrastructure and environmental plans together with the structural plan, geotechnical review report, among others, are also considered. The market strategy, supply contracts and planned volumes drive the schedule. All operation standards must be signed off by the applicable mine management and Reserve Competent Person. A similar procedure is followed for projects with the project steering committee fulfilling the role of mine management. Reserve estimation may be conducted either as required (in a project-stage evaluation, for example) or as part of the annual Mineral Resource and Mineral Reserve estimation process. The data conversion, validation and verification report are the first outputs of this procedure.
Geological model validation	On receipt of the geological model, the validation procedure is conducted and the model is converted into a mining model. A report is then compiled with possible geological model anomalies, and a comparison of volumes in the geological model and mining model to confirm data conversion has been conducted correctly. This information is signed off as acceptable by the Resource Competent Person and manager: strategic mine planning and design.

How we report continued

Table 5: Summary of reserving process *continued*

ITEM	DESCRIPTION
The following components are included in the LoMP and Reserve estimation: exploitation strategy, operational methodology and pit shell.	
Exploitation strategy	The exploitation strategy needs to broadly demonstrate the pit/mining economics in terms of Resource boundaries, legal and other, such as servitudes. For example, when converting the Resource to Reserve, explain the economics, in terms of stripping ratio, underground versus open pit, among others. Lastly, the extraction sequence of mining different areas in terms of access, economics or other criteria deemed most appropriate.
Operational methodology considerations	Material flow explains the flow of material over time, such as open pit (ex-pit, horizontal and vertical distances and underground), geographical expansion versus stooping and deep pit (push-back strategy, minimum and maximum stripping curves). Equipment explains the size and type of equipment for the design, including life of equipment, major interventions and/or major changes (such as open pit to underground) over the life of the Resource. Waste dumps (size and position), rehabilitation (main issues and interventions) together with legal and other indicated licences obtained and required are included.
Pit shell	Pit shell is the final delineation or envelope of the Resource that will be converted to a Reserve. The LoMP pit shell is the foundation of the business case and, as such, is based on the most accurate information available Measured and Indicated Resources are used as basis for conversion.
Modifying factors	Coal Reserves are estimated using the relevant modifying factors at the time of reporting (mining, metallurgical, economic, marketing, legal, environmental, social and regulatory requirements). Modifying factors are signed off before Reserve estimation by the persons responsible for ensuring that all factors are timeously and appropriately considered. Comprehensive modifying factor sign-off and Reserve fact packs that record losses, recoveries/yields and other factors applied are documented in each independent Competent Persons' report. Resource volumes/tonnages are converted to Reserve tonnages by applying the following mining modifying factors: • Mining efficiency losses as per average cut thickness are applied to account for net losses of Reserves due to mining equipment selection and mining method. The efficiency factor also accounts for the thickness of the selected RoM and waste horizons relative to selected mining equipment. • Layout losses account for the loss of Reserves due to actual mining activities not reaching the defined Reserve boundary or due to the geometry of the Reserve block. • RoM extraction accounts for losses incurred using the selected mining method. • Contamination accounts for waste or inter-burden material unintentionally added to the mining horizon as a result of mining operations and equipment used. • Free moisture accounts for the change in the Reserve tonnage due to the addition of moisture from bench-mining operations.
Reserve classification	The Reserve classification methodology for Coal Reserves under Exxaro's control is governed by the Exxaro Coal Reserve estimation procedure, as described in the LoMP policy, and aligned with the SAMREC Code and SANS 10320:2020 edition 2 standard. In general, Measured Resources are converted to Proved Reserves and Indicated Resources are converted to Probable Reserves. If an operation or project has additional constraints, such a supply agreement that has not been finalised or a sales/marketing strategy that limits the profitability of the mine, the Measured Resources can be downgraded to Probable Reserves. In situations where this has been applied, it is clearly stated in the footnotes for the Reserves tables.
Inferred Resources	Where Inferred Resources were considered for LoM plans, the amount (Mt) and effect are always clearly stated. When Inferred Resources are included in the LoMP, these tonnages are never scheduled in the first five years of mine life. The rationale for considering Inferred Resources inclusion is explained and actions to address this issue are stated. Exxaro generally attempts to limit Inferred Resources to less than 15% of total Resources to be considered for LoMPs. Any inclusion of Inferred Resources must be tested, reported and modifying factors and assumptions that were applied to the Indicated and Measured Resources to determine the Coal Reserves must be equally applied to the Inferred Resources. However, Inferred Resources are not converted to Coal Reserves and are not stated as part of the Mineral Reserve. The amount of Inferred Resources considered for the reported LoMP is included in the Reserve statement.
Outputs	The following outputs are generated after successfully completing the procedure: validation and verification report, mining block model, exploitation strategy report, mining schedule and equipment strategy report, and Reserve estimation report.

Assurance

Assurance is implemented in terms of a three-tier system, aligned with the guidelines of Exxaro's Mineral Resource and Mineral Reserve reporting procedure, summarised as follows.

Tier 1

Mineral Resource and Mineral Reserve estimation is undertaken as per Exxaro's governance framework. Sign-offs are required at each stage and the process is **concluded** in a **formal sign-off session** by a panel comprising **Exxaro's lead Mineral Resource and Mineral Reserve Competent Persons, Competent Persons, domain experts and technical specialists.** Technical assurance is managed in terms of **dedicated standards.**

In 2021, **tier 1** assurance was undertaken for the Leeuwpan and Mafube operations. Geological data validation, data analysis and subsequent updating of geological and structural models were concluded in the reporting period. These models were peer reviewed by geosciences central experts for the two operations and the models were signed off by the applicable Competent Persons and their supporting technical teams.

Findings from the reviews were incorporated during the model update. The investigation of all Resource-related aspects of potentially migrating from a bench to coal sample model to provide us with the benefits of additional flexibility in product scheduling at our Grootegeluk coal mine is in progress. The LoMPs were reviewed at our Belfast and Matla operations as well as our Thabametsi project.

Tier 2

Internal reviews are scheduled and planned for a **three-year cycle** or when deemed necessary. The focus is on projects, and Resource and associated Reserve compliance with Exxaro's **governance framework,** while **ensuring accountability** and **consequence management.**

Table 6 (page 16) indicates the **tier 2** technical assurances conducted during the reporting year. Where technical findings were identified during reviews that may materially impact the business, remedial actions were recommended to ensure project robustness and shareholder return.

Tier 3

External audits are scheduled in a **three-year cycle** or at the discretion of the lead Competent Persons and entail a **full review** of the **Mineral Resource and Mineral Reserve estimation process** from **borehole logging** to Mineral Reserve **evaluation.**

On **tier 3,** in 2021, process audits were done by EY for the Leeuwpan operation. The audit scope was limited to the following modules:

- **Module 1:** Process audit
- **Module 2:** A high-level review of the 2021 Leeuwpan Resource model (covered in a separate report)

Module 1 conclusion: A satisfactory level of assurance was reported. Although there were four controls found to have some weaknesses, the existing key controls are considered to be generally adequate and effective to ensure that the objective of the process will be achieved. Reliance can therefore be placed on management's assessment and confirmation that key controls are consistently performed. Table 7 (page 17) indicates the recommendations made.

Module 2 conclusion: The Coal Resource has been prepared and documented in accordance with the SAMREC Code and SANS 102320:2020 requirements, and the process and methodologies are considered fit-for-purpose and within industry norms. The review of the geological model and Coal Resource classification has identified a number of recommendations, which are largely considered to be good housekeeping in nature. These aim to improve future models and, as such, do not materially affect the Coal Resource estimate. Table 8 (page 17) indicates the recommendations made.

Assurance continued

Table 6: Tier 2 technical assurances conducted in the reporting year with general points addressed

PROJECT NAME	PROJECT DESCRIPTION	SUMMARY RESOURCE ACTIONS	SUMMARY RESERVE ACTIONS
Grootegeluk complex (GGC) integrated water management strategy	Development of a water management strategy for GGC	The integrated water and salt balance model was reviewed, and no fatal flaws have been identified.	The inputs used in determining the shape and progression of the pit and backfill areas have been verified. The proposed strategy to prevent flooding and storage of large amounts of water in the pit is supported.
Belfast logistic solution prefeasibility study	Investigate cheaper logistical options to export product from Belfast mine	Farms that may be impacted by the alternative solutions was identified and, depending on the go-forward solution, geotechnical studies might be needed.	No impact is foreseen on current mining activities should any of the alternative logistics solutions be implemented.
Mafube debottlenecking project	Increasing Mafube throughput	Uncertainty about seam parting information was confirmed. Operational risk will be managed through the Mafube short-term model.	The proposed method of mining is consistent with the current operation and deemed appropriate to achieve increased mining volumes. It furthermore enhances Exxaro's early value strategy. The planned increase in the number of dozers and drills is supported to achieve increased production volumes.
Grootegeluk shovels strategy	To update the strategy to replace and refurbish shovels in GGC		The assumptions used in the determination of the shovel requirements were verified and deemed appropriate for the project to proceed to the next phase. The purchase of an additional Letourneau L-1850 FEL to cater for possible downtime (intime capacity demands) is supported.
Grootegeluk trucks strategy	To update the strategy to replace and rebuild trucks within GGC		The assumptions used in the determination of the truck requirements (such as haul routes, pit layouts, latest LoMP, direct operating hours and tempos among others) were verified. The reduction of four trucks to optimise the baseline is noted and deemed appropriate to maintain the LoMP.
Belfast mining contracting options	To study the most optimal mining strategy between owner versus contractor mining for Belfast mine		The study is considered a fair comparison of the contractor and owner options.

Table 7: Tier 3 external audit additional Module 1 recommendations

AREA UNDER REVIEW	CONCLUSION AND RECOMMENDATION*
Governance and reporting	Certain Exxaro standards, policies and procedures must be regularly reviewed and updated to refer to the SANS 10320:2020 edition 2. Procedures to be reviewed.
Coal Reserve estimation	The fact pack must include details of factors used in the conversion of Resources into Reserves (economic parameters and market assumptions).
	The LoM memo detailing the mine design not provided. The parameters were however contained in the Competent Persons' report.
	The financial model is not in line with the signed LoM scheduling memo provided.

**Findings were addressed, and corrective measures audited and closed.*

Table 8: Tier 3 external audit additional Module 2 recommendations

AREA UNDER REVIEW	CONCLUSION AND RECOMMENDATION*
Data collection	Core recovery should be recorded in the database for mineralised zones within each drill hole allowing for ease of reference in audits and tracking of adherence to SANS 10320:2020.
Geological modelling	Drill holes with rounded Easting (X), Northing (Y) and Elevation (Z) coordinates should be compared to the original survey certificates to ensure the accuracy of the database entries.
Coal Resource classification	An Ash cut-off should be considered to be in compliance with the definition of coal provided in the SANS code.

** Findings were addressed, and corrective measures were audited and closed.*

Environmental, social and governance (ESG) matters

Environmental management, including applicable authorisations that support our estimates, closure plans, allocated funding and associated risks are discussed in detail in Exxaro's ESG report available online under the investors tab.

ESG MANAGEMENT

Exxaro is a leader in business management with sound ESG principles that deliver sustainable economic returns and tangible benefits for all stakeholders. The group has been ranked #1 for ESG performance-selected resources company metrics in terms of the FTSE Russell ESG Index. Everything we do today is geared towards ensuring a safer and more productive tomorrow. Our sustainability is founded on creative, mutually constructive relationships and values we share with our stakeholders. We conduct our business activities in a way that creates success for Exxaro and for society. From how we mine to what we mine, we are stewarding our natural assets and social capital to uplift our communities.

CLIMATE CHANGE AND CARBON MANAGEMENT

Climate change resilience refers to our ability to adapt and succeed in the face of direct and indirect climate change impacts. In addition to addressing and managing these risks, it encompasses our ability to capitalise on the strategic opportunities presented by the shift to a lower-carbon and resource-constrained economy. Guided by our purpose, our Sustainable Growth and Impact strategy is designed to ensure we are able to manage the direct and indirect climate change impacts on our current portfolio while ensuring we are able to contribute to the low-carbon environment of the future.

Exxaro measures, manages and reports energy and carbon data in terms of the Greenhouse Gas Protocol. Our scope 1, 2 and 3 emissions are monitored and reported annually.

WATER USE MANAGEMENT

Water is a strategic natural resource for South Africa and our business. We are committed to responsible and sustainable water use as enshrined in our water management policy that focuses on efficient water reuse and recycling. The policy aligns with the legislated environmental framework mainly governed by the National Water Act, 1998 (Act 36 of 1998), supported by the integrated water resource management hierarchy issued by the Department of Water and Sanitation to prioritise mine and waste management decisions and actions.

TAILINGS MANAGEMENT

Exxaro implements various systems and programmes aimed at monitoring and ensuring compliance at all our tailings facilities. The operation, monitoring and decommissioning of the tailings dams are guided by comprehensive risk-based management and governance systems in line with internationally recognised good practice. The company aligns the management of tailings with the global industry standard on tailings management. Risk management is a major aspect of our asset management. It includes risk identification, implementation of controls and assessment of control performance verification. Internal and external reviews, which encompass assurance processes of the tailing dams, are managed and controlled in the company to manage the risks and ensure continuous improvement. All tailings facilities have a third-party appointed tailings dam operator who facilitates the maintenance and monitoring of tailings. All regulatory five-yearly inspections are conducted by a third-party consulting firm. There are dashboards and quarterly inspections are conducted on the tailings dams in an effort to promote continuous monitoring. Systems in place include training to equip all site engineers with the required technical skills to be able to carry out inspections, which include continuous oversight of the maintenance of the assets.

Exxaro is continuously developing new initiatives to ensure that all risks associated with the catastrophic failure of tailings dams are minimised. The company engages industry professionals to ensure that relevant developments in the industry are captured and incorporated in our framework for tailings management.

AIR QUALITY MANAGEMENT

Air quality management is among our top priorities due to the negative impacts of pollutants such as dust and particulate matter (PM10 and PM2.5) prevalent in mining areas.

Our mitigation measures include:

- Application of chemical dust suppressants on unpaved roads
- Adhering to all applicable legislative requirements
- Proactive air quality management planning
- Risk management
- Monitoring, measuring and reporting

WASTE MANAGEMENT

Cradle-to-grave management of waste is critical to maintain our licence to operate. We have a group environmental policy and waste management standard for hazardous and non-hazardous waste. Our waste management standard enforces a waste management hierarchy that promotes prevention, minimisation, reuse, recycling and energy recovery while ensuring safe waste disposal in line with the National Environmental Management: Waste Act, 2008 (Act 59 of 2008) and supporting legislation. The environmental policy introduced initiatives such as waste prevention, reuse, recycling, energy recovery and safe waste disposal to reduce environmental and health risks with sustainability in mind. Exxaro's business units receive a rebate for recycling waste such as paper, used oil and scrap metals.

BIODIVERSITY MANAGEMENT

One of the fundamental goals for Exxaro is to be a low-impact, high-value organisation for this generation and those to follow. A key aspect of achieving this goal is ensuring that all Exxaro mines coexist in harmony with the natural environment in which they operate. This is achieved through many positive biodiversity initiatives and programmes implemented at various mines. These various initiatives and programmes not only protect indigenous flora and fauna species but also ensure the expansion of such species to support ecosystems within and beyond Exxaro's operations. Exxaro is committed to exceeding its biodiversity goals and plans a legacy in which current and future generations can enjoy the benefits of a clean and flourishing natural environment.

LAND AND HERITAGE MANAGEMENT

Exxaro focuses on sustainable management of land owned by its subsidiaries. Sustainable land management is a balanced approach of economic application, ecological preservation and the social needs of legal occupiers and hosting communities.

REHABILITATION AND CLOSURE

Our business operations review mine closure and rehabilitation financial provisions every year. Rehabilitation plans and closure objectives are amended after environmental management programme performance assessments. Cost estimates of activities in the concurrent and final closure rehabilitation programme are reviewed and adjusted. External auditors visit our sites, review documents and audit the provisions twice a year.

Operational closure, concurrent rehabilitation and land management are part of Exxaro's operating philosophy and moral responsibility. We actively plan our operations with closure in mind, ensuring adequate financial resources are available to meet our rehabilitation commitments.

Summarised Group Mineral Resource and Mineral Reserve estimates

The reported Mineral Resources and Mineral Reserves remaining as at 31 December 2021 are indicated in this section. Mineral Resource and Mineral Reserve figures are not an inventory of all mineral occurrences drilled or sampled but a realistic record of those, under assumed and justifiable technical and economic conditions, that may be economically extractable currently and in future.

Mineral Resources and Mineral Reserves are reported inclusive of Mineral Resources that have been converted to Mineral Reserves. An exception is reporting for Gamsberg and Black Mountain Mining (BMM) because figures received from Vedanta Resources (JORC Code) represent Mineral Resources excluding Mineral Resources converted to Mineral Reserves.

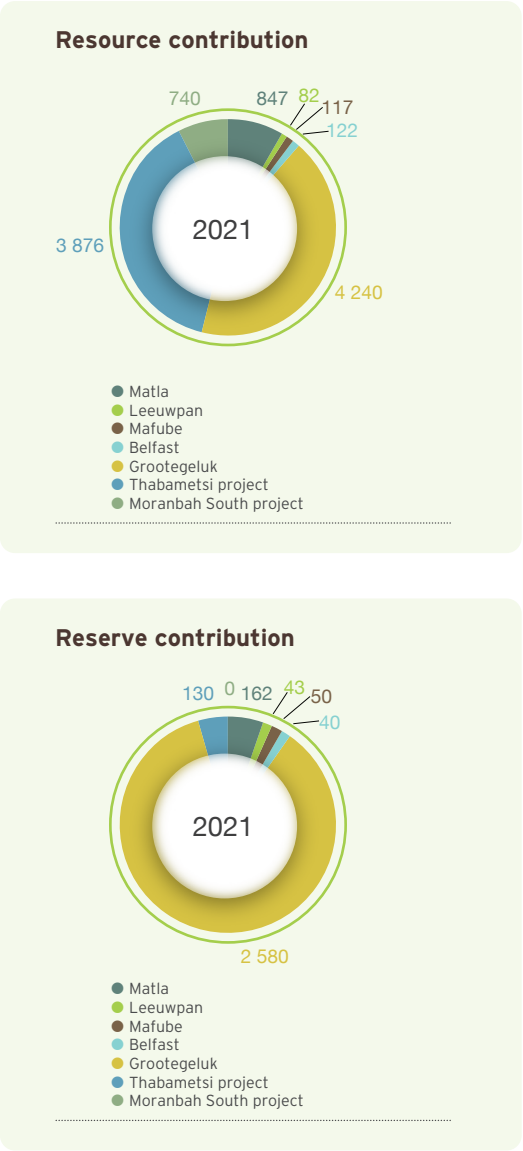
In addition, we provide Resource estimates within LoMP and insight into all applicable modifying factors. Exxaro includes all estimates directly under its management control and estimates of entities in which Exxaro holds a 25% interest or larger. Mineral Resources and Mineral Reserves are reported at 100% irrespective of the percentage attributable to Exxaro.

Explanations for material changes in year-on-year movements are provided as footnotes in the Mineral Resources and Mineral Reserves tables.

Total attributable coal resources and coal reserves

Commodity: Coal	Category	2021 MTIS (Mt)
Exxaro attributable tonnes	Measured	3 831
	Indicated	2 422
	Inferred	3 342
	Total Coal Resources	9 595
	Proved	1 897
	Probable	1 083
	Total Coal Reserves	2 980

Figure 6: Exxaro's Coal Resource and Coal Reserve attributable contribution

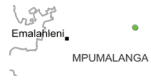
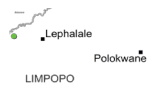


Summarised Group Mineral Resource and Mineral Reserve estimates continued

COAL RESOURCES

The table below details the total inclusive Coal Resources estimated as at 31 December 2021.

Table 9: Coal Resources and qualities

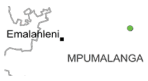
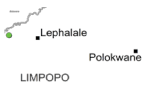
Operation[1]	Location[3]	Resource category	2021 Tonnes and quality[4] Tonnes (Mt)	CV MJ/kg	% Ash	% IM	% VM	% S	2020 Tonnes and quality[4] Tonnes (Mt)	CV MJ/kg	% Ash	% IM	% VM	% S	% change in tonnes[5]
Matla mine[6] (UG) (captive market) Mpumalanga 100% attributed to Exxaro[2]		Measured	639	20.6	29.6	4.6	20.6	1.0	694	20.5	29.9	4.5	22.2	1.0	(8)
		Indicated	114	20.7	28.7	4.5	20.7	0.8	123	20.4	29.4	4.5	22.1	0.8	(7)
		Inferred	93	21.0	28.1	4.4	21.0	0.8	151	19.4	31.8	4.6	20.7	0.9	(38)
		Total	847	20.7	29.3	4.5	20.7	1.0	969	20.3	30.2	4.5	21.9	0.9	(13)
	Resources inside LoMP		281	21.3	27.7	4.8	23.1	1.0	290	21.3	27.7	4.8	22.9	1.0	(3)
Leeuwpan mine[7] (OC) (commercial market) Mpumalanga 100% attributed to Exxaro[2]		Measured	77.9	20.0	31.3	3.2	18.6	1.2	79.9	20.1	31.3	3.2	18.7	1.2	(2)
		Indicated							2.6	21.9	26.9	3.3	21.2	1.3	(100)
		Inferred	3.6	20.1	34.6	2.6	14.7	1.0	3.6	20.1	34.6	2.6	14.7	1.0	—
		Total	81.5	20.0	31.5	3.2	18.4	1.2	86.1	20.1	31.3	3.2	18.6	1.2	(5)
	Resources inside LoMP		49.1	20.0	30.6	3.1	19.5	1.3	52.6	20.1	30.7	3.1	19.6	1.3	(7)
Mafube mine (OC) (commercial market) Mpumalanga 50% attributed to Exxaro[2]		Measured	104.3	21.4	26.8	3.9	22.1	1.0	111.2	21.6	26.2	3.8	22.5	1.0	(6)
		Indicated	9.9	21.7	26.0	3.9	22.4	1.0	9.9	21.7	26.0	3.9	22.4	1.0	—
		Inferred	2.6	21.7	25.9	3.9	22.1	0.9	2.6	21.7	25.9	3.8	22.1	0.9	—
		Total	116.8	21.5	26.7	3.9	22.1	1.0	123.7	21.6	26.1	3.8	22.5	1.0	(6)
	Resources inside LoMP		53.4	22.0	25.6	4.0	22.0	1.1	59.2	22.2	24.5	3.8	22.9	1.0	(10)
Belfast mine (OC/UG) (mining right) Mpumalanga 100% attributed to Exxaro[2]		Measured	68.3	24.8	18.6	3.6	23.2	1.1	71.3	24.8	18.5	3.6	23.3	1.1	(4)
		Indicated	19.9	22.3	25.3	3.6	22.0	1.1	19.9	22.3	25.3	3.6	22.0	1.1	—
		Inferred	33.8	21.5	27.0	3.4	20.9	0.8	34.0	21.5	26.9	3.4	20.9	0.8	(1)
		Total	121.9	23.5	22.0	3.5	22.4	1.0	125.3	23.5	21.9	3.5	22.4	1.0	(3)
	Resources inside LoMP		41.1	25.0	18.5	3.5	23.5	1.2	44.2	25.0	18.4	3.5	23.5	1.2	(7)
Grootegeluk mine (OC) (commercial market) Limpopo 100% attributed to Exxaro[2]	Volksrust Formation	Measured	1 833	14.1	54.8	1.7	19.6	1.2	1 876	14.1	54.8	1.7	19.6	1.2	(2)
		Indicated	1 118	14.1	55.0	1.7	19.6	1.2	1 119	14.1	55.0	1.7	19.6	1.2	—
		Inferred	262	14.3	54.0	1.8	19.8	1.4	262	14.3	54.0	1.8	19.8	1.4	—
		Total	3 213	14.1	54.8	1.7	19.6	1.2	3 256	14.1	54.8	1.7	19.6	1.2	(1)
	Resources inside LoMP		2 312	14.2	54.6	1.7	19.8	1.2	2 355	14.2	54.6	1.7	19.8	1.2	(2)
Grootegeluk mine (OC) (commercial market) Limpopo 100% attributed to Exxaro[2]	Vryheid Formation	Measured	648	24.0	27.4	1.8	22.2	2.2	657	24.0	27.4	1.8	22.2	2.2	(1)
		Indicated	303	23.7	28.4	1.7	22.1	2.3	303	23.7	28.4	1.7	22.1	2.3	—
		Inferred	76	23.6	28.9	1.7	21.5	2.2	76	23.6	28.9	1.7	21.5	2.2	—
		Total	1 027	23.9	27.8	1.8	22.1	2.2	1 036	23.9	27.8	1.8	22.1	2.2	(1)
	Resources inside LoMP		601	23.8	27.9	1.8	22.3	2.3	607	23.9	28.0	1.8	22.4	2.3	(1)
Total Grootegeluk mine (OC) (commercial market) Limpopo 100% attributed to Exxaro[2]		Measured	2 481	16.7	47.7	1.8	20.3	1.5	2 532	16.7	47.7	1.8	20.3	1.5	(2)
		Indicated	1 421	16.1	49.3	1.7	20.1	1.4	1 422	16.1	49.3	1.7	20.1	1.4	—
		Inferred	338	16.4	48.4	1.8	20.2	1.6	338	16.4	48.4	1.8	20.2	1.6	—
		Total	4 240	16.5	48.3	1.8	20.2	1.5	4 291	16.5	48.3	1.8	20.2	1.5	(1)
	Resources inside Grootegeluk opencast LoMP		2 913	16.2	49.1	1.7	20.3	1.4	2 965	16.2	49.1	1.7	20.3	1.4	(2)
Thabametsi project (OC/UG) (mining right) Limpopo 100% attributed to Exxaro[2]		Measured	270	13.0	52.3	1.9	20.0	1.2	270	13.0	52.3	1.9	20.0	1.2	—
		Indicated	749	12.6	53.1	1.8	19.8	1.1	749	12.6	53.1	1.8	19.8	1.1	—
		Inferred	2 857	12.7	52.7	1.9	19.3	1.3	2 857	12.7	52.7	1.9	19.3	1.3	—
		Total	3 876	12.7	52.7	1.9	19.5	1.3	3 876	12.7	52.7	1.9	19.7	1.3	—
	Resources inside IPP LoMP		133	12.0	54.7	1.9	20.0	1.0	133	12.0	54.7	1.9	20.0	1.0	—
Moranbah South project[8] (UG) (prospecting) Australia 50% attributed to Exxaro[2]		Measured	484.6	26.9	23.6	2.6	18.5	0.6	482.0	26.7	23.7	2.6	18.5	0.6	1
		Indicated	226.0	27.4	21.4	2.6	17.8	0.5	222.0	27.3	21.7	2.6	17.9	0.6	2
		Inferred	29.7	28.2	19.6	2.7	16.9	0.5	28.0	28.5	18.9	2.7	17.0	0.5	6
		Total	740.4	27.1	22.8	2.6	18.2	0.6	732.0	27.0	22.9	2.6	18.3	0.6	1

• Rounding of figures may cause computational discrepancies.
• All changes more than 10% in the total Resources of an operation are explained. Tonnages are quoted in metric tonnes and million tonnes is abbreviated as Mt.
• Coal Resources and qualities (raw coal) are quoted on MTIS and air-dried basis.
• Coal Resources are quoted inclusive of Coal Resources that have been modified to Coal Reserves unless otherwise stated.
• Resources inside LoMP refer to MTIS Resources in LoMP layout.
• Thickness and quality cut-offs applied at each project or mine are stated in the ancillary section.
[1] Operation refers to operating mine or significant project. The mining methods are opencast (OC) and underground (UG).
[2] Figures are reported at 100% irrespective of percentage attributable to Exxaro and refer to 2021 only.
[3] Locality maps are for illustrative purposes only. Detailed maps are provided in the ancillary section.
[4] Raw coal qualities (air-dried basis). CV: calorific value (gross), ash content (ash), IM: inherent moisture, S: total sulphur and VM: volatile matter.
[5] The percentage difference between 2021 reported MTIS and 2020 reported MTIS with brackets signifying a negative.
[6] The change is predominantly the result of the removal of remnant coal blocks not meeting RPEEE criteria.
[7] The movement between categories is the result of infill drilling in the OI west area, upgrading the Indicated to Measured Resources.
[8] Estimates are received from Anglo American Metallurgical Coal Proprietary Limited and not audited by Exxaro.

COAL RESERVES

The table below details the total Coal Reserves estimated as at 31 December 2021.

Table 10: Coal Reserves

				2021					2020					
				RoM and saleable tonnes[5]					RoM and saleable tonnes[5]					
Operation[1]	**Location[3]**	**LoM (years)[4]**	**Category**	**RoM (Mt)**	**RoM moisture %**	**Export (Mt)**	**Thermal (Mt)**	**Metal-lurgical (Mt)**	**RoM (Mt)**	**RoM moisture %**	**Export (Mt)**	**Thermal (Mt)**	**Metal-lurgical (Mt)**	**% change in RoM[6]**
Matla[7] (UG) (captive market) 100% attributed to Exxaro[2]		3+	Proved	124	9.1		138		148	7.7		148		(16)
			Probable	38	8.9		23		22	9.7		22		74
			Total	162	9.1		162		169	8.0		169		(4)
			Inferred Resources inside LoMP	8					8					(10)
Leeuwpan[8] (OC) (commercial market) 100% attributed to Exxaro[2]		8	Proved	40.2	3.1		27.3		42.0	3.1		27.8		(4)
			Probable	3.2	2.6			1.9	5.7	2.8		2.0	1.9	(44)
			Total	43.5	3.1		27.3	1.9	47.8	3.1		29.8	1.9	(9)
			Inferred Resources inside LoMP											
Mafube[9] (OC) (commercial market) 50% attributed to Exxaro[2]		10	Proved	26.7	5.7	18.0			32.1	5.7	21.1			(17)
			Probable	23.0	5.8	14.8			23.0	5.8	14.8			—
			Total	49.7	5.7	32.8			55.1	5.7	35.9			(10)
			Inferred Resources inside LoMP	1.7					1.7					—
Belfast[10] (OC) (commercial market) 100% attributed to Exxaro[2]		12	Proved	37.5	3.4	33.3			40.2	3.3	36.5			(7)
			Probable	2.4	2.6	1.8			2.1	2.9	1.7			14
			Total	39.9	3.3	35.1			42.3	3.3	38.2			(6)
			Inferred Resources inside LoMP	0.5					0.5					—
Waterberg Complex														
Grootegeluk mine (OC) (commercial market) 100% attributed to Exxaro[2]		20+	Proved	1 682	3.0	109	689	39	1 730	3.0	113	712	40	(3)
			Probable	898	3.0	58	368	21	898	3.0	59	370	21	—
			Total	2 580	3.0	168	1 057	59	2 628	3.0	171	1 082	61	(2)
			Inferred Resources inside LoMP	137					137					—
Thabametsi project[11] (OC) (IPP market) 100% attributed to Exxaro[2]		25	Proved											
			Probable	130	3.0		127		130	3.0		127		—
			Total	130	3.0		127		130	3.0		127		—
			Inferred Resources inside LoMP											

• Rounding of figures may cause computational discrepancies.
• Tonnages are quoted in metric tonnes and million tonnes is abbreviated as Mt.
• Inferred Resources inside LoMP refer to Inferred Resources considered for the LoMP. These Resources have not been converted to Reserves.
• Coal Reserves are quoted on a RoM Reserve tonnage basis, which represents tonnages delivered to the plant at an applicable moisture and quality basis.
• Saleable Reserve tonnage represents the product tonnes of coal available for sale on an applicable moisture basis.
• All changes more than 10% in the total Reserves of an operation are explained.
• Resource to Reserve modifying factors per operation are stated in the ancillary section.

[1] Operation refers to operating mine or significant project. Mining method: opencast (OC) or underground (UG).
[2] Figures are reported at 100% irrespective of percentage attributable to Exxaro and refer to 2021 only.
[3] Locality maps are for illustrative purposes only. Detailed maps are provided in the ancillary section.
[4] The + symbol is used in instances where the scheduled LoMP extends beyond the expiry of the mining right. In each instance, Exxaro has a reasonable expectation that the mining right will be renewed.
[5] Export refers to export thermal coal except at Grootegeluk mine where it refers to semi-soft coking coal suitable for the export and inland markets.
[6] The percentage difference between 2021 reported RoM and 2020 reported RoM, and the percentage difference between 2021 reported total saleable tonnes and 2020 reported total saleable tonnes. Brackets signify a negative.
[7] Movement between categories is primarily the result of stooping areas downgraded to Probable Reserves (~15Mt) without surface ownership.
[8] Movement from Probable to Proved reflects the change in the Resource. The increase in the LoM year is due to the adjustment in annual RoM volumes.
[9] Decrease is primarily the result of mining depletion (5.2Mt).
[10] Increase in Probable is the result of a new mine layout. The increase in the LoM year is due to the adjustment in annual RoM volumes.
[11] The Coal Reserve is reported as Probable as a result of the lapse of the IPP project development agreement.

Summarised Group Mineral Resource and Mineral Reserve estimates continued

COAL RESERVES continued

Table 11: Coal Reserve qualities

		THERMAL saleable (Proved + Probable)						METALLURGICAL saleable (Proved + Probable)						COKING saleable (Proved + Probable)					
Operation	**Seam/layer**	**Tonnes (Mt)[1]**	**CV MJ/kg**	**% VM**	**% Ash**	**% S**	**Yield %**	**Tonnes (Mt)[1]**	**CV MJ/kg**	**% VM**	**% Ash**	**% S**	**Yield %**	**Tonnes (Mt)[1]**	**CV MJ/kg**	**% VM**	**% Ash**	**% S**	**Yield %**
Matla mine	Seam 2	62	22.6	24.8	22.7	0.8	100.0												
	Seam 4	100	19.5	23.5	29.3	1.0	100.0												
Leeuwpan mine	TC[2]	10.7	22.3	19.2	27.3	1.0	62.8												
	BC[2]	16.6	24.0	24.1	21.5	0.9	66.8	1.9	27.8	8.4	15.0	0.9	57.7						
Mafube mine	Middlings	12.7	21.7	19.9	25.8	0.4	24.3												
	Export	20.2	26.6	26.1	13.3	0.4	39.7												
Belfast mine	Export	35.1	25.4	23.2	17.1	0.6	88.1												
Grootegeluk mine	All seams	1 057	21.2	24.4	32.7	1.5	40.7	59	28.9	23.8	13.6	0.6	61.3	168	29.0	35.1	11.9	1.1	12.9
Thabametsi Project[3]	T1	64	12.7	20.0	53.9	1.1	98.0												
	T2	63	11.3	19.0	55.7	1.0	98.0												

• Rounding of figures may cause computational discrepancies.
• Volatile matter (VM), sulphur (S), ash content (ash) and gross calorific value (CV).
• Saleable Coal Reserve tonnage represents the product tonnes of coal available for sale on an applicable moisture and air-dried quality basis.
[1] Saleable product tonnages are quoted in metric tonnes and million tonnes is abbreviated as Mt.
[2] Top coal (TC) and bottom coal (BC).
[3] Based on Thabametsi bench configuration as defined in phase 1 of the feasibility study.

BASE METAL RESOURCES AND RESERVES

The table below details Base Metal Resources (exclusive) as at 31 March 2021.

Table 12: Base Metals Resources (exclusive) reported

		2021					2020					
		Tonnes and grade					Tonnes and grade					
Operation[1]	**Category**	**Tonnes (Mt)**	**% Zn**	**% Pb**	**% Cu**	**Ag g/t**	**Tonnes (Mt)**	**% Zn**	**% Pb**	**% Cu**	**Ag g/t**	**% Change in RoM**
Deeps mine[3] Northern Cape (UG) (zinc, lead, copper and silver) 26% attributed to Exxaro[2]	Measured	4.4	2.9	3.2	0.3	34.0	3.3	3.2	3.6	0.3	38.5	35
	Indicated	5.9	3.0	2.2	0.5	31.0	3.9	3.2	2.7	0.5	37.1	51
	Inferred											
	Total	10.3	3.0	2.6	0.4	32.0	7.2	3.2	3.1	0.5	37.7	44
Swartberg mine[4] Northern Cape (OC/UG) (zinc, lead, copper and silver) 26% attributed to Exxaro[2]	Measured											
	Indicated	72.6	0.9	2.4	0.3	43.0	63.7	0.9	2.6	0.3	45.4	14
	Inferred	19.0	1.4	2.6	0.2	46.0	19.1	1.1	2.8	0.2	45.4	(1)
	Total	91.6	1.0	2.4	0.3	43.0	82.8	1.0	2.7	0.3	45.4	11
Big Syncline project[5] Northern Cape (OC) (zinc) 26% attributed to Exxaro[2]	Measured											
	Indicated	6.1	3.0	1.1		16.0	6.1	3.0	1.1		15.5	0
	Inferred	185.6	2.4	1.0		12.0	161.8	2.5	1.0		12.3	15
	Total	191.7	2.5	1.0		12.0	167.9	2.5	1.0		12.4	14
Gamsberg North mine[6] Northern Cape (OC/UG) (zinc) 26% attributed to Exxaro[2]	Measured	1.5	6.7	0.5			1.7	6.6	0.5			(11)
	Indicated	34.8	6.0	0.5			38.5	5.9	0.5			(10)
	Inferred	5.0	8.3	0.5			17.9	5.8	0.5			(72)
	Total	41.3	6.3	0.5			58.1	5.9	0.5			(29)
Gamsberg East[7] Northern Cape (project) (zinc) 26% attributed to Exxaro[2]	Measured											
	Indicated											
	Inferred	49.8	8.5	0.5			48.5	8.5	0.5			3
	Total	49.8	8.5	0.5			48.5	8.5	0.5			3
Gamsberg South[8] Northern Cape (project) (zinc) 26% attributed to Exxaro[2]	Measured											
	Indicated											
	Inferred	23.2	7.1	0.6								
	Total	23.2	7.1	0.6								

- *Rounding of figures may cause computational discrepancies.*
- *Percentage zinc (% Zn), percentage copper (% Cu), percentage lead (% Pb), grams per tonne silver (Ag g/t).*
- *Tonnages are quoted in metric tonnes and million tonnes is abbreviated as Mt.*
- *Estimates as received from Vedanta Resources at 31 March 2021 and not audited by Exxaro.*
- *All changes more than 10% are explained.*
- *Tonnages are reported on a dry basis.*

[1] *Operation refers to the BMM operating mine or significant project. Mining method: opencast (OC) or underground (UG).*
[2] *Figures are reported at 100% irrespective of percentage attributable to Exxaro.*
[3] *The increase is mainly the result of changes to wireframes and commodity prices.*
[4] *The increase is mainly the result of additional exploration and upgrade of Inferred material to Indicated.*
[5] *Big Syncline is a brownfields exploration project. This is a high-volume, low-grade Zn deposit. The increase is the result of changes to Resource reporting criteria with increased commodity prices.*
[6] *The decrease is the result of Resources being transferred to Reserves.*
[7] *The increase is mainly the result of changes to reporting criteria with increased commodity prices.*
[8] *Gamsberg South lies to the south of the Gamsberg open pit and was declared for the first time in 2021.*

Ancillary Resource and Reserve information by operation

BASE METAL RESOURCES AND RESERVES continued

Table 13: Base Metals Reserves reported

Operation[1]	LoM (years)	Category	2021 Grade and contained metals RoM (Mt)[3]	2021 % Zn	2021 % Pb	2021 % Cu	2021 Ag g/t	2020 Grade and contained metals RoM (Mt)[3]	2020 % Zn	2020 % Pb	2020 % Cu	2020 Ag g/t	% Change in RoM
BMM Deeps mine[3] Northern Cape (UG) (zinc, lead, copper and silver) 26% attributed to Exxaro[2]	3	Proved	1.3	2.7	3.5	0.3	35.0	1.5	2.9	3.4	0.3	35.2	(11)
		Probable	2.9	2.9	1.4	0.7	20.0	2.5	3.1	1.6	0.7	21.1	18
		Total	4.2	2.8	2	0.5	24.0	3.9	3.0	2.3	0.5	26.4	7
		Inferred Resources inside LoMP						—					
BMM Swartberg mine[4] Northern Cape (OC/UG) (zinc, lead, copper and silver) 26% attributed to Exxaro[2]	3	Proved											
		Probable	24.4	0.5	1.8	0.5	22.0	25.4	0.5	1.7	0.5	21.6	(4)
		Total	24.4	0.5	1.8	0.5	22.0	25.4	0.5	1.7	0.5	21.6	(4)
		Inferred Resources inside LoMP						—					
Gamsberg North mine[5] Northern Cape (OC) (zinc) 26% attributed to Exxaro[2]	12	Proved	79.4	6.5	0.5			78.2	6.4	0.5			2
		Probable	30.9	5.2	0.5			29.9	5.2	0.5			3
		Total	110.4	6.1	0.5			108.1	6.1	0.5			2
		Inferred Resources inside LoMP											

- *Rounding of figures may cause computational discrepancies.*
- *Percentage zinc (% Zn), percentage copper (% Cu), percentage lead (% Pb), grams per tonne silver (Ag g/t).*
- *Tonnages are quoted in metric tonnes and million tonnes is abbreviated as Mt.*
- *Reserves are quoted on a RoM) Reserve tonnage basis, which represents tonnages delivered to the plant at applicable moisture and quality.*
- *Inferred Resources in LoM plan refer to Inferred Resources considered for LoM plan.*
- *Estimates as received from Vedanta Resources at 31 March 2021 and not audited by Exxaro.*
- *All changes more than 10% are explained.*

[1] *Operation refers to the BMM operating mine or significant project. Mining method: opencast (OC) or underground (UG).*
[2] *Figures are reported at 100% irrespective of percentage attributable to Exxaro and refer to March 2021 only.*
[3] *The net increase is the result of both Resource transferred to Reserve and mining depletion.*
[4] *The decrease is due to mining depletion.*
[5] *The increase is due to transferral of exclusive Resources into Reserves.*

Silo at ECC

BELFAST

Belfast has four operating opencast pits with the latest addition, Pit 4B, opened in 2021. The opening of this pit was a culmination of the successful implementation of the early value strategy, additional drilling, updating of the short-term model, which led to the identification of additional resources, reviewing of the LoM and a culture to succeed.

Belfast overview

Table 14: Belfast overview

TOPIC	INFORMATION	
Location	10km south-west of the town of Belfast in Mpumalanga, South Africa	
History	**Previous ownership**	**Material notes**
1967	Fuel Research Institute of South Africa	Coal Resource delineation drilling
1969	Trans-Natal Steenkoolkorporasie Beperk	Coal Resource delineation drilling
1975 to 1983	Gold Fields Mining and Development	Coal Resource delineation drilling
2001 to 2003	Eyesizwe	Coal Resource delineation drilling
2008 to 2021	Exxaro	Drilling to delineate Coal Resource, detailed box-cut designs, five-year mine plan infill drilling and Belfast expansion project. The mine produced first coal in April 2019, ramping up in 2020 with full production from 2021.
Adjacent properties	The mineral tenure areas of Umsimbithi Mining (Wonderfontein coal mine) and Universal Coal (Paardeplaats) are to the west and north of Belfast respectively.	
Infrastructure	Belfast mine is adjacent to the N4 highway connecting Pretoria and Maputo, and can be accessed from the N4 via two district roads, namely D1110 and D1770. The mine is also adjacent to the railway line to Maputo. Nearby loading facilities connect the railway line to the Richards Bay Coal Terminal. Existing Eskom power lines are on the property for electricity supply. Water is sourced on site as per the integrated water use licence specification. Potable water is sourced from authorised water drill holes, and process water for dust suppression and running of the beneficiation plant is sourced through dewatering from the pits.	
Coalfield	Belfast mine is situated on the far eastern edge of the Witbank coalfield. The coalfield extends about 190km east-west between the towns of Springs and Belfast, and about 60km in a north-south direction between the towns of Middelburg and Ermelo. The Witbank coalfield has up to five coal seams in the middle Ecca group sediments of the Karoo supergroup. The Karoo sequence in the area is represented by the Dwyka formation and the middle Ecca with little or no lower Ecca development. The middle Ecca sequence of coal horizons, interbedded with sediments, is highly truncated due to erosion with only very minor areas where the full sequence is developed.	
Main seams	Seam 2	
Seam development	Locally, mainly three seams are targeted (S2, S3 and S4). S5 was intersected in only two drill holes in the northern part of the project area. S2, the most prevalent seam, is consistently developed, except in areas where it has been eroded. It has an average thickness of 2.8m and gently dips to the south. Both S3 and S4 are sporadically developed due to erosion and both have an average thickness of 0.6m.	
Depositional control	Due to the mine's proximity to the northern edge of the Witbank basin, the primary control of coal development is the current weathering surface. The deposit is divided, by a perennial stream, into two resource blocks under two distinct spurs in the surface topography. There is no indication of pertinent faulting from the drill hole information but potential intrusions of dolerite dykes are outlined by regional airborne magnetics, indicating the possible occurrence of regional north-south trending dykes. There are no known geological structures that may affect the geology or coal seam continuity.	
Resources and Reserves	Resources occur within most of the mining right whereas the Reserve is limited to the southern mining right area, aligned with the existing LoMP.	
Mining method	Currently, mining takes place from four open pits using the doze-over, truck and shovel hybrid mining method. 10 opencast pits have been identified as per LoM. Four to five will operate concurrently. There are prospects for additional opencast pits and an underground mining section in the BEP area.	

Ancillary Resource and Reserve information by operation continued

Belfast overview

Table 14: Belfast overview *continued*

TOPIC	INFORMATION
Beneficiation	Thermal coal is beneficiated in a two-stage dense medium separation plant.
Product	CV 4 800kcal/kg, 5 300kcal/kg, 5 750kcal/kg and 5 900kcal/kg air dried
Market	Export market
Mining right	Belfast has an approved mining right that covers 5 818 hectares (ha).
Environmental approvals	All environmental appeals have been favourably addressed for the declared Reserves.
Projects/Feasibility studies	The BEP was initiated in 2019 to review the current exploitation strategy, including testing economic viability (macro-economic outlook) of the northern area considering open-cut and underground mining scenarios. This process led to the implementation of a new exploitation strategy through which the schedule was optimised to align with the Exxaro early value extraction strategy over the remaining LoM. The BEP prefeasability study is progressing well with outcomes expected in quarter three of 2022, confirming if the study will proceed or terminate.

Figure 7: Belfast mine

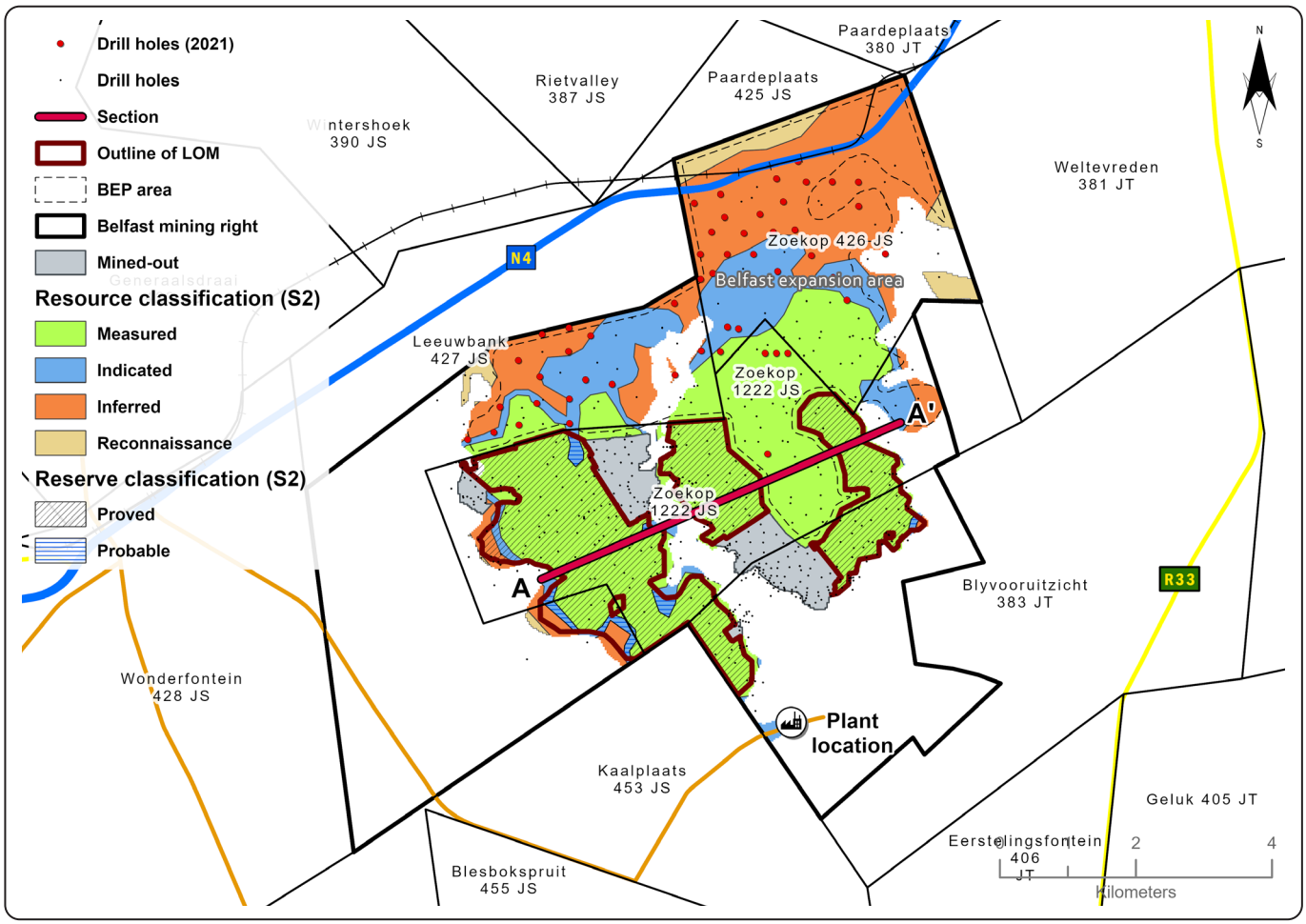
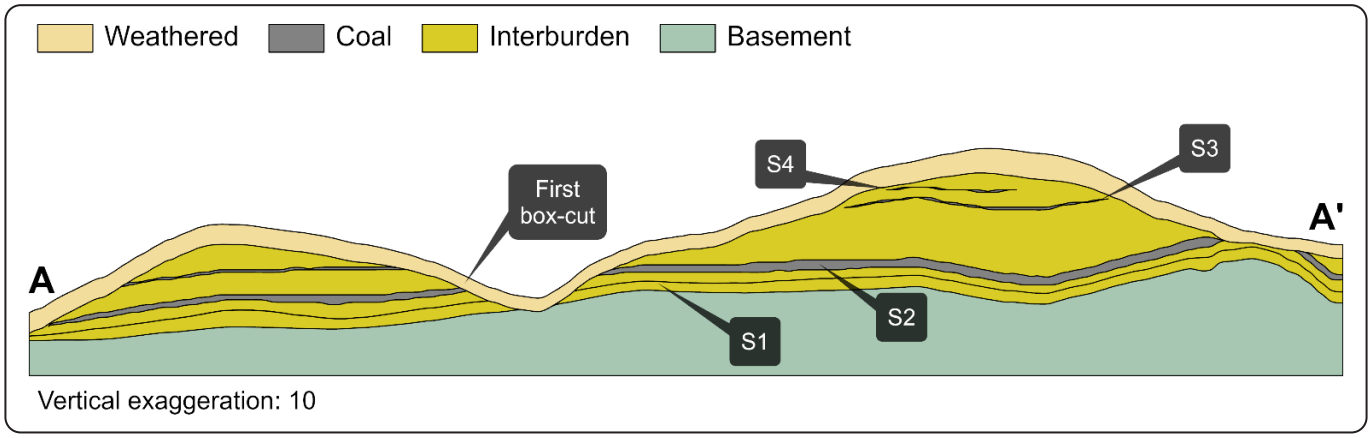


Figure 8: Belfast west-east cross-section



Resource estimation

Table 15: Resource estimation methodology and reporting

PROCESS	INFORMATION
Drilling, logging and sampling	Since 2019, most vertical surface drill holes have been wireline logged as per Exxaro procedure. Drilling is mainly focused on delineating the split between soft and hard OVB to support geotechnical characterisation as well as enhanced seam roof and floor mapping to delineate areas of seam floor rolls, seam thinning, seam thickening and seam pinching. Photographs of the core are taken after marking the core. Geological information is captured on log sheets with lithology captured up to cm details. Sampling is conducted on site with the aid of wireline logs.
Laboratory and accreditation	SGS and SANAS T0561
Laboratory dispatch and receiving process	All samples collected and bagged are registered in a sample sheet, which is also used as a dispatch sheet. The dispatch sheet is signed by the receiving laboratory personnel after ensuring that the number and sample identity (ID) on the dispatch sheet matches that of the actual samples to be analysed. Once the laboratory receives and signs the dispatch sheet, it is responsible for safekeeping and storage of that batch of samples.
Laboratory quality control and quality assurance	Emphasis is placed on ensuring data integrity through rigorous procedures and supervision while processing. As part of the assurance and control process, audits are performed internally and externally. SGS is accredited for analytical work and participates in monthly local and international round robins.
Data datum	WGS 84 – LO29
Drill hole database	acQuire
Number of drill holes in mining right	676
Number of drill holes used for Resource estimation	616
Number of drill holes used for classification	309
Data compositing and weighting	acQuire
Data validation	Conducted using queries in acQuire and Excel
Geological modelling software	Geovia Minex™
Estimation technique	Growth algorithm
Previous model date	2012
Last model update	2018
Grid mesh size	25m x 25m
Scan distance	3 000m
Data boundary	200m

Ancillary Resource and Reserve information by operation continued

BELFAST continued

Resource estimation continued

Table 15: Resource estimation methodology and reporting continued

PROCESS	INFORMATION
Model build limits	Upper: limit of weathering and topography/collar Lower: basement/Dwyka
Model outputs	Roof, floor and thickness grids generated for structure Raw and wash quality grids
Changes to modelling process	None
Thickness cut-off and extraction height considerations	Opencast ≤ 0.5m Underground ≤ 1.2m (current proposed UG exploitation plan was used as a baseline for UG minimum thickness cut-off)
Quality cut-offs (adb)	Ash ≥50%
Geological loss applied	5%

Table 16: Resource classification criteria

CATEGORY	TYPE OF DRILL HOLES	DRILL HOLE SPACING	STRUCTURALLY COMPLEX AREAS	DRILL HOLES/HA
Measured	Cored drill holes with applicable coal qualities	0m to 350m	May be more conservative after consideration of RODA	0.08
Indicated	Cored drill holes with applicable coal qualities	350m to 500m	May be more conservative after consideration of RODA	0.04
Inferred	Cored drill holes with applicable coal qualities	500m to 1 000m	May be more conservative after consideration of RODA	0.01

Table 17: RPEEE considerations

ITEM	CRITERIA	CRITERIA MET	COMMENT
Geological data	Data has been validated and signed off by Competent Person	Yes	Geological structures and depositional extent are considered as well as seam thickness ≤0.5m (OC) and ≤1.2m (UG), ≥50% ash content with coal qualities reported on an air-dried basis
Geological model	Geological model has been considered and signed off	Yes	
Structural model	Structural model was considered and signed off	Yes	2018
Mining	Mining assumptions considered and defined	Yes	Opencast and underground
Assurance	Exxaro internal audits and external audit conducted	Yes	Internal review in 2019 and external audit by EY in 2020
Economic evaluation	Exploitation study with economic and mining assumptions, including geotechnical and geohydrological assumptions	Yes	Belfast exploitation strategy over mining right (2020)
Environmental	Reasonable demonstration that environmental approvals can be obtained within the context of local, regional and national governmental legislation	Yes	Environmental management plan, integrated water use licence and National Environmental Management Act, 1998 (Act 107 of 1998) licences in place and compliant
Tenure	Formal tenure must be demonstrated with reasonable demonstration that a mining right approval can be obtained within the context of local, regional and national governmental legislation	Yes	Tenure is secured. Surface rights secured for majority of current LoM, outstanding surface rights under procurement negotiations, potential land acquisitions for expansions considered and land access obtained for expansion drilling
Infrastructure	Assumptions used should be reasonable and within known/assumed tolerances or have examples of precedence	Yes	Existing infrastructure adequate or can be upgraded with new required infrastructure under construction
Market	Potential market for the product with a reasonable assumption that this market is sustainable	Yes	Primary product qualities suitable for A-grade export market and middlings suitable for domestic power generation

Reserve estimation

Table 18: Reserve estimation

TOPIC	INFORMATION
Software	OCCS
Reserving process	Scheduling of the Reserve is determined using a mining scheduling application (Scheduler) from OCCS, which is the same software used to develop the LoMP schedule. The geological 3D model used for the Resource statement is referred to as the Reserve geological 3D model. The geological model is supplied to mining, project and technology in the form of MinexTM grids. The grids are then imported into a reserving application (Reserver) from the same OCCS software. This application is used to validate the geological information received by checking the integrity of the geological structure, that quality and wash-table values are consistent, and to convert the geological 3D model into mineable block sizes.
Conversion classification	Indicated Resources are generally converted to Probable Reserves and Measured Resources to Proved Reserves after consideration of all applicable modifying factors. If one or more of the modifying factors have not been fulfilled, the Measured Resource is either not converted or the Measured Resource is converted but downgraded to Probable and the associated risk is clearly stated. Inferred Resources are not converted to Coal Reserves.
Inferred Resources inside LoM	Some 0.5Mt of Inferred Resources are included in the LoMP, representing 1.3% of the LoMP, and are not considered material. Inferred Resources, on the western edge of the pit, will only be reached towards the end of LoM.
Modifying factors	
Average thickness cut-off	S2 0.8m, S3 and S4 1.0m
Quality cut-offs	No quality cut-offs, economic cut-offs
Mining loss	0.1m
Boundary pillar	N/A
Dilution	0%
Contamination	0.1m
Mining recovery efficiency	100% (already accounted in mining loss)
Planned average slope angles	90 degrees on hards and on softs (there is a 45m-wide bench between hards and softs as softs are stripped a strip ahead of intended/planned hards face)
Practical plant yield	Considered in the reserving process
Strip ratio cut-off	Considered in the reserving process using the economic model, developed during the exploitation strategy, to get mining boundaries
Environmentally sensitive areas	Distance as per environmental requirements
Legal	Applicable mining right considered
Social	Applicable communities considered
Geohydrological	Applicable surface and groundwater models considered

Ancillary Resource and Reserve information by operation continued

BELFAST continued

Reserve estimation

Table 19: Belfast Coal Resource and Coal Reserve statement

Category	2021 (Mt)	2020 (Mt)	Difference in tonnes (Mt)	Difference (%)	Reason for change
Measured	68.3	71.3	(3.0)	(4)	Reduction of 2.9Mt from mining depletion, 0.4Mt reduction from disposals, 0.1Mt increase from reconciliation linked to 2020 reporting and 0.1Mt increase related to new information in pit 4 and 4B.
Indicated	19.9	19.9	—	—	
Inferred	33.8	34.0	(0.2)	(1)	Mining depletion of 0.1Mt, disposals of 0.2Mt and 0.1Mt increase due to new information.
Total Coal Resources	121.9	125.2	(3.3)	(3)	
Proved	37.5	40.2	(2.7)	(7)	Reduction of 3.1Mt due to mining depletion, 0.2Mt reduction due to model refinement, 0.1Mt disposed, 0.1Mt reduction due to reconciliation linked to 2020 reporting and an increase of 0.7Mt related to new information in pit 4 and 4B.
Probable	2.4	2.1	0.3	14	Increase of 0.2Mt due to new information in pit 4 and 4B, 0.1Mt increase due to downgrade from Proved Reserves relating to graves in pit 1.
Total Coal Reserves	39.9	42.3	(2.4)	(6)	

- *Rounding of figures may cause computational discrepancies.*
- *Tonnages quoted in metric tonnes and million tonnes (Mt). Coal Resources quoted as MTIS.*

Exploration summary

Summary of the exploration for the reporting year is outlined in Table 20. For detailed expenditure, refer to Table 54.

Table 20: Exploration summary

OBJECTIVES	PROGRESS IN REPORTING YEAR	PLANS FOR NEXT REPORTING YEAR
Exploration drilling was undertaken in the BEP area to increase the resolution in geological, metallurgical and geotechnical information of the area.	Forty seven (47) exploration drill holes were drilled mostly utilising TNW with a few selected drill holes using HQ3 to enable coring of unconsolidated material used for delineating the soft and hard OVB split. Four (4) geotechnical drill holes were drilled to determine OVB characteristics that may influence excavation stability during mining. Core samples were prepared for uniaxial compressive testing. Two (2) metallurgical drill holes were twinned using a T6°146 core barrel to obtain sufficient sample mass for drop shatter, dry tumble and wet tumble tests etc.	Ten (10) drill holes are planned to fulfil operational in-fill drilling requirements.

Risks

Table 21: Belfast risks

RISK	DESCRIPTION	MITIGATION
Surface rights	Farms to be purchased to the west of the current mining area (Leeuwbank 427JS portions 9 and 15).	Property valuation conducted on both properties and land management is being negotiated with the surface owners aiming to conclude negotiations during 2022.
Additional farms	Farms to be purchased north of the current LoM (BEP project area) that could potentially extend the LoM.	BEP bankable feasibility study progressing well. Exxaro has reasonable expectation of purchasing the farms within the required timeframe.
Competing tenure applications	A consulting letter for a prospecting right application over various portions of Zoekop.	An objection letter states our submitted mining right.
Encumberments on Reserve	Relocating the last encumberments on the Reserve.	Process of relocation in advanced stages with reasonable expectation that Exxaro will be successful in resolving these encumberments during 2022.
TFR performance	TFR performance was lower than planned.	Potential alternative market offtake will be sourced as a result of poor TFR performance.

Operational excellence

Belfast has a well-entrenched and rigorous operational excellence process. Value chain optimisation is actively driven and progress tracked on a weekly basis to ensure the required optimisation of the mine production value chain is realised through the various operational excellence initiatives.

As part of the Exxaro market-to-resource excellence drive, Belfast transitioned from producing RB1 product during 2020 to producing RB2 product for 2021. With the success achieved during 2021, the product blend for 2022 will remain with RB2 product. The product blend at Belfast is continuously reviewed to further optimise the market-to-resource excellence initiative.

LEEUWPAN

Leeuwpan mine has two opencast pits in operation and multiple face exposure for mining flexibility, which can be linked to the current market-to-resource strategy. The review of the LoM together with low production, due to the market-to-resource strategy, has resulted in eight remaining operational years. Exxaro is currently in a process of potential divestment from the operation.

Leeuwpan overview

Table 22: Leeuwpan overview

RISK	INFORMATION	
Location	10km south-east of the town of Delmas in Mpumalanga, South Africa	
History	**Previous ownership**	**Material notes**
1988 to 2006	Iscor – Iscor mining – Kumba	Exploration began in 1990, first box-cut was commissioned in 1992 and rights ceded to Exxaro in 2006.
2006 to 2021	Exxaro	Infill exploration drilling. Mine in operation for approximately 29 years.
Adjacent properties	Stuart Colliery, Delta Mining Company and HCI Khusela Coal are coal mines owning property in close proximity to Leeuwpan. Silica mine is also adjacent to Leeuwpan.	
Infrastructure	Leeuwpan lies alongside the R50 hard-topped secondary road and is serviced by a rail track that includes a rapid load out station. Electricity is supplied directly to the mine by Eskom by means of a substation at Witklip which is linked to the nearby Eskom power line. Potable water is supplied from drill holes, which are used only for drinking water. Process water is supplied from a closed system, which includes the plant, slimes dams and pit dams. Water replenishment comes from the pits but, if this is insufficient, make-up water from six drill holes is also used.	
Coalfield	Leeuwpan mine is in the Delmas coalfield, on the western border of the Witbank coalfield. The geology within the Delmas coalfield is similar to that of the Witbank coalfield. Like the Witbank coalfield, the Delmas coalfield has up to five coal seams in the middle Ecca group sediments of the Karoo supergroup. The Karoo sequence in the area is represented by the Dwyka formation and the middle Ecca with little or no lower Ecca development. The middle Ecca sequence of coal horizons, interbedded with sediments, is highly truncated due to erosion with only very minor areas where the full sequence is developed. The basement is generally the Malmani dolomites from the Transvaal supergroup. .	
Main seams	Two coal seams have been identified at Leeuwpan: top coal seam and bottom coal seam. The bottom coal seam correlates with the S2 of the Witbank and Highveld coalfields and the top coal seam correlates with the S4 and S5. The bottom coal seam qualities are generally higher than the top coal seam qualities.	
Seam development	The coal seams at Leeuwpan are primarily interbedded with sandstone, shale and carbonaceous shale.	
Depositional control	The coal was deposited on glacial sediments of Dwyka tillite, which in turn was deposited on dolomite of the Transvaal supergroup. A significant amount of magma intruded as concordant sills of dolerite in the Karoo strata in the Delmas area. Associated with the dolerite intrusion are numerous thin dolerite dyke structures that transgress the stratigraphy. Factors controlling geological and quality continuity are mainly surface weathering, significant variation in seam thickness due to an undulating tillite floor, faulting associated with dolerite activity and dolomitic basement, and devolatilisation and weathering due to dolerite intrusions (sills and dykes).	
Resources and Reserves	Coal Resources occur in opencast pits OI, OL and UB, and Reserves occur within the same pits and are aligned with the existing LoMP.	
Mining method	Leeuwpan is an opencast operation with various Reserves, in various pits, mined simultaneously. Current mining operations are on the OIW, OL and OI Reserves. The mine uses trucks and shovels for mining-related operations.	
Beneficiation	Leeuwpan has two dense medium separation plants that beneficiate export thermal coal and two dry plants, crush-and-stack and bypass plants that handle selectively mined thermal coal either for the local market or the export market. The second dense medium separation plant, commissioned in 2016 is operated by Fraser Alexander whereas the original plant is operated by Exxaro.	
Product	Both plants are geared for 5 300kcal/kg production. The crush-and-stack and bypass can produce either 5 300kcal/kg, 4 800kcal/kg or 4 200kcal/kg products.	
Market	Leeuwpan supplies domestic and export markets.	
Mining right	Leeuwpan has an approved mining right that covers 4 269ha.	
Environmental approvals	All environmental appeals have been favourably addressed for the declared Reserves.	
Projects/Feasibility studies	None	

Ancillary Resource and Reserve information by operation continued

LEEUWPAN continued

Leeuwpan overview continued

Figure 9: Leeuwpan mine

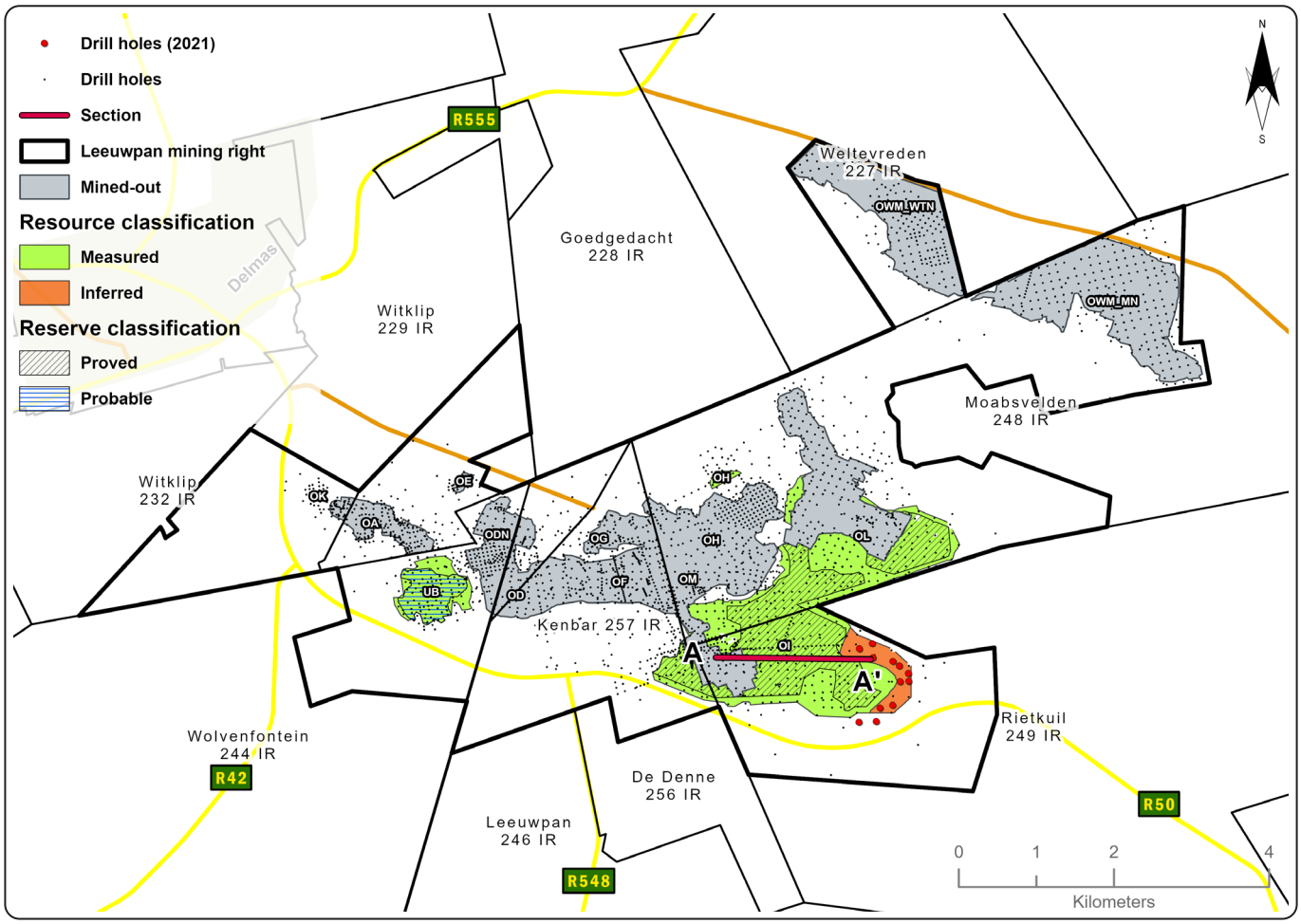
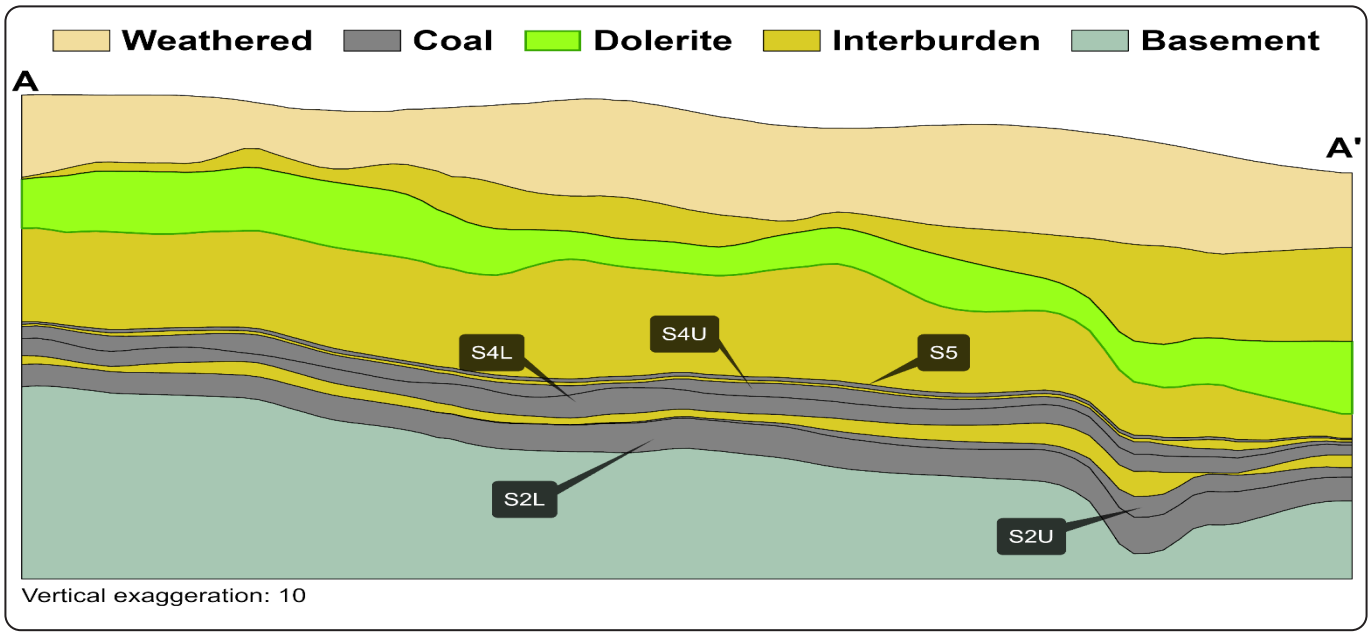


Figure 10: Leeuwpan cross-section through pit OI



Resource estimation

Table 23: Resource estimation methodology and reporting

PROCESS	INFORMATION
Drilling, logging and sampling	Vertical surface drill holes are drilled and subsequently logged on site. Lithological codes are used when capturing the lithology. Photographs of the core are taken after marking the core. Samples are split on the lithological contact, if needed, using a chisel and hammer to ensure a clean break. Each sample is put in an individual bag with all material represented in that interval, ensuring no contamination occurs between materials to be sampled. Two sample tags are marked using a permanent marker. One sample tag is placed inside the bag and the second on the outside of the bag then sealed with a cable tie.
Laboratory and accreditation	SGS, SANAS T0561
Laboratory dispatch and receiving process	All samples collected and bagged are registered in a sample sheet, which is also used as a dispatch sheet. The dispatch sheet is signed by the receiving laboratory personnel after ensuring that the number and sample ID on the dispatch sheet matches that of the actual samples to be analysed. Once the laboratory receives and signs the dispatch sheet, it is responsible for safekeeping and storage of that batch of samples.
Laboratory quality control and quality assurance	SGS is accredited for analytical work and participates in monthly local and international round robins.
Data datum	Cape datum – LO29
Drill hole database	acQuire
Number of drill holes in mining right	2 993
Number of drill holes used for Resource estimation	612
Number of drill holes used for classification	492
Data compositing and weighting	acQuire
Data validation	Conducted using queries in acQuire and Excel
Geological modelling software	Geovia Minex™
Estimation technique	Growth algorithm
Previous model date	2018
Last model update	2019
Grid mesh size	20m x 20m
Scan distance	1 000m
Data boundary	200m
Model build limits	Upper: limit of weathering and topography/collar Lower: basement/Dwyka
Model outputs	Roof, floor and thickness grids generated for structure Raw and wash quality grids
Changes to modelling process	None
Thickness cut-off and extraction height considerations	2019 model ≤0.5m (S5 ≤1m)
Quality cut-offs (adb)	Ash ≥50%, a non-material amount of coal ≥50% ash may be included to ensure optimised extraction
Geological loss applied	5% to 100% based on geological loss domains (5% standard geological loss is applied but may vary based on the consideration of structural complexity (dolerite sill breakthrough – 50% loss within determined spatial extent and fault displacement zone – 100%) and seam floor adulation (10% loss).

Ancillary Resource and Reserve information by operation continued

LEEUWPAN continued

Resource estimation continued

Table 24: Resource classification criteria

CATEGORY	TYPE OF DRILL HOLES	DRILL HOLE SPACING	STRUCTURALLY COMPLEX AREAS	DRILL HOLES/HA
Measured	Cored drill holes with applicable coal qualities	0m to 100m	May be more conservative after consideration of RODA	1.1
Indicated	Cored drill holes with applicable coal qualities	100m to 200m	May be more conservative after consideration of RODA	0.6
Inferred	Cored drill holes with applicable coal qualities	200m to 1 000m	May be more conservative after consideration of RODA	0.2

Table 25: RPEEE considerations

ITEM	CRITERIA	CRITERIA MET	COMMENT
Geological data	Data has been validated and signed off by Competent Person	Yes	Seam depth, seam thickness ≤0.5m all seams except S5 thickness ≤1m, ≥50% ash content but a non-material amount of coal with ≥50% ash may be included to ensure optimised extraction, coal qualities are reported on an air-dried basis
Geological model	Geological model has been considered and signed off	Yes	2019
Structural model	Structural model was considered and signed off	Yes	2019
Mining	Mining assumptions considered and defined	Yes	Opencast
Assurance	Exxaro internal audits and external audit conducted	Yes	External audit by EY in 2021
Economic evaluation	Exploitation study with economic and mining assumptions, including geotechnical and geohydrological assumptions	Yes	LoM exploitation study
Environmental	Reasonable demonstration that environmental approvals can be obtained within the context of local, regional and national governmental legislation	Yes	Current required approvals in place
Tenure	Formal tenure must be demonstrated with reasonable demonstration that a mining right approval can be obtained within the context of local, regional and national governmental legislation	Yes	Mining right valid to 2039 with no impediments noted
Infrastructure	Assumptions used should be reasonable and within known/assumed tolerances or have examples of precedence	Yes	Current infrastructure
Market	A potential market for the product with a reasonable assumption that this market is sustainable	Yes	Current market

Reserve estimation

Table 26: Reserve estimation

TOPIC	INFORMATION
Software	OCCS
Reserving process	Scheduling of the Reserve is determined using a mine scheduling application (Scheduler) from OCCS, which is the same software used to develop the LoMP schedule. The geological three-dimensional (3D) model used for the Resource statement is referred to as the Reserve geological 3D model. The geological model is supplied to mining, projects and technology in the form of MinexTM grids. The grids are then imported into a reserving application (Reserver) from the same OCCS software. This application is used to validate the geological information received by checking the integrity of the geological structure and that quality and wash-table values are consistent, and to convert the geological 3D model into mineable block sizes. Careful product selection and balancing of remaining reserves is required at Leeuwpan to ensure maximum value for Exxaro.
Conversion classification	Indicated Resources are generally converted to Probable Reserves and Measured Resources to Proved Reserves after consideration of all applicable modifying factors. If one or more of the modifying factors have not been fulfilled, Measured Resource is either not converted or the Measured Resource is converted but downgraded to Probable and the associated risk is clearly stated. This is the case for UB, where it is classified as a Probable Reserve because of additional modifying factors such as low volatiles and the limited market for this particular quality of coal. Inferred Resources are not converted to Coal Reserves.
Inferred Resources inside LoM	No Inferred Resources inside LoM.
Modifying factors	
Average thickness cut-off	0.5m all seams except S5, which is 1.0m
Quality cut-offs	N/A
Mining loss	25% for S5 and 5% for all other seams
Boundary pillar	100m
Dilution	0%
Contamination	5% on dense medium separation plants and 1% on crush and stack plant
Mining recovery efficiency	5% (crush and stack) and 5% (dense medium separation bypass)
Planned average slope angles	45 degrees. For highwall stability, soft material is mined at least one strip ahead of hard material and coal mining activities
Practical plant yield	90% dense media separation and 90% Fraser Alexander dense medium separation with slimes loss on dense media separation of 9% and 15% on Fraser Alexander dense media separation.
Strip ratio cut-off	Strip ratio is determined using the energy strip ratio assessment and is considered in the reserving process using the economic model to get mining boundaries
Environmentally sensitive areas	Environmentally sensitive areas applications made, and approval acquired before mining.
Legal	Applicable mining right considered
Social	Applicable communities considered. Socially sensitive areas in the mining right (such as graveyards) are excluded from Reserves in the reserving process
Geohydrological	Applicable surface and groundwater models are considered. The pit floor was taken into consideration to minimise water handling in the pit face

Ancillary Resource and Reserve information by operation continued

LEEUWPAN continued

Reserve estimation continued

Table 27: Leeuwpan Coal Resource and Coal Reserve statement

Category	2021 (Mt)	2020 (Mt)	Difference in tonnes (Mt)	Difference (%)	Reason for change
Measured	77.9	79.9	(2.0)	(2)	Reduction by 4.6Mt due to mining depletion and increase of 2.6Mt due to Resource conversion from the Indicated category.
Indicated	0.0	2.6	(2.6)	(100)	Resource conversion to Measured category due to increased Resource confidence.
Inferred	3.6	3.6	—	—	
Total Coal Resources	81.5	86.1	(4.6)	(5)	
Proved	40.2	42.0	(1.8)	(4)	Reduction by 4.5Mt due to mining depletion, 2.5Mt increase due to Reserve reclassification from Probable, 1.3Mt increase due to model refinement, 0.4Mt reduction due to methodology and 0.7Mt reduction due to reconciliation relating to 2020 reporting.
Probable	3.2	5.7	(2.5)	(44)	Reduction by 2.5Mt is due to a change in the Resource classification to Measured.
Total Coal Reserves	43.4	47.8	(4.3)	(9)	

- *Rounding of figures may cause computational discrepancies.*
- *Tonnages quoted in metric tonnes and million tonnes (Mt). Coal Resources quoted as MTIS.*

Exploration summary

Summary of the exploration for the reporting year is outlined in Table 28. For detailed expenditure, refer to Table 54.

Table 28: Leeuwpan exploration summary

OBJECTIVES	PROGRESS IN REPORTING YEAR	PLANS FOR NEXT REPORTING YEAR
Increase Resource confidence from Inferred Resource to Measured Resource in the OI area	Twelve (12) surface vertical drill holes were drilled using conventional diamond drilling. TWN core was recovered, logged and sampled. The spacing of the drill holes was such that in the next geological model update the area's geological classification will be converted to Measured category. All the drill holes were wireline logged.	Ten (10) drill holes are planned, mainly in the OL extension, to delineate the sandstone washout zone and increase confidence in the OL-OI Bridge area.

Risks

Table 29: Leeuwpan risks

RISK	DESCRIPTION	MITIGATION
Dolerite sill impact on slope stability	Reserve blocks UB and OI have a dolerite sill overlying the coal strata and the sill orientation affects slope stability.	Apply RODA to identify the areas of high geological risk. The bench design is modified based on dolerite dipping towards the seam.
Major faults	Major faults with displacements greater than the seam widths occur between OL and OI. This is also associated with sill transgression.	Inclusion in the RODA plan and higher geological losses applied to major fault zones.
Coal quality	In seam quality deviations are generally localised and are associated with minor channel washouts.	Manage quality variability through grade control practices.
Water accumulation	In-pit water accumulation due to excess groundwater either from the pit face or with coal exposure.	Proactive groundwater management and pit dewatering.
Reserve losses	In OI West, along the R50, the rock engineering design requires that a safe stand-off distance is established to prevent potential slope failure and infrastructure damage (Eskom power line and national road).	Geotechnical design has been done to establish safe benching practice. Application process in progress to allow mining within 100m of power line and national road.

Operational excellence

Operational excellence at Leeuwpan exists to focus on the continual sustainable improvement of core processes in the value chain using principles such as performance benchmarking, waste reduction, theory of constraints, productivity improvement, and new technologies on the existing processes, people and systems. The value-driven focus at Leeuwpan is on the top five initiatives, Lean 5 compliance and Digital@ Exxaro innovation. The key focus remains on mining operations, plant processing and engineering to assist in improving throughput, cost reduction and safety compliance for the benefit of the entire mine value chain.

MATLA

Matla is a captive underground coal mine that extracts thermal coal that is crushed, screened and sized before it is delivered directly to the Eskom-owned Matla power station via a network of conveyor belts. There is potential to increase RoM through successfully implementing and executing the three major expansion projects that are at various stages of implementation. A major milestone was reached in 2021 for the Mine 1 relocation project through the completion of the boxcut. Through the review of the LoM and innovation from the Matla team, investigations on additional mining ground are ongoing.

Matla overview

Table 30: Matla overview

TOPIC	INFORMATION	
Location	15km west of the town of Kriel in Mpumalanga, South Africa	
History	**Previous ownership**	**Material notes**
1976 to 1990	Trans Natal Mines	Construction began in 1976 with full production in 1983
1990 to 2006	Eyesizwe	Rights ceded to Exxaro in 2006
2006 to 2021	Exxaro	Continuous exploration drilling. Mine in operation for approximately 38 years.
Adjacent properties	The well-known Kriel coal mine neighbours Matla mine to the east and the operations of Khutala (South32) and Zondagsfontein (Anglo American) to the north.	
Infrastructure	Matla is on the P53-1 and R547 secondary roads branching off the R580 and R545. Existing infrastructure of the three shaft complexes includes three ventilation shafts, a network of conveyor belts, coal silos and stockpiles, a crushing and screening plant, four pollution-control dams, hospital, accommodation facilities, offices, workshops, and a water treatment plant. Potable water is received from Eskom and no potable water plant exists on the mine property. Electricity is sourced from Eskom (Matla power station) and transporting coal from the mine to Matla power station is via a network of conveyor belts.	
Coalfield	Matla mine is in the Highveld coalfield, immediately south of the Witbank coalfield. The coal seams are found in the Vryheid Formation of the Karoo supergroup. The stratigraphy sequence in the Matla area includes five coal seams that can be easily correlated with seams found in the Witbank coalfield.	
Main seams	The principal economic seams currently exploited are S2 and S4 with mining of S5 terminated in 1998 due to high levels of contamination and subsequent increase in abrasive index.	
Seam development	Coal seams in the area are generally flat and continuous with subsequent igneous activity resulting in displacements and devolatilisation of coal seams at places. The 5 seam is most prominent in the Mine 2 and Mine 3 areas and, to a limited extent, in the western limb of the southern part of the mining right area. The roof comprises approximately 0.5m of thick sandy micaceous shale at Mine 2 that thickens up to approximately 1.6m in Mine 3. The seam consists of mixed coal and torbanitic material with an average thickness of 1.5m. Economic S4 exists in the Mine 1, Mine 2 and Southern Reserve areas, and to a limited extent in the Mine 3 area. At Mine 3, the seam splits into two thin, poor-quality horizons towards the west, and is thus excluded from the mineable reserves. The best quality S4 may be found at Mine 1 and at the eastern edges of Mine 2. The seam is composed of dull lustrous coal interspersed with bright coal bands. In-seam partings typically consist of discontinuous lenses of shales and siltstones less than 0.1m thick but these may thicken locally to 0.3m. Carbonaceous limestone lenses are also prevalent within the central portion of the Mine 2 area. The S2 at Matla is well developed in the north-western part of the mining area in the mines 2 and 3 Resource areas. It thins out to the south, where thickness averages at 1.2m to 2.5m. Much of the coal in this area is mined as a low seam. Much of the S2 is burnt by a prominent dolerite sill between the Mine 2 and Mine 1 as well as in the western and south-eastern portions. Coal qualities are also generally poor in this area thus S2 is not generally mined in the southern portion of the mine area.	
Depositional control	The coal was deposited on glacial sediments of Dwyka tillite, which in turn was deposited over a granitic basement. The Matla mining area is characterised by two distinct dolerite types, the B8 (porphyritic) and B4 (olive-rich) types which have varying effects on seam displacements and coal burning and devolatilisation. A dolerite sill with an average thickness of 10m is generally found above S5 in mines 2 and 3. However, the sill intersects the coal seams and underlies S2 in Mine 1 and S4 on the south-western part of the Reserves. This sill has burned and devolatilised S2 on the southern part of the mining area in Mine 1. Floor rolls have been encountered in S2 workings and created some challenges in some mining sections. The floor rolls strike north-east-south-west, vary in width between 50m and 200m and have amplitudes up to 1.5m. The floor rolls are more prominent if the seam floor is close to the basement contact. Sandstone lenses encountered are generally less than 0.5m in width but can reach up to 1.5m in thickness.	
Resources and Reserves	Coal Resources and Reserves occur within the domains of mines 1, 2 and 3. The Coal Reserves are aligned with the existing LoMP.	
Mining method	Matla comprises three underground production facilities: Mine 1, Mine 2 and Mine 3. All three are long-life assets, each with a specific operating capacity comprising conventional coal circuits to produce bituminous coal. Work at Mine 1 was stopped in 2015 due to pillar instability but an Eskom-approved project to relocate Mine 1 access is currently in the implementation phase. Mine 2 and Mine 3 use bord-and-pillar and shortwall methods to mine S2 and S4 coal seams.	

Ancillary Resource and Reserve information by operation continued

MATLA continued

Matla overview continued

Table 30: Matla overview continued

TOPIC	INFORMATION
Beneficiation	None of the coal mined at Matla is beneficiated but is crushed and screened (sized) before being conveyed to the power station.
Product	Matla mine produces thermal coal exclusively for Eskom.
Market	Captive market: Eskom
Mining right	Matla has an approved mining right that covers some 23 494ha.
Environmental approvals	All environmental appeals have been favourably addressed for the declared Reserves except for one that has expired but is under renewal.
Projects/Feasibility studies	Three major LoM projects exist at Matla, namely the Matla Mine 1 relocation project (MM1R), the Northwest Access Decline project (NWA decline) and the Northwest Access Incline project (NWA incline). The MM1R is currently in progress and includes the construction of a boxcut, portals, silos and overland conveyors which creates a new access point to Mine 1, with conveyor infrastructure transporting the coal directly to Matla Power Station. The NWA projects are two separate projects where a decline and incline will be constructed at Mine 3 and Mine 2 respectively to unlock future Coal Reserves. The NWA incline is currently in progress where the incline connects existing Seam 2 workings to the 4 Seam to allow extraction of the 4 Seam through Mine 2.

Figure 11: Matla mine

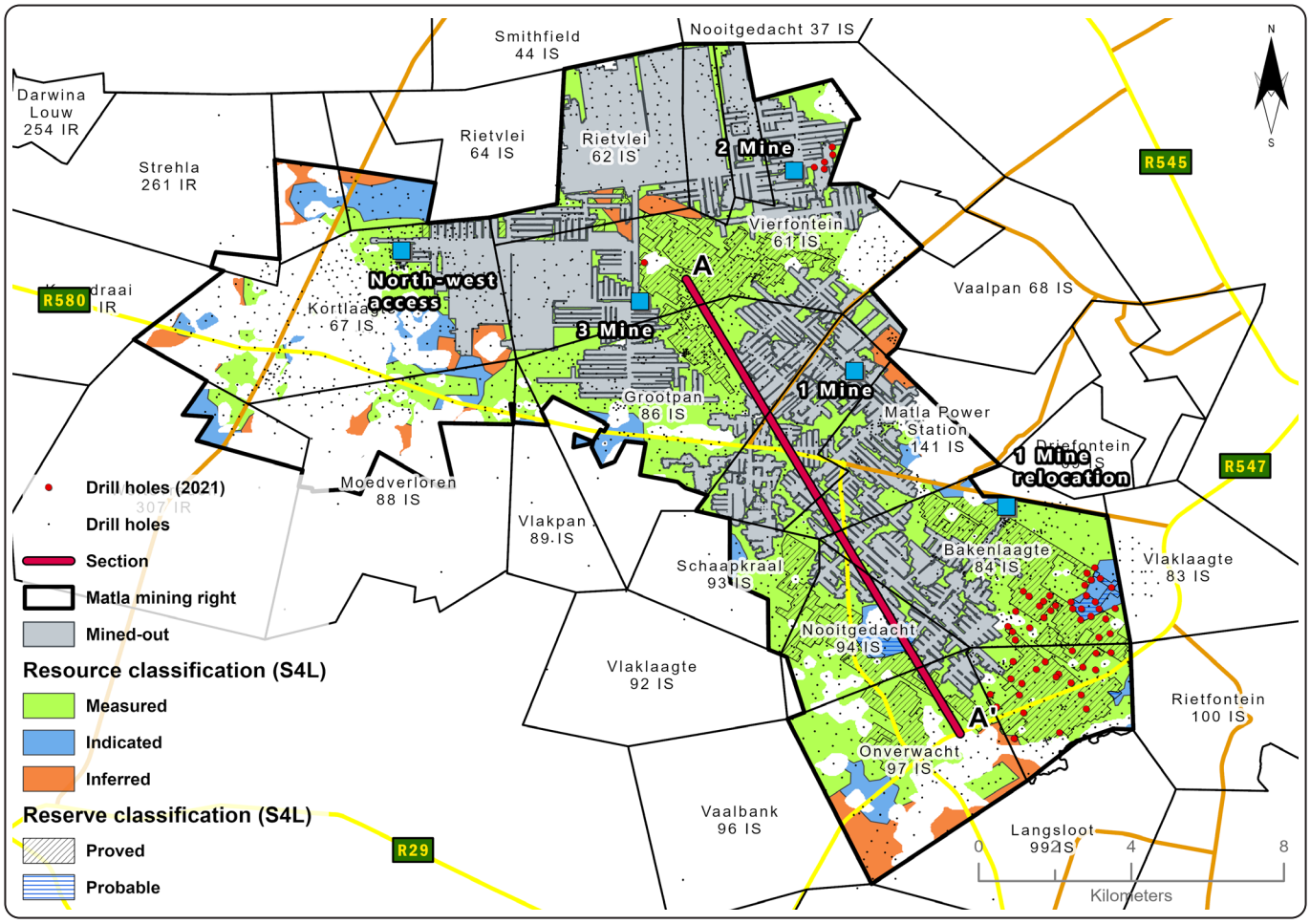
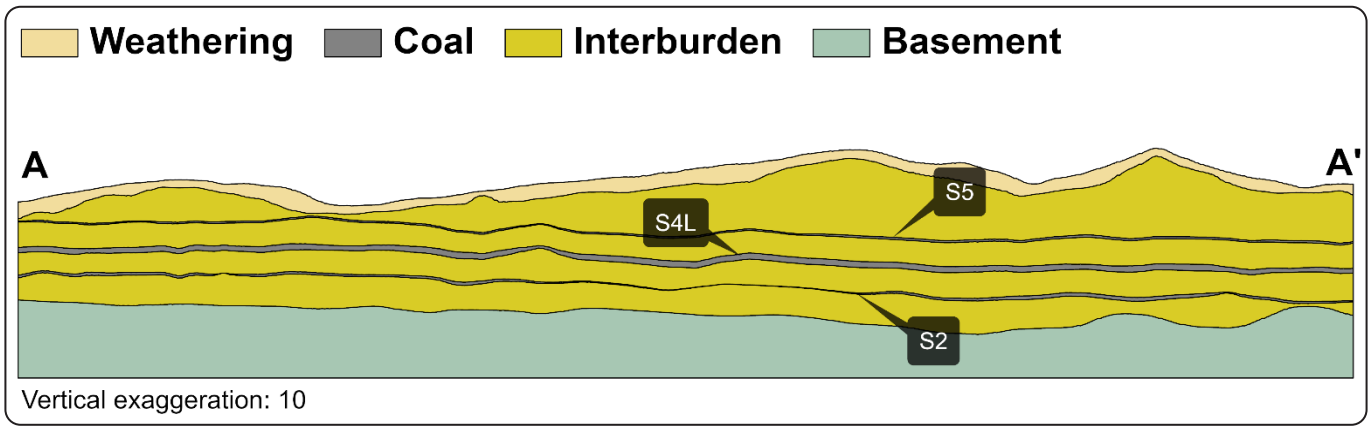


Figure 12: Matla cross-section



Resource estimation

Table 31: Resource estimation methodology and reporting

PROCESS	INFORMATION
Drilling, logging and sampling	Surface vertical, surface inclined and underground horizontal drilling methods are employed at Matla. Of these, only the vertical surface drill holes are used for resource modelling. All drill holes are geologically logged on a detailed log sheet with the content dictated by the Exxaro logging procedure. Logging is conducted by recording of lithology down to 1cm detail on logging sheets, according to the classification of the lithology. Once all core and sample markings are in place, the core is photographed on a 1m interval basis. Once correlated, sample intervals are defined based on lithological contacts and logical boundaries along the drill hole, across the named intervals or seams. If the entire unit is homogenous samples are then collected at 1.5m intervals. All samples are placed into plastic sample bags, and a sample tag is placed inside the bag, with a duplicated attached to a cable tie on the bag's exterior. The sample tags are used to identify the samples according to a sampling convention, which is recorded in the log sheet and geological database as to allow the laboratory results to be assigned to the correct interval in each specific drill hole.
Laboratory and accreditation	Siza Coal laboratory, SANAS T0447
Laboratory dispatch and receiving process	All samples collected and bagged are registered in a sample sheet which is also used as a dispatch sheet. All exploration samples are weighed on site prior to dispatch and recorded at the mine. The laboratory reports the weight of each individual sample, and these results are compared to the mine weights to validate that the correct samples were conveyed correctly and safely to the laboratory. The dispatch sheet is signed by the receiving laboratory personnel after ensuring that the number and sample ID on the dispatch sheet matches that of the actual samples that should be analysed. The analyses required are also clearly explained in the sample dispatch sheet.
Laboratory quality control and quality assurance	Matla conducted QA/QC on Siza laboratory processes and equipment in 2020. Siza laboratory also does internal validations and checks as part of their QA/QC programme. Siza partakes in round robins.
Data datum	Cape datum – LO29
Drill hole database	acQuire
Number of drill holes in mining right	3 321
Number of drill holes used for Resource estimation	S2 – 2 523 S4 – 2 222
Number of drill holes used for classification	S2 – 1 659 S4 – 2 116
Data compositing and weighting	Conducted in Geovia Minex™
Data validation	Conducted using queries in acQuire and Excel
Geological modelling software	Geovia Minex™

Ancillary Resource and Reserve information by operation continued

MATLA continued

Resource estimation continued

Table 31: Resource estimation methodology and reporting continued

PROCESS	INFORMATION
Estimation technique	Growth algorithm
Previous model date	2019
Last model update	2020
Grid mesh size	25m x 25m
Scan distance	2 000m
Data boundary	200m
Model build limits	Upper: limit of weathering and topography/collar Lower: basement/Dwyka
Model outputs	Roof, floor and thickness grids generated for structure Raw quality grids
Changes to modelling process	None
Thickness cut-off and extraction height considerations	≤1.8m and ≥4.8m
Quality cut-offs (adb)	DAFV ≤26% CV ≤15MJ/kg, Ash ≥50%
Geological loss applied	10% (may vary considering RODA)

Table 32: Resource classification criteria

CATEGORY	TYPE OF DRILL HOLES	DRILL HOLE SPACING	STRUCTURALLY COMPLEX AREAS	DRILL HOLES/HA
Measured	Cored drill holes with applicable coal qualities	0m to 350m	Infill drilling is conducted where basement highs and or seam structure creates uncertainty around continuity.	S4 – 0.2 S2 – 0.1
Indicated	Cored drill holes with applicable coal qualities	350m to 500m	Infill drilling is conducted where basement highs and or seam structure creates uncertainty around continuity.	S4 – 0.1 S2 – 0.1
Inferred	Cored drill holes with applicable coal qualities	500m to 1 000m	Infill drilling is conducted where basement highs and or seam structure creates uncertainty around continuity.	S4 – 0.1 S2 – 0.4

Table 33: RPEEE considerations

ITEM	CRITERIA	CRITERIA MET	COMMENT
Geological data	Data has been validated and signed off by Competent Person	Yes	Seam depth ≤40m, seam thickness ≤1.8m and ≥4.8m, dry ash-free volatiles ≤26%, air-dried CV≤19.5MJ/kg and ash ≥50% with coal qualities reported on an air-dried basis.
Geological model	Geological model has been considered and signed off	Yes	2020
Structural model	Structural model was considered and signed off	Yes	2020
Mining	Mining assumptions considered and defined	Yes	Underground
Assurance	Exxaro internal audits and external audit conducted	Yes	2019 (model and chain of custody)
Economic evaluation	Exploitation study with economic and mining assumptions, including geotechnical and geohydrological assumptions	Yes	LoM exploitation study

Table 33: RPEEE considerations *continued*

ITEM	CRITERIA	CRITERIA MET	COMMENT
Environmental	Reasonable demonstration that environmental approvals can be obtained within the context of local, regional and national governmental legislation	Yes	Current required approvals in place or there is reasonable expectation that outstanding approvals will be granted. Additional requirements can be demonstrated in the context of local, regional and national legislation. Land acquisitions for future stooping can be achieved based on the current acquisition strategy.
Tenure	Formal tenure must be demonstrated with reasonable demonstration that a mining right approval can be obtained within the context of local, regional and national governmental legislation	Yes	The mining right expires in 2025. Application to renew is in process and there is reasonable expectation that it will be extended with no impediments noted.
Infrastructure	Assumptions used should be reasonable and within known/assumed tolerances or have examples of precedence	Yes	Current infrastructure.
Market	A potential market for the product with a reasonable assumption that this market is sustainable	Yes	Current coal supply agreement (CSA) in place until 2023. Negotiations to renew are in process. Exxaro has reasonable that the CSA will be renewed.

Reserve estimation

Table 34: Reserve estimation

TOPIC	INFORMATION
Software	XPAC
Reserving process	Scheduling of the Coal Reserve is determined using mine scheduling applications from XPAC and ProgCad. The geological 3D model used for the Coal Reserve estimation is referred to as the Reserve 3D model. The Coal Resource model uses the full coal seam while the Reserve model only defines a select mining height. The process ensures the model represents reality regarding the technical capability of current production equipment. Resources are converted to Reserves where the Resource confidence, continuity and other factors (including economic, environmental, safety and social aspects) allow for the reasonable expectation of successful extraction. Reserves are converted using modifying factors which account for layout design and associated losses. The Reserves stated are subject to verification according to an approved fact pack, which sets out the standards and considerations for all reserving and scheduling processes. This document is reviewed annually and vetted by all relevant stakeholders.
Conversion classification	At Matla, Indicated Resources are generally converted to Probable Reserves and Measured Resources to the Proved Reserve category, except if any modifying factors have not been (partly) fulfilled, where the Resource is either not converted or downgraded to the Probable Reserve category, clearly stating the outstanding requirement and risk.
Inferred Resources inside LoM	Some 7.6Mt of Inferred Resources are included in the LoMP, representing 4.7% of the LoMP, and are not considered material.

Ancillary Resource and Reserve information by operation continued

MATLA continued

Reserve estimation continued

Table 34: Reserve estimation continued

TOPIC	INFORMATION
Modifying factors	
Average thickness cut-off	≤1.8m and ≥4.8m
Quality cut-offs	DAFV ≤26% and CV ≤19.5MJ/kg
Mining loss	Already included in model, based on specific geological conditions and mining restrictions
Depth to roof	40m unless rock strength allows otherwise
Safety factor	Tertiary panels 1.6 and main development 2.0
Bord width	7.2m
Barrier pillar	At least equal to pillar width
Pillar centres	19m x 19m or depending on depth and safety factor
Boundary pillar	15m
Mining height	≤1.8m and ≥4.8m
Extraction factor	Already included in model
Dilution	Already included in model
Contamination	Use select seam
Practical plant yield	N/A
Strip ratio cut-off	N/A
Environmentally sensitive areas	Areas underlying wetlands and other eco-sensitive areas are excluded from Reserves. A higher safety factor is used underneath rivers and surface structures.
Legal	Applicable mining right considered
Social	Applicable communities considered
Geohydrological	Applicable surface and groundwater models considered.

Table 35: Matla Coal Resource and Coal Reserve statement

Category	2021 (Mt)	2020 (Mt)	Difference in tonnes (Mt)	Difference (%)	Reason for change
Measured	639	694	(55)	(8)	Reduction of 8Mt through depletion and 47Mt reduction due to the removal of isolated remnant coal blocks that did not meet the RPEEE criteria.
Indicated	114	123	(9)	(7)	Reduction of 1Mt through depletion and 9Mt reduction due to the removal of isolated remnant coal blocks that did not meet the RPEEE criteria.
Inferred	93	151	(58)	(38)	Reduction of 2Mt through depletion and 55Mt reduction due to the removal of isolated remnant coal blocks that did not meet the RPEEE criteria.
Total Coal Resources	847	968	(122)	(13)	
Proved	124	148	(24)	(16)	Mining depletion 5Mt, 4Mt reduction due to LoMP changes relating to areas of burnt coal and 15Mt downgraded to Probable Reserve due to surface land ownership required for stooping.
Probable	38	22	16	74	Mining depletion 1Mt and 2Mt increase due to LoMP changes related to new information and the remainder is due to reclassification from Proved Reserves.
Total Coal Reserves	162	169	(7)	(4)	

- *Rounding of figures may cause computational discrepancies.*
- *Tonnages quoted in metric tonnes and million tonnes (Mt). Coal Resources quoted as MTIS.*

Exploration summary

Summary of the exploration for the reporting year can be seen in Table 36. For detailed expenditure, please refer to Table 54.

Table 36: Matla exploration summary

OBJECTIVES	PROGRESS IN REPORTING YEAR	PLANS FOR NEXT REPORTING YEAR
Increase geological confidence in S2L Mine 3 area	Surface directional drilling was conducted in the main development access of the planned low seam LoM to ascertain dyke behaviour and coal continuity.	Areas with dykes and fractured coal zones, which were identified through directional drilling, will be targeted in the 2022 vertical exploration campaign.
Infill drilling in planned future mining areas of Mine 2 and Mine 3 (S2 western resource)	Infill drilling was conducted at Mine 2 Eastern Reserves to confirm coal continuity and quality.	Further drilling is planned for the Mine 2 Eastern Reserves as well as the Mine 3 S4 medium-term mine plan.
Mine 2 S4 project area dolerite definition and displacement delineation	Surface directional drilling was conducted in 2020, which was used to redefine the mine design for the 2021 reporting year.	No drilling is planned in this area for 2022.

Risks

Table 37: Matla risks

RISK	DESCRIPTION	MITIGATION
Eskom purchasing of surface farms to commence with stooping	Require ownership of farms where stooping is planned.	Eskom to purchase surface ownership of a list of farms as per CSA.
Environmental authorisation for stooping	The environmental management plan for total extraction on stooping can only start if the surface land belongs to Eskom.	Eskom needs to purchase ownership of a list of farms as per CSA.
Geological structures	Geological faulting as well as the impact of sill and dykes are very pertinent challenges in all three of the Matla mine expansion projects. Unforeseen geological structural complexity (faulting and intrusives) poses risk for specifically the low seam Reserves at mines 2 and 3. Geological faults with a significant offset have been encountered and they have production tempo impacts in the mining sections.	The challenges are addressed through a suite of exploration activities. Challenges are proactively accommodated in mine planning. Continuous surface exploration drilling aims to improve sill characterisation in Mine 2 while underground horizontal drilling is used to pinpoint dykes in operating sections at mines 2 and 3.
Limited pit room due to project execution delays	Approximately 83% of the current Reserves are within the expansion projects. Delays in funding or execution may delay access to Reserves.	Continuous investigations on accessing new mining areas that were previously excluded from the LoM either due to quality, structural complexity or geological confidence.

Operational excellence

Due to the structural complexity at Matla, surface to seam directional drilling was implemented as an investigative tool to detect structures that affect mining operations. The success of detecting structures, using this tool, has assisted in redefining LoM in the affected areas. It has also enabled targeted vertical exploration drilling thus restricting drilling to areas of interest.

Mining ground availability has become a key focus area at Matla due to delays in three major LoM projects. Over the past three to four years, additional Reserves have been unlocked at Mine 3 Seam 4, Mine 2 Seam 2 and Mine 3 Seam 2 mining areas to ensure continued production while project implementation is ongoing. These additional Reserves have included the delineation of low seam coal at Mine 3, as well as shortwall mining at Mine 2 with the aim of increasing production tonnes from the mine, in conditions never attempted anywhere in the world.

Ancillary Resource and Reserve information by operation continued

GROOTEGELUK

Grootegeluk Mine is a large multi-seam, multi-product surface coal mining operation that had been in operation since 1980. Grootegeluk has a long-term CSA with Eskom. The RoM is hauled to five tipping areas, which in turn feeds eight different beneficiation plants. The largest portion of the beneficiated product is power station coal, which is continuously dispatched to the Matimba and Medupi power stations via a conveyor belt system. Several sized metallurgical coal products, semi-soft coking coal as well as steam coal are railed to various customers and shipped to international clients. A small portion of the total product is sold on site to smaller customers and dispatched by road.

Grootegeluk overview

Table 38: Grootegeluk overview

TOPIC	INFORMATION	
Location	25km west of the town of Lephalale in Limpopo, South Africa	
History **1960s to 1980** **1980 to present**	Previous ownership Yskor – Iscor – Iscor mining – Kumba Kumba – Kumba coal – Exxaro Resources	Material notes Exploration drilling Mine commissioned in 1980, continuous exploration drilling to increase Resource confidence. Mine in operation approximately 41 years.
Adjacent properties	Thabametsi to the west	
Infrastructure	Grootegeluk can be reached from Lephalale via the hard-topped Nelson Mandela Drive, which is linked to the R510 road connecting Lephalale to the town of Vaalwater to the south and the Stockpoort border post between South Africa and Botswana to the north. Power supply to the mine is obtained directly from the power station via two 132kV lines that supply the mine's three 840MVA transformers. Raw water is delivered to the mine and to a water-treatment plant on the farm Zeeland by the 700mm-diameter Hans Strijdom pipeline. The pipeline originates at the Mokolo Dam. Potable water from the Zeeland water-treatment plant is in turn routed to the mine and local communities.	
Coalfield	Grootegeluk is located in the Waterberg coalfield and the coal seams are from the Volkrust and Vryheid formations.	
Main seams	The upper part of the coal deposit, the Volksrust Formation (approximately 60m thick) is classified as a thick interbedded seam deposit type, comprising intercalated mudstone or carbonaceous shale and bright coal layers. The Vryheid Formation (approximately 55m thick) forms the lower part of the coal deposit and comprises carbonaceous shale and sandstone with interbedded dull coal seams varying in thickness from 1.5m to 9m. It is therefore classified as a multiple-seam deposit type.	
Seam development	These coal seams are subdivided into 11 coal zones which are further divided into separate coal and non-coal samples for analysis. A total of 77 samples are analysed per full succession drill hole consisting of 30 coal samples and 30 non-coal samples for the Volksrust Formation and 13 coal samples and four non-coal samples for the Vryheid Formation.	
Depositional control	The Zoetfontein fault forms the boundary of the Waterberg coalfield in the north while the Eenzaamheid fault forms the boundary in the south. The Daarby fault, with a throw of some 350m, divides the coalfield into a deep north-eastern portion and a shallow south-western portion. The first fresh coal in the shallow south-western portion is on average 20m below surface. The lowermost coal seam (Zone 1) occurs at a depth of about 130m in the shallow portion of the coalfield but this may vary depending on the local structure. The predominantly horizontal coal-bearing formations have a very gentle dip to the south-east near Grootegeluk. Only a few dolerite dykes outcrop in the south-eastern portion of the Waterberg coalfield and no sills have been encountered in any exploration drill holes drilled in the mine right area to date.	
Resources and Reserves	The Resource extent is restricted by the depositional controls discussed above. The Reserves are restricted within the Resource blocks.	
Mining method	Grootegeluk comprises of one open-pit mine, which includes two overburden benches, nine RoM benches and three interburden benches. A series of parallel benches are advanced progressively across the deposit via a process of drilling, blasting, loading and hauling with truck-and-shovel fleets. RoM is transported to the Grootegeluk beneficiation complex via haul trucks and in-pit crushing and conveying systems.	
Beneficiation	Coal is beneficiated via eight different plants that produce power station coal (thermal coal) at 35% ash, variously sized metallurgical coal products at different quality specifications and semi-soft coking coal.	
Product	Various sized metallurgical coal products at 15% ash and 11.25% ash, semi-soft coking coal at 10.3% ash, as well as steam coal at 12.5% ash are railed to various customers and shipped to international clients via an export harbour. A small portion of the total product is sold on site to smaller customers and dispatched by road.	

Table 38: Grootegeluk overview continued

TOPIC	INFORMATION
Market	Local and export market.
Mining right	Grootegeluk has an approved mining right that covers some 26 325ha.
Environmental approvals	All environmental appeals have been favourably addressed for the declared Reserves.
Projects/Feasibility studies	The GGAMS project specifically refers to different methods of extracting, transporting, handling and placement of the OVB material at Grootegeluk mine by shifting it from the front of the advancing pit face to other destinations, especially the backfill area within the mined-out void of the pit.

Figure 13: Grootegeluk mine

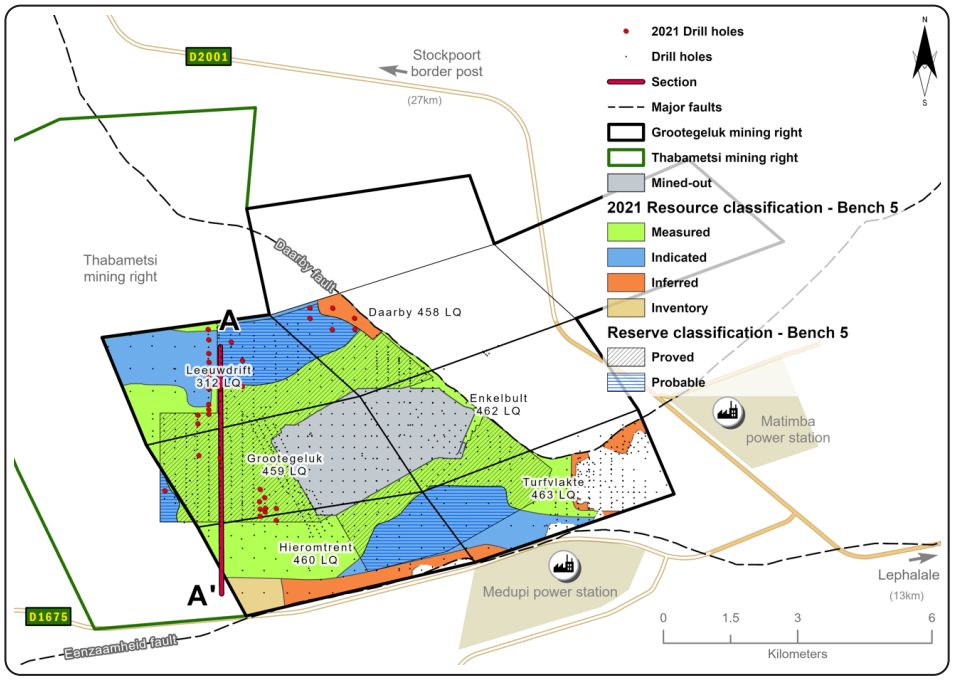
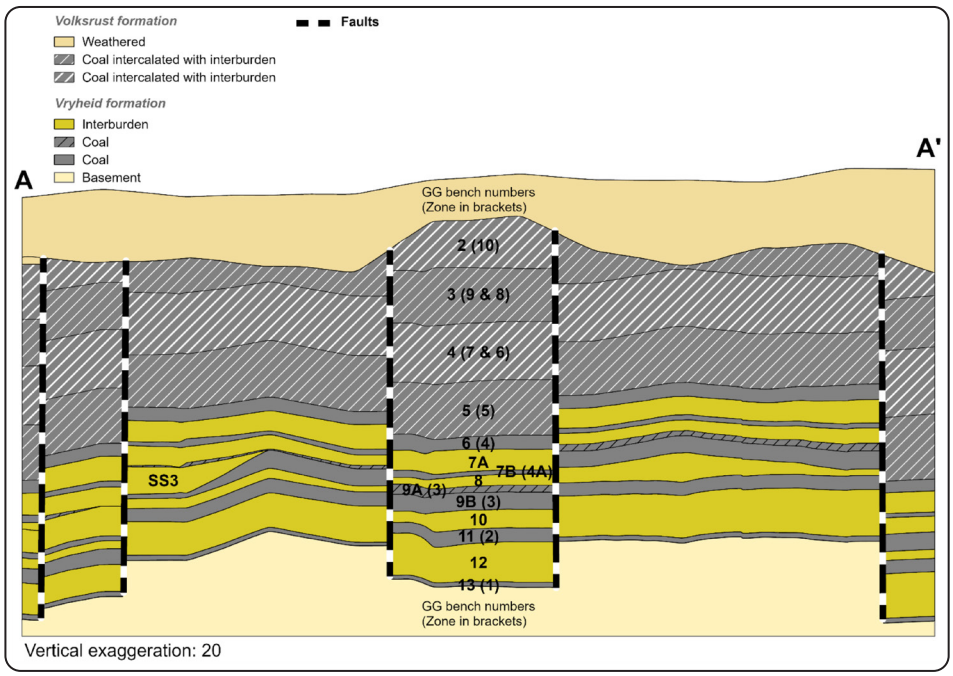


Figure 14: Grootegeluk cross-section



Ancillary Resource and Reserve information by operation continued

GROOTEGELUK continued

Resource estimation

Table 39: Resource estimation methodology and reporting

PROCESS	INFORMATION
Drilling, logging and sampling	In order to have sufficient material available from each sample for the required suite of analyses to relative densities of 2.20g/m3, large-diameter: 123mm-diameter drill core are drilled. The large-diameter drill holes are drilled in between the existing 500m x 500m grid of small-diameter drill holes. The reason for this placement of large-diameter drill holes was that analysis of samples from the large-diameter drill holes could be used to supplement analysis of existing small-diameter drill holes where samples and density fractions were absent. Sampling of drill holes is only conducted after the stratigraphy has been correlated. The geologist in charge supervises all drill hole drilling and is responsible for logging and sampling.
Laboratory and accreditation	Bureau Veritas, SANAS T0469.
Laboratory dispatch and receiving process	Each sample submitted to the laboratory is accompanied by a unique sample number for validation and tracking, as well as a submission list that serves as a sample advice sheet with instructions for analysis.
Laboratory quality control and quality assurance	As part of the assurance and control process, audits are performed internally and externally. Bureau Veritas is accredited for analytical work and participates in monthly local and international round robins.
Data datum	WGS84 – LO27
Drill hole database	acQuire
Number of drill holes in MR	1240
Number of drill holes used for Resource estimation	1 083
Number of drill holes used for classification	545
Data compositing and weighting	Conducted in acQuire
Data validation	Conducted using queries in acQuire and Excel
Geological modelling software	Geovia MinexTM
Estimation technique	Growth algorithm
Previous model date	2016
Last model update	2020
Grid mesh size	20m x 20m
Scan distance	2 000m
Data boundary	200m
Model build limits	Upper: limit of weathering and topography/collar Lower: Zone 1 floor
Model outputs	Roof, floor and thickness grids generated for structure Raw and wash quality grids
Changes to modelling process	Definition of Bench 9A to exclude sample 25 and 25S from the RoM bench
Thickness cut-off and extraction height considerations	Opencast ≤0.5m
Quality cut-offs (adb)	≥65% ash Volksrust Formation coal, ≥50% ash Vryheid Formation coal
Geological loss applied	Variable per bench, calculated each year considering geological model estimation error and physical geological loss

Table 40: Resource classification criteria

CATEGORY	TYPE OF DRILL HOLES	DRILL HOLE SPACING	STRUCTURALLY COMPLEX AREAS	DRILL HOLES/HA
Measured	Cored drill holes with applicable coal qualities	0m to 500m	Matrix (additional geophysically logged drill holes needed to augment existing data and determine classification)	0.1
Indicated	Cored drill holes with applicable coal qualities	500m to 1 000m	Matrix (additional geophysically logged drill holes needed to augment existing data and determine classification)	0.03
Inferred	Cored drill holes with applicable coal qualities	1 000m to 3 000m	Matrix (additional geophysically logged drill holes needed to augment existing data and determine classification)	0.03

Table 41: RPEEE considerations

ITEM	CRITERIA	CRITERIA MET	COMMENT
Geological data	Data has been validated and signed off by Competent Person	Yes	Geological structures, seam thickness ≤0.5m, ash content ≥65% ash Volksrust Formation coal and ≥50% Ash Vryheid Formation coal. Coal qualities reported on an air-dried basis
Geological model	Geological model has been considered and signed off	Yes	2020
Structural model	Structural model was considered and signed off	Yes	2019
Mining	Mining assumptions considered and defined	Yes	Opencast
Assurance	Exxaro internal audits and external audit conducted	Yes	Resource and LoM done in 2018
Economic evaluation	Exploitation study with economic and mining assumptions, including geotechnical and geohydrological assumptions	Yes	Exploitation strategy over mining right
Environmental	Reasonable demonstration that environmental approvals can be obtained within the context of local, regional and national governmental legislation	Yes	All applicable approvals are in place
Tenure	Formal tenure must be demonstrated with reasonable demonstration that a mining right approval can be obtained within the context of local, regional and national governmental legislation	Yes	Mining right with no impediments noted is valid till 2041 and there is reasonable expectation that the right will be renewed
Infrastructure	Assumptions used should be reasonable and within known/assumed tolerances or have examples of precedence	Yes	Existing infrastructure adequate or can be upgraded with new required infrastructure under construction
Market	A potential market for the product with a reasonable assumption that this market is sustainable	Yes	Current CSAs for local and export markets

Ancillary Resource and Reserve information by operation continued

GROOTEGELUK continued

Reserve estimation

Table 42: Reserve estimation

TOPIC	INFORMATION
Software	XPAC
Reserving process	RPM Global's XPAC mine-scheduling software is used to derive the remaining saleable Reserves from RoM Reserves in the approved pit layout. After converting the geological model's grids to the appropriate format, the floor, roof and thickness data as well as quality data for each bench is imported into the XPAC model. In this model, validations are performed to evaluate the data for possible discrepancies, such as incremental yields anomalies for each bench, thus ensuring they rise with increases in the relative float densities. The Resource category areas are also loaded into the XPAC model for Reserve categorisation purposes. The XPAC model integrates new geometallurgical principles into the LoM planning process and scheduling model to better predict as-mined plant performance. This is an all-inclusive model that can simulate all the plants in the Grootegeluk complex from one integrated flow sheet. The washability tables for each blast block are imported into the geometallurgical model (XPAC). The geometallurgical schedule imitates reality at Grootegeluk as portions of a single blast block can be allocated to several beneficiation plants in a particular scheduling period. Once the production schedule has run, a blend of blast blocks from different benches is allocated to each plant for each scheduling period. A new composite wash table is then derived for each plant for each scheduling period, which represents the blend of material fed from the mine to that plant. This composite wash table is then used to derive the specific products required to be produced by that plant for that period. A set of calibrated plant factors is applied per plant to adjust theoretical product yields to practical expected levels. It is thus not assumed that a block in its entirety is allocated to one plant only, as this does not represent reality at Grootegeluk. The scheduled mining blocks are of the same size as current actual blast blocks in the mine. The fact that material from different benches is combined and beneficiated simultaneously creates difficulty in reporting saleable product tonnages per bench. The preferred reporting practice at Grootegeluk is therefore RoM tonnes per bench and saleable product tonnes per beneficiation plant.
Conversion classification	Indicated Resources are generally converted to Probable Reserves and Measured Resources to Proved Reserves after consideration of all applicable modifying factors. If one or more of the modifying factors have not been fulfilled, Measured Resource is either not converted or the Measured Resource is converted but downgraded to Probable and the associated risk is clearly stated. Inferred Resources are not converted to Coal Reserves.
Inferred Resources inside LoM	Some 137Mt of Inferred Resources are included in the LoM plan, representing 5.3% of the LoM plan, and are not considered material. The impact of the Inferred Resources are known with the majority thereof occurring at the tail end of the LoM plan and addressed by an integrated exploration plan that is reviewed every year.
Modifying factors	
Average thickness cut-off	≤0.5m
Quality cut-offs	≥65% ash content (raw in situ)
Mining loss	No loss applied due to the fact that all mining boundaries are reached and no pillars are left
Boundary pillar	N/A
Dilution	Applied to in situ mineable Reserves due to the inter-layered composition of the deposit
Contamination	Varies per bench. 0 to 0.75m applied to interburden seams
Mining recovery efficiency	Varies per bench. 0 to 0.75m depending on bench height
Planned average slope angles	<61.7 degrees
Practical plant yield	Considered in the reserving process as per wash table information per combination of blocks per planning increment and the empirically determined practical yield adjustment factor
Strip ratio cut-off	Energy strip ratio >7GJ/ex-pit tonne
Environmentally sensitive areas	Areas underlying wetlands and other eco-sensitive areas are excluded from the Reserves, distance as per environmental requirements
Legal	The layout is within the mining right boundary and not closer than 15m
Social	There are no known socially sensitive areas in the pit layout (for example, graveyards and dwellings)
Geohydrological	Areas identified are flagged and excluded or reclassified in the reserving process

Table 43: Grootegeluk Coal Resource and Coal Reserve statement

Category	2021 (Mt)	2020 (Mt)	Difference in tonnes (Mt)	Difference (%)	Reason for change
Measured	2 481	2 532	(52)	(2)	Reduction of 55Mt through mining depletion, increase of 2Mt from the survey adjustment relating to 2020 reporting, minor changes due to reconciliation and mining in previously sterilised areas.
Indicated	1 421	1 422	0	0	
Inferred	338	338	0	0	
Total Coal Resources	4 240	4 292	(52)	(1)	
Proved	1 682	1 730	(48)	(3)	Reduction of 55Mt through mining depletion, increase of 2Mt from the survey adjustment relating to 2020 reporting, 2Mt reduction due to reconciliation, 6Mt increase due to rounding of figures between the various benches.
Probable	898	898	0	0	
Total Coal Reserves	2 580	2 628	(49)	(2)	

- *Rounding of figures may cause computational discrepancies.*
- *Tonnages quoted in metric tonnes and million tonnes (Mt). Coal Resources quoted as MTIS.*

Exploration summary

Summary of the exploration for the reporting year can be seen in Table 44. For detailed expenditure, please refer to Table 54.

Table 44: Exploration summary

OBJECTIVES	PROGRESS IN REPORTING YEAR	PLANS FOR NEXT REPORTING YEAR
Primarily on geological and geotechnical overburden material characterisation for the GGAMS project.	The appointment of a new exploration drilling service provider resulted in a delay in the start-up, necessitating a revision of the exploration plan. Thirty six (36) drill holes were successfully completed during the year. Thirty one (31) percussion holes were drilled for overburden material classification and sampling. These drill holes were also used to improve delineation of faults in structurally complex areas.	Nine thy seven (97) drill holes planned in 2022: • Twelve (12) rotary core drill holes for quality analysis and resource characterisation • Four (4) rotary core drill holes for geotechnical characterisation • Five (5) percussion drill holes to be used for water monitoring • Seventy six (76) percussion drill holes for overburden classification structural interpretation

Risks

Table 45: Grootegeluk risks

RISK	DESCRIPTION	MITIGATION
Fault position accuracy	The structure interpretation (fault positions) in the geological model is based on drill hole information that is widespread	Additional percussion drill holes are drilled in structurally complex areas after it is covered by the normal cored exploration drill hole grid.
Removal for weathered material in the pit	If the weathered material is not removed properly, downstream problems are experienced in the beneficiation plants.	A strict block declaration procedure is followed to minimise the amount of weathered material left on a block before blasting and loading occurs.
Semi-soft coking coal (SSCC) yield loss	The yield of the SSCC as obtained in the beneficiation plants at Grootegeluk is much lower than the theoretical yield as determined from exploration drill hole samples at Bureau Veritas laboratory. The main reason for this phenomenon is related to near density material that is inadvertently misplaced to the power station coal product and lost to slimes during the mining and beneficiation process.	Although the low actual SSCC yield has a negative impact on the mine's profitability, it poses a low risk on the Resource because empirically calculated plant correlation factors are used in the Mine Planning department to compensate for the misplaced material in the plant.
Power station coal sulphur content	Benches that are utilized for power station coal by means of crush and screen operations, have high sulphur concentrations. This is mainly due to the presence of pyrite nodules within the coal structure. Should this RoM material have to be beneficiated to lower the Sulphur content, an associated yield loss and additional beneficiation costs will be incurred. There will also be less dry coal material available for the management of the coal product moisture content.	To cater for the impact of pyritic sulphur in Vryheid Formation coal, the GG7 plant has the capacity to process the coarse fraction, where the pyritic sulphur typically reports. This assists in reducing the final sulphur in the product.

Ancillary Resource and Reserve information by operation continued

Operational excellence

Grootegeluk mine continually strives to improve operational performance in all aspects. To this end, the mine has embarked on several initiatives to improve not only data accuracy, but also, readiness to assist in decision making and Resource optimisation. Building on the success of the short-term sample model, the mine is investigating the implementation of a sample-based long-term model that covers the entire Resource area and LoM thus unlocking the value in aligning actual mining conditions, increased flexibility and prevailing market conditions. In conjunction with the sample-based long-term model, the mine has implemented the OCCS mine planning software, which is a fully integrated mine planning solution that is envisaged to unlock incredible value across the MRM value chain. Lastly, the Grootegeluk Survey department has recently commissioned in-pit static scanners to augment their current survey capabilities (which include drones and mobile scanners) and to aid in in-time data collection. These scanners will aid in providing real-time data.

Truck and shovel at Grootegeluk

THABAMETSI

Thabametsi is divided into two portions, a northern open cast portion and a southern underground portion. The Northern open cast portion aims to produce power station coal for an on-site IPP while the Southern underground portion is earmarked for beneficiated high value products. The strategic partner identified to undertake the development of the IPP has since withdrawn from the project and Exxaro is evaluating various options on the development of this Resource.

Thabametsi overview

Table 46: Thabametsi overview

TOPIC	INFORMATION	
Location	22km west of the town of Lephalale in Limpopo, South Africa	
History	Previous ownership	Material notes
1976 to 1988	Iscor – Iscor mining	Exploration drilling
1989 to 2006	Kumba	Exploration drilling
2007 to 2015	Exxaro Resources	Prospecting right and exploration activities specifically on the project area
2016 to current	Exxaro Resources	Mining right registered in 2016, valid till 2046
Adjacent properties	Grootegeluk Mine to the east	
Infrastructure	Thabametsi is adjacent to Grootegeluk and therefore will use the same infrastructure. It can be reached from Lephalale via the hard-topped Nelson Mandela Drive, which is linked to the R510 road connecting Lephalale to the town of Vaalwater to the south and the Stockpoort border post between South Africa and Botswana to the north. Power supply to Grootegeluk is obtained directly from the power station via two 132kV lines . Raw water is delivered to the mine and to a water-treatment plant on the farm Zeeland by the 700mm-diameter Hans Strijdom pipeline. The pipeline originates at the Mokolo Dam, in the Waterberg mountain.	
Coalfield	Waterberg coalfield	
Main seams	The upper part of the coal deposit, the Volksrust Formation (approximately 60m thick) is classified as a thick interbedded seam deposit type, comprising intercalated mudstone or carbonaceous shale and bright coal layers. The Vryheid Formation (approximately 55m thick) forms the lower part of the coal deposit and comprises carbonaceous shale and sandstone with interbedded dull coal seams varying in thickness from 1.5m to 9m. It is therefore classified as a multiple-seam deposit type.	
Seam development	The geology is similar to Grootegeluk's geology but practical mining practice required a different bench configuration. In the north, the full succession of the Volksrust and Vryheid formations is present. However, further south, the Volksrust Formation thins out and eventually disappears. A pertinent channel sandstone in the northern portion of the project area affects benches 9A and 9B.	
Depositional control	The Zoetfontein fault forms the boundary of the Waterberg coalfield in the north while the Eenzaamheid fault forms the boundary in the south. The Daarby fault, with a throw of some 350m, divides the coalfield into a deep north-eastern portion and a shallow south-western portion. The first fresh coal in the shallow south-western portion is on average 20m below surface. The lowermost coal seam (Zone 1) occurs at a depth of about 130m in the shallow portion of the coalfield but this may vary depending on the local structure. The predominantly horizontal coal-bearing formations have a very gentle dip to the south-east near Grootegeluk. Only a few dolerite dykes outcrop in the south-eastern portion of the Waterberg coalfield and no sills have been encountered in any exploration drill holes drilled in the mine right area to date.	
Resources and Reserves	The Resource extent is restricted by the depositional controls discussed above. The Reserves are restricted within the Resource blocks.	
Mining method	The project area is divided into a northern opencast portion and a southern underground area.	
Beneficiation	N/A	
Product	The northern portion aims to produce power station coal for an on-site IPP as part of phase 1.	
Market	Local	
Mining right	Thabametsi has an approved mining right that covers some 5 455ha.	
Environmental approvals	All environmental appeals have been favourably addressed for the declared Reserves.	
Projects/Feasibility studies	A feasibility study on phase 1 was successfully concluded in 2016 and studies on extending the phase and the southern project area are ongoing. In October 2016, the South African Minister of Mineral Resources and Energy announced that the Thabametsi power project, for which Thabametsi project has a 30-year CSA, had been selected as a preferred bidder in the first bid window of South Africa's coal-baseload IPP procurement programme. The subsequent process to realise this initiative has progressed during the last number of years. The project development agreement with our IPP project partner, however, lapsed during the previous reporting year and we subsequently changed our reporting of Proved Reserves to Probable category to address this uncertainty. Exxaro is currently ensuring that all compliance actions are executed.	

Ancillary Resource and Reserve information by operation continued

THABAMETSI continued

Thabametsi overview continued

Figure 15: Thabametsi project

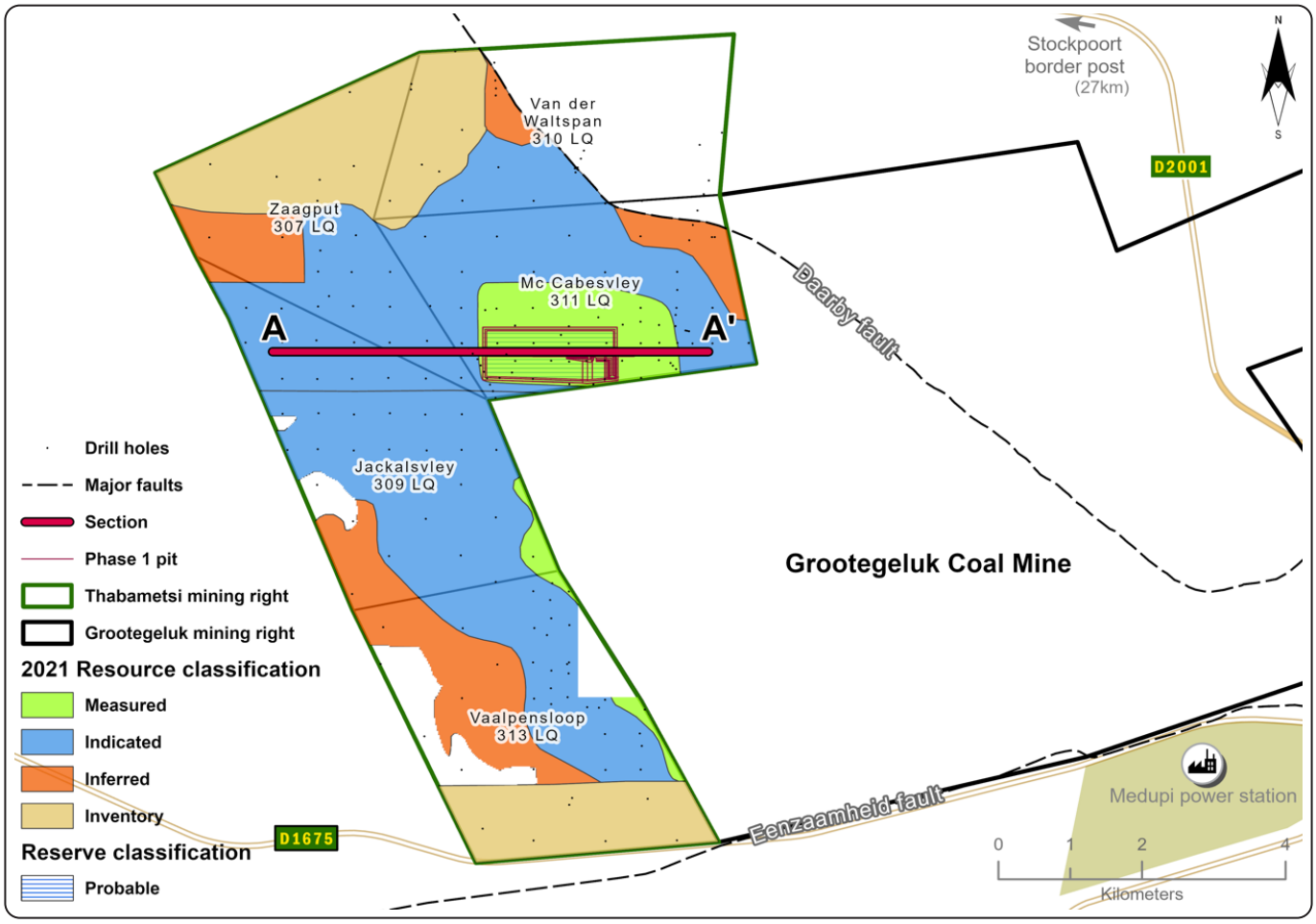
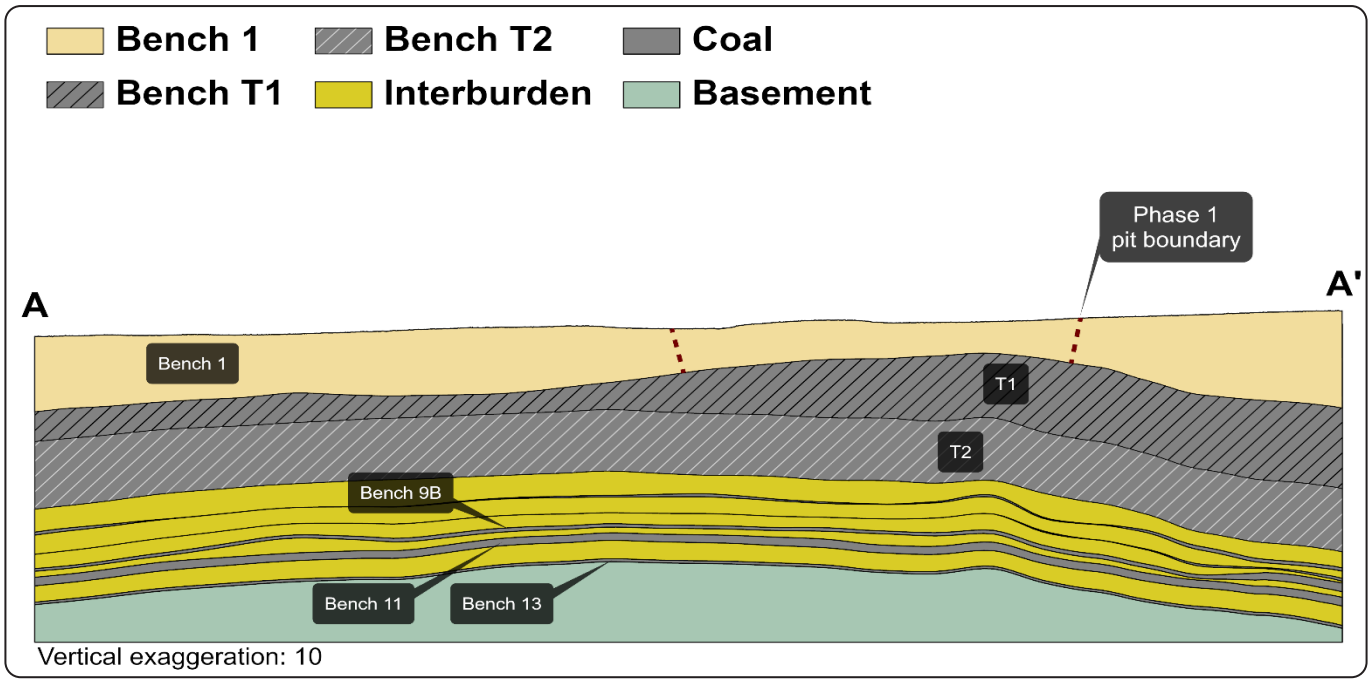


Figure 16: Thabametsi cross-section



Resource estimation

Table 47: Resource estimation methodology and reporting

PROCESS	INFORMATION
Drilling, logging and sampling	Logging and sampling follow the same protocols as at Grootegeluk mine.
Laboratory and accreditation	Bureau Veritas, SANAS T0469.
Laboratory dispatch and receiving process	Sampling of drill holes is only conducted after the stratigraphy has been correlated. The geologist in charge supervises all drill hole drilling and is responsible for logging and sampling. Each sample submitted to the laboratory is accompanied by a unique sample number for validation and tracking, as well as a submission list that serves as a sample advice sheet with instructions for analysis.
Laboratory quality control and quality assurance	The laboratory follows one of four standard suites of analysis for each sample from Grootegeluk, namely Volksrust Formation coal, Volksrust Formation shale, Vryheid Formation coal and Vryheid Formation shale. Emphasis is placed on ensuring data integrity though rigorous procedures and supervision while processing. As part of the assurance and control process, audits are performed internally and externally. Bureau Veritas is accredited for analytical work and participates in monthly local and international round robins.
Data datum	WGS84 – LO27
Drill hole database	acQuire
Number of drill holes in MR	218
Number of drill holes used for Resource estimation	116
Number of drill holes used for classification	116
Data compositing and weighting	Coal analysis and beneficiation (CAB) module in Sable Data Warehouse
Data validation	Conducted using queries in acQuire and Excel
Geological modelling software	Geovia Minex™
Estimation technique	Growth algorithm
Previous model date	2014
Last model update	2015
Grid mesh size	45m x 45m
Scan distance	1 000m
Data boundary	300m
Model build limits	Upper: limit of weathering and topography/collar Lower: Zone 1 floor
Model outputs	Roof, floor and thickness grids generated for structure Raw and wash quality grids
Changes to modelling process	None
Thickness cut-off and extraction height considerations	Opencast ≤0.5m
Quality cut-offs (adb)	Ash ≥65%
Geological loss applied	Variable per bench based on the adjacent Grootegeluk methodology

Ancillary Resource and Reserve information by operation continued

THABAMETSI continued

Resource estimation continued

Table 48: Resource classification criteria

CATEGORY	TYPE OF DRILL HOLES	DRILL HOLE SPACING	STRUCTURALLY COMPLEX AREAS	DRILL HOLES/HA
Measured	Cored drill holes with applicable coal qualities	0m to 350m	(Matrix) Additional geophysically logged drill holes needed	0.08
Indicated	Cored drill holes with applicable coal qualities	350m to 500m	(Matrix) Additional geophysically logged drill holes needed	0.04
Inferred	Cored drill holes with applicable coal qualities	500m to 1 000m	(Matrix) Additional geophysically logged drill holes needed	0.01

Table 49: RPEEE considerations

ITEM	CRITERIA	CRITERIA MET	COMMENT
Geological data	Data has been validated and signed off by Competent Person	Yes	Geological structures, seam thickness ≤0.5m, ash content ≥65%. Coal qualities reported on an air-dried basis
Geological model	Geological model has been considered and signed off	Yes	2015
Structural model	Structural model was considered and signed off	Yes	2015
Mining	Mining assumptions considered and defined	Yes	Opencast and underground
Assurance	Exxaro internal audits and external audit conducted	Yes	2015
Economic evaluation	Exploitation study with economic and mining assumptions, including geotechnical and geohydrological assumptions	Yes	Studies that underpin the IPP study and mining right mine works programme
Environmental	Reasonable demonstration that environmental approvals can be obtained within the context of local, regional and national governmental legislation	Yes	All environmental approvals and land ownership in place
Tenure	Formal tenure must be demonstrated with reasonable demonstration that a mining right approval can be obtained within the context of local, regional and national governmental legislation	Yes	Mining right, expires in 2046 with no impediments noted.
Infrastructure	Assumptions used should be reasonable and within known/assumed tolerances or have examples of precedence	Yes	Current infrastructure
Market	A potential market for the product with a reasonable assumption that this market is sustainable	Yes	IPP and current Grootegeluk steam coal market

Reserve estimation

Table 50: Reserve estimation

TOPIC	INFORMATION
Software	XPAC
Reserving process	For the phase 1 of the IPP feasibility study, XPAC mine-scheduling software is used to derive remaining saleable Reserves from RoM Reserves in the approved pit layout. After converting the geological model's grids to the appropriate format, the floor, roof and thickness data as well as the quality data for each bench is imported into the XPAC model. With this model, validations are performed to evaluate the data for possible mistakes, such as incremental yields for each bench rising with increases in relative float densities.
Conversion classification	Indicated Resources are generally converted to Probable Reserves and Measured Resources to Proved Reserves after consideration of all applicable modifying factors. If one or more of the modifying factors have not been fulfilled, Measured Resource is either not converted or the Measured Resource is converted but downgraded to Probable and the associated risk is clearly stated. Inferred Resources are not converted to Coal Reserves. The Coal Reserve is based on a bankable feasibility project level of investigation. The project development agreement with our IPP project partner lapsed during the previous reporting year and we subsequently changed our reporting of Proved Reserves to the Probable category to address this uncertainty. Exxaro is currently ensuring that all compliance actions are executed.
Inferred Resources inside LoM	N/A
Modifying factors	
Average thickness cut-off	≤1m
Quality cut-offs	Raw CV ≤11Mj/kg
Mining loss	*T1 – 0.5m losses to overburden *T2 – 0.25% of coal left in pit bottom
Boundary pillar	N/A
Dilution	Applied to in situ mineable Reserves due to inter-layered composition of deposit
Contamination	T2 – 0.3m
Mining recovery efficiency	No additional losses due to proposed mining method. Coal transfer between benches T1 and T2 will balance out over time as both go to same plant
Planned average slope angles	35 degrees
Practical plant yield	Crushing and screening process 98%
Strip ratio cut-off	Energy strip ratio >7Gj/ex-pit tonnes Strip ratio <0.3m^3/t
Environmentally sensitive areas	No sensitive areas in pit layout
Legal	The layout is within the mining right boundary
Social	There are no known socially sensitive areas in the pit layout (for example, graveyards and dwellings)
Geohydrological	No areas identified in the mining area

** T1 and T2 mining benches (Figure 16).*

Ancillary Resource and Reserve information by operation continued

THABAMETSI continued

Reserve estimation continued

Table 51: Thabametsi Coal Resource and Coal Reserve statement

Category	2021 (Mt)	2020 (Mt)	Difference in tonnes (Mt)	Difference (%)	Reason for change
Measured	270	270			
Indicated	749	749			
Inferred	2 857	2 857			
Total Coal Resources	3 876	3 876			No change
Proved					
Probable	130	130			
Total Coal Reserves	130	130			

- *Rounding of figures may cause computational discrepancies.*
- *Tonnages quoted in metric tonnes and million tonnes (Mt). Coal Resources quoted as MTIS.*

Exploration summary

Summary of the exploration for the reporting year can be seen in Table 52. For detailed expenditure, please refer to Table 54.

Table 52: Exploration summary

OBJECTIVES	PROGRESS IN REPORTING YEAR	PLANS FOR NEXT REPORTING YEAR
Reviewing of future exploitation options for full mining right area	Various options concluded	Evaluation of options for the best exploitation strategy.

Risks

Table 53: Thabametsi risks

RISK	DESCRIPTION	MITIGATION
Market	The project development agreement with our IPP project partner lapsed.	Exxaro is investigating various future options for the development of the project, communicated to the DMRE, including alternative markets such as the Grootegeluk steam coal market.

Operational excellence

Currently not an operating mine.

Silo at ECC

Exploration expenditure

Table 54: Exploration expenditure

	2020 actual		2021 actual				2022 planning*	
Mine / Project	**Number of drill holes**	**Total cost (Rm)**	**Number of drill holes**	**Drilling cost (Rm)**	**Analysis and other costs (Rm)**	**Total costs (Rm)**	**Number of drill holes**	**Total cost (Rm)****
Belfast	51	1.3	53	2.4	1.0	3.4	10	0.5
Leeuwpan	10	0.5	12	0.4	0.2	0.6	10	0.7
Matla***	31	26.2	53	18.7	1.3	20.0	55	18.0
Grootegeluk	63	7.3	36	2.9		2.9	112	29.7
Thabametsi****		0.8				1.2		0.8
Others (projects not reported)								
Total			154	24.3	2.5	28.0	187	49.7
Mafube (not under operational control)	141	6.3	295	10.2	4.4	14.6	181	10.1
Moranbah South project (not under operational control)*****	12	A$2.5m	5	A$0.78	A$0.71	A$1.49	2	A$9.7

* *Non-committed.*
** *Includes all associated exploration cost such as drilling, geophysics surveys and geotechnical, hydrogeological and metallurgical test work, excluding personnel, and excludes horizontal drilling.*
*** *2021 cost includes directional surface-to-seam drilling.*
**** *Includes Resource studies.*
***** *Include surface to in-seam drill holes drilled with two branches.*

No exploration was conducted on areas not included in the Coal Resource statement. Exploration plans are available on request at the company secretary.

Mafube operations

Endorsement

The Exxaro lead Competent Persons are appointed by the executive management team.

The Exxaro lead Coal Resource Competent Person is Henk Lingenfelder, a member of the GSSA and registered (400038/11) with the South African Council for Natural Scientific Professions. He has a BSc (Hons) in geology and 26 years of experience as a geologist in coal, iron ore and industrial minerals.

The person in Exxaro designated to take corporate responsibility for Coal Resources, Henk Lingenfelder, the undersigned, has reviewed and endorsed the reported estimates.

Henk Lingenfelder

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Pr Sci Nat (400038/11)
Group manager: geoscience
263 West Avenue, Die Hoewes
Centurion 0163
South Africa

South African Council for Natural Scientific Professions

Private Bag X540
Silverton 0127
Gauteng
South Africa

The Exxaro lead Coal Reserve Competent Person is Chris Ballot, a mining engineer registered (20060040) with ECSA. He has 25 years of experience in iron ore, mineral sands and coal in various technical and management roles. His qualifications include BEng (mining), GDE and MBA.

The person in Exxaro designated to take corporate responsibility for Coal Reserves, Chris Ballot, the undersigned, has reviewed and endorsed the reported estimates.

Chris Ballot

BEng (mining)
ECSA 20060040
Group manager: mining
263 West Avenue, Die Hoewes
Centurion 0163
South Africa

Engineering Council of South Africa

Private Bag X691
Bruma 2026
Gauteng
South Africa

Both parties are in the full-time employment of Exxaro, Henk Lingenfelder as the group manager: geosciences and Chris Ballot as the group manager: mining. Both parties have consented to the inclusion of Resources and Reserves estimates in the 2021 integrated report. Exxaro has written confirmation from the Competent Persons that the reporting is compliant with the SAMREC Code, the relevant portions of Table 1 and the JSE Listings Requirements (section 12), in the form and context in which it was intended JSE LR 12.13(i)(6) and they consent to the publication of the report.

Abbreviations

adb	Air-dried basis
CMRR report	Consolidated Mineral Resources and Mineral Reserves report
CSA	Coal supply agreement
CV	Calorific value
DAF	Dry ash free volatiles
GIS	Geographic information system
ha	Hectare
IM	Inherent moisture
JORC Code	Australasian Code for Reporting of Exploration Results, Mineral Resources and Mineral Ore Reserves, 2012 edition
JSE	JSE Limited (founded in 1887 as the Johannesburg Stock Exchange)
kcal/kg	Kilocalories per kilogram
LoM	Life of mine
LoMP	Life of mine plan
MTIS	Mineable tonnes in situ
MJ/kg	Megajoules per kilogram
Mt/Mtpa	Million tonnes/per annum
MRM	Mineral Resource Management
OCCS	Opencast Coal Solution (mine scheduling software)
RODA	Risk and opportunity domain analysis
RoM	Run of mine
SAMREC	South African Code for Reporting of Exploration Results, Mineral Resources and Mineral Reserves, 2016 edition
SANS	South African National Standard
UGCS	Underground Coal Solution (mine scheduling software)

Appendix

Table 55: Shareholding and tenure of reported Mineral Resources and Mineral Reserves

Complex	UG/OC	Name of right	Type	Status	% attributable to Exxaro	Expiry date	Remainder attributable to	Impediments
Matla	Matla (UG)	Matla (327MR)	Mining right	Executed	100	4 March 2025		
Leeuwpan	Leeuwpan (OC)	Leeuwpan (157MR)	Mining right	Registered	100	31 May 2039		
		Leeuwpan Ext (171MR)	Mining right	Registered	100	31 May 2039		
Mafube	Mafube (OC)	Mafube (172MR)	Mining right	Registered	50	30 July 2030	Anglo American Coal	
		Nooitgedacht (10026MR)	Mining right	Registered	50	13 November 2043	Anglo American Coal	
Strathrae*	Strathrae (OC)	Strathrae (328MR)	Mining right	Granted	100	22 November 2019		
			Renewal	New application	100			
Belfast	Belfast (OC)	Belfast (431MR)	Mining right	Registered	100	20 February 2043		
Grootegeluk	Grootegeluk (OC)	Grootegeluk (46MR)	Mining right	Registered	100	13 February 2041		
Thabametsi	Thabametsi (UG and OC)	Thabametsi (10013MR)	Mining right	Registered	100	20 May 2046		
Australian region	Moranbah South (OC and UG)	MDL277 and 377	Mineral development licences	Granted	50	31 July 2026 and 30 September 2023	Anglo American Coal	
		EPC548	Exploration permit	Executed	50	22 February 2027	Anglo American Coal	

** No Resources declared.*
PR: Prospecting right.
MR: Mining right

Table 56: Shareholding and tenure of reported Base Metal Resources and Reserves

Commodity	Name of right	Type	Status	% attributable to Exxaro	Expiry date	Remainder attributable to	Impediments
Base metals	Deeps and Swartberg (zinc, lead, copper and silver)	Converted right	Executed	26	30 September 2038	Vedanta Resources	
	Gamsberg North and Gamsberg East prospecting (zinc)	Converted right	Executed	26	18 August 2038	Vedanta Resources	

Table 57: Coal production figures (Mt)

Operation	Product	2020	2021	FC 2022	FC 2023
Grootegeluk	Thermal coal	26.6	25.3	26.7	26.7
Grootegeluk	Metallurgical coal	2.2	1.9	3.0	3.8
Matla	Thermal coal	6.2	5.9	5.7	5.4
Leeuwpan	Thermal coal	3.7	2.4	4.9	
Belfast	Thermal coal	2.9	2.5	3.3	3.4
Mafube (buy-ins from joint venture)	Thermal coal	1.8	1.4	2.0	1.9

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