IMPLATS

IMPLATS
Distinctly Platinum

Mineral Resource and Mineral Reserve Statement 2018

Contents

01 INTRODUCTION AND OVERVIEW

The report	2
Mineral Resource and Mineral Reserve Statement 2018 at a glance	3
Integrated Mineral Resource management	6
Mine planning	7
Compliance	8
Auditing and risk	11
Third-party assurance	13
Mineral rights status	14

02 SCENE SETTING

Regional geological settings	16
The Bushveld Complex	16
The Great Dyke	19
Exploration review	22
Relevant assessment and reporting criteria	23
The environment	26
Attributable Mineral Resources and Mineral Reserves	27
Mineral Resources summary, exclusive of Mineral Reserves	31
Reconciliation	33
Historic production	35
Life-of-mine production	36

03 THE DETAILS – MINERAL RESOURCES AND MINERAL RESERVES

Impala	38
Marula	54
Two Rivers	66
Zimplats	76
Mimosa	88
Afplats	100
Chromium ore at Implats	108
Areas excluded from Mineral Resource estimates	109

04 APPENDICES

Glossary of terms	110
Mineral Resource and Mineral Reserve definitions	113
Contact details and administration	115

IMPALA PLATINUM HOLDINGS LIMITED (IMPLATS) IS ONE OF THE WORLD'S FOREMOST PRODUCERS OF PLATINUM AND ASSOCIATED PLATINUM GROUP METALS (PGMs). IMPLATS IS CURRENTLY STRUCTURED AROUND FIVE MAIN OPERATIONS WITH A TOTAL OF 20 UNDERGROUND SHAFTS. OUR OPERATIONS ARE LOCATED WITHIN THE BUSHVELD COMPLEX IN SOUTH AFRICA AND THE GREAT DYKE IN ZIMBABWE, THE TWO MOST SIGNIFICANT PGM-BEARING ORE BODIES IN THE WORLD.

IMPLATS HAS ITS LISTING ON THE JSE LIMITED (JSE) IN SOUTH AFRICA, THE FRANKFURT STOCK EXCHANGE (2022 US$ CONVERTIBLE BONDS) AND A LEVEL 1 AMERICAN DEPOSITARY RECEIPT PROGRAMME IN THE UNITED STATES OF AMERICA.

OUR HEADQUARTERS ARE LOCATED IN JOHANNESBURG AND THE FIVE MINING OPERATIONS ARE IMPALA, ZIMPLATS, MARULA, MIMOSA AND TWO RIVERS. THE STRUCTURE OF OUR OPERATING FRAMEWORK ALLOWS FOR EACH OF OUR OPERATIONS TO ESTABLISH AND MAINTAIN CLOSE RELATIONSHIPS WITH THEIR STAKEHOLDERS WHILE OPERATING WITHIN A GROUP-WIDE APPROACH TO MANAGING THE ECONOMIC, SOCIAL AND ENVIRONMENTAL ASPECTS OF SUSTAINABILITY.

Information available elsewhere in this report

Information available on our website

Welcome to our 2018 Mineral Resource and Mineral Reserve report

THIS REPORT CONTAINS THE 2018 MINERAL RESOURCE AND MINERAL RESERVE STATEMENT OF IMPALA PLATINUM HOLDINGS LIMITED AS AT 30 JUNE 2018.

THE REPORT PROVIDES UPDATED ESTIMATES AND RECONCILIATION OF MINERAL RESOURCES AND MINERAL RESERVES AND CONFORMS TO THE SOUTH AFRICAN CODE FOR REPORTING OF EXPLORATION RESULTS, MINERAL RESOURCES AND MINERAL RESERVES (SAMREC 2016). THE REPORT ALSO CONFORMS TO SECTION 12.13 OF THE JSE LISTINGS REQUIREMENTS AND HAS BEEN SIGNED OFF BY THE COMPETENT PERSONS.

FINANCIAL FOCUS

1.58 billion
gross profit

13.63 billion
impairment, impacts the group earnings

171 cents
per share in basic headline loss

3.7 billion
gross cash and unutilised facilities of R2.5 billion available

OPERATIONAL FOCUS

5.6%
increase in tonnes milled to 19.36 million

0.4%
increase in stock adjusted unit cost

4.0%
decrease in gross refined platinum production – impacted by smelter repairs and a fire at No 5 furnace

Additional information regarding Implats is provided in the following reports, all of which will be available at www.implats.co.za

Integrated Report

- Information about our stakeholders, their material matters, risk, strategy and performance
- Information about our operations, Mineral Reserves and Mineral Resources, business context, environment, business model, and intellectual capital contained in our risk and remuneration processes
- Overall assurance provided
- Publication release scheduled for the end of October

Annual Financial Statements

These annual financial statements were prepared according to International Financial Reporting Standards (IFRS) of the International Accounting Standards Board (IASB), the SAICA Financial Reporting Guides as issued by the Accounting Practices Committee and Financial Reporting Pronouncements as issued by the Financial Reporting Standards Council, the requirements of the South African Companies Act, Act 71 of 2008, the Listings Requirements of the JSE Limited and the recommendations of King IV™*.

Sustainable Development Report

- Detail on material economic, social and environmental performance
- GRI G4 core compliance
- Internal reporting guidelines in line with the UN Global Compacts
- Independent assurance report

We welcome your feedback to make sure we are covering the things that matter to you.

Go to **www.implats.co.za** or email **investor@implats.co.za** for the feedback form, or scan the code above with your smart device.

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The report

Forward looking statements

This report contains certain forward looking statements and forecasts, which involve risk and uncertainty because they relate to events and depend on circumstances that occur in the future. There are a number of factors that could cause actual results or developments to differ materially from those expressed or implied by these forward looking statements.

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Implats has its listing on the JSE Limited (JSE) in South Africa, the Frankfurt Stock Exchange (2022 US$ convertible bonds) and a level 1 American Depositary Receipt programme in the United States of America.

Our headquarters are in Johannesburg and the five primary operations are Impala, Zimplats, Marula, Mimosa and Two Rivers. The structure of our operating framework allows for each of our operations to establish and maintain close relationships with their stakeholders, while operating within a Group-wide approach to managing the economic, social and environmental aspects of sustainability.

The report relates to the Mineral Resource and Mineral Reserve Statement, compiled for Implats and its subsidiaries and provides the status as at 30 June 2018. An abridged version is included in the Implats integrated annual report for 2018, which is published annually and available at **www.implats.co.za**.

The report seeks to provide transparent and compliant details relating to the Mineral Resources and Mineral Reserves that are considered to be material to stakeholders.

Implats Mineral Resource and Mineral Reserve Statement 2018 at a glance

Perspective

The Mineral Resource and Mineral Reserve Statement as at 30 June 2018 is collated at a time when the platinum industry continues to face significant external challenges. The prevailing depressed metal prices are reflected in the fact that capital investment has virtually dried up throughout the industry. At Implats, greenfields exploration has been terminated and shaft sinking operations at Impala's 17 Shaft and Afplats' Leeuwkop Shafts remain suspended. Against this background material changes in the Mineral Resource and Mineral Reserve estimates are detailed in this report. **The material impact of the Impala strategic review is reflected in this Mineral Resource and Mineral Reserve Statement.** Despite the difficult circumstances some operations continue to deliver stellar production performances at Zimplats, Marula, Mimosa and Two Rivers.

Rustenburg review

The Impala Rustenburg operation underwent a detailed scrutiny during the past year in view of a loss-making outlook. The objective of the strategic review was to create a sustainable investment case for Impala Rustenburg that secures long-term profitability through optimisation and restructuring of the operations. Key consideration of the review was the financial robust business case within the context of social responsibility to secure long-term employment. The review process concluded on the most viable option to achieve a sustainable future operation at Impala. This restructuring process provided for a focused, agile and profitable future state that safeguards the future of some 27 000 employees.

To this effect the Implats Board has approved the strategy to cease operations at unprofitable shafts at Impala. The older shafts such as 1, 4 and 9 Shafts with limited remaining Mineral Reserves are targeted for harvesting. The higher cost, mature shafts such as 12 and 14 Shafts will be optimised and operated under strict performance conditions ahead of their planned cessation towards the end of FY2020. This restructuring of Impala Rustenburg will yield a change from 11 operational shafts ramping up to 750Koz platinum, to six operational shafts producing approximately 520Koz platinum per annum. **A direct outcome is a material reduction in the Impala Mineral Reserve estimate.**

Zimplats release of land

Zimplats announced on 6 June 2018 that the issue concerning the proposed compulsory acquisition of a portion of Zimplats' mining lease area, as well as the issue of security of Zimplats' mining tenure, has been resolved amicably between Zimplats and the Zimbabwean Government (GoZ) to the mutual benefit of the parties. Zimplats agreed to release to the GoZ land measuring 23 903 hectares within Zimplats' mining lease area in support of the government's efforts to enable participation by other investors in the platinum mining industry in Zimbabwe. Following this release of land, Zimplats now holds two separate and non-contiguous pieces of land and Zimplats was granted with effect from 31 May 2018, two separate mining leases over the two pieces of land measuring 6 605 hectares and 18 027 hectares respectively. These mining leases replaced the special mining lease, which was due for renewal in August 2019, thus securing the operating subsidiary's mining tenure. The release of land does not impact on the 30-year mine plan, but resulted in a material reduction in the Zimplats Mineral Resource estimate.

Group operations

The Implats structure remained largely unchanged during the past year with operations at Impala in the Rustenburg area of the North West province, the refinery at Springs in the Gauteng province, the Marula Mine in the Limpopo province, Zimplats and Mimosa Mines operating in Zimbabwe, the Two Rivers Mine near Burgersfort in the Limpopo province and the Afplats project near Brits in the North West province. During the past year Implats secured a minority 15% interest in the Waterberg Joint Venture project (Waterberg JV Resources (Pty) Ltd) in the Limpopo province with the option to increase the Implats stake to 50.01%. At year-end the Mineral Resource estimate for the Waterberg JV project was in progress and such attributable interest is not included in this report; the size of the attributable Mineral Resource is not material at the Implats Group level.

Group structure

Implats Mineral Resource and Mineral Reserve Statement 2018 at a glance

Headline numbers
(for more details see pages 27 and 29)

Attributable estimates

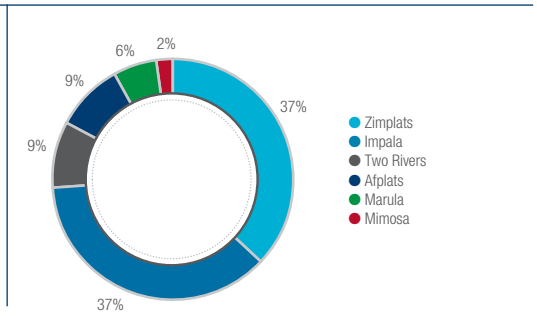
		2018	2017
Mineral Resources*	Moz Pt	**133.8**	191.6
	Moz 4E	**243.9**	360.4
	Mt	**1 741**	2 787
Mineral Reserves	Moz Pt	**21.2**	22.4
	Moz 4E	**40.0**	41.0
	Mt	**365**	358

** Mineral Resource estimate is inclusive of Mineral Reserves.*

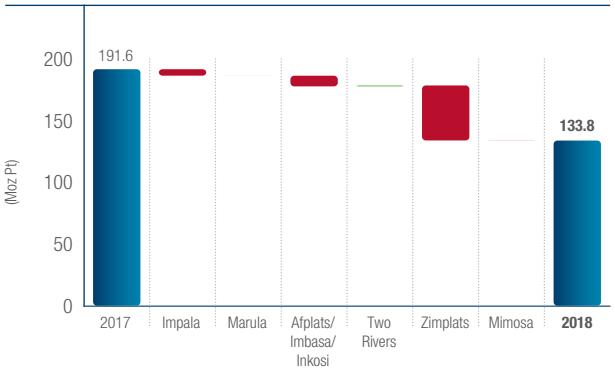
Summary Mineral Resources
(for more detail see page 27)

There has been material changes in the attributable Group Mineral Resource estimate which reduced by 57.8Moz Pt. The change is dominated by the release of land at Zimplats. The strategic decision to exit certain prospecting rights at Imbasa and Inkosi and also the Impala/Royal Bafokeng Resources Platinum (Pty) Ltd Unincorporated Joint Venture contributed notably to the reduction. The Impala strategic review to cease operations at certain shafts did not impact on the Mineral Resource estimate. The estimate as at 30 June 2018 is dominated by Zimplats and Impala, who together contribute some 74% of the total attributable Group Mineral Resources.

Attributable Mineral Resources of 133.8Moz Pt as at 30 June 2018



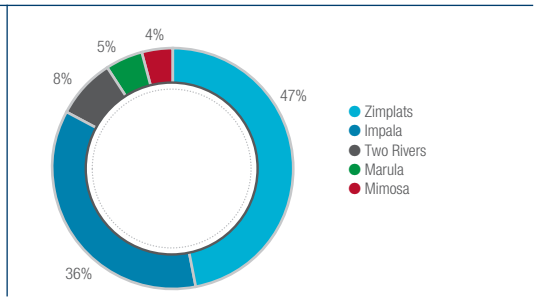
Attributable Mineral Resources as at 30 June 2018 (variance Moz Pt)



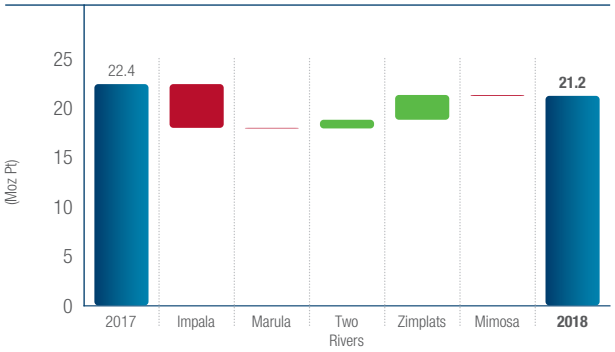
Summary Mineral Reserves
(for more detail see page 29)

Overall the attributable Group Mineral Reserve estimate did not change significantly and decreased by 1.2Moz Pt to 21.2Moz Pt. The resultant estimate as at 30 June 2018 is based on a **material reduction at Impala** following the detailed review and also a material increase at Zimplats due to the conversion of some Upper Ores to Mineral Reserves. Furthermore the addition of the RE portion of Kalkfontein at Two Rivers had a positive impact on the combined Group Mineral Reserves. Some 47% of the attributable Group Mineral Reserves (Pt) is located at Zimplats and a further 36% at Impala.

Attributable Mineral Reserves of 21.2Moz Pt as at 30 June 2018



Attributable Mineral Reserves as at 30 June 2018 (variance Moz Pt)



Implats Mineral Resource and Mineral Reserve Statement 2018 at a glance

Compliance

(for more detail see page 8)

The Mineral Resource and Mineral Reserve Statement is compiled in accordance with guidelines and principles of the South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (SAMREC Code), the South African Code for the Reporting of Mineral Asset Valuation (SAMVAL Code) and Section 12.13 of the JSE Listings Requirements as updated from time to time. Supporting documentation includes detailed internal reports, SAMREC Table 1 reports, and regular third-party reviews. A summary list of Competent Persons who compiled this report is included in this document on page 10. While Zimplats complies with guidelines and principles of the JORC Code, the definitions are either similar or do not vary materially from the SAMREC Code. The Zimplats estimates reflected in this report comply with the SAMREC Code and Section 12.13 of the JSE Listings Requirements.

Implats subscribes to the principles of transparency, materiality and competency as per the SAMREC Code.

Note that:

> Mineral Resources are reported inclusive of Mineral Reserves unless otherwise stated
> There are no Inferred Mineral Resources included in any of the Mineral Reserve estimates
> The Mineral Resource Statements remain, in principle, imprecise and must not be seen as calculations
> Rounding-off of figures may result in minor discrepancies
> All mineral rights are in good standing without any known impediments

Long-term price assumptions

(for more detail see page 25)

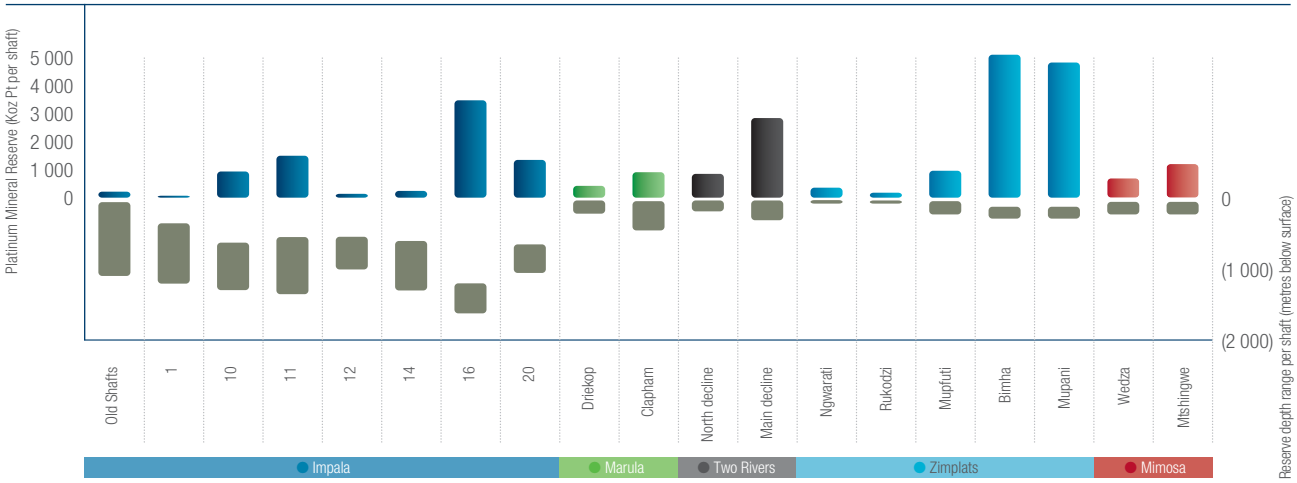
Long-term price assumptions in today's money*

Platinum	US$/oz	**1 040**
Palladium	US$/oz	**1 040**
Rhodium	US$/oz	**2 300**
Ruthenium	US$/oz	**215**
Iridium	US$/oz	**1 020**
Gold	US$/oz	**1 370**
Nickel	US$/t	**13 750**
Copper	US$/t	**7 000**
Exchange rate	R/US$	**13.00**
Basket	US$/Pt oz	**2 100**
	R/Pt oz	**27 300**

** These are long-term assumptions; note that short-term assumptions approximate spot prices.*

The updated allocation of Implats' Mineral Reserves per shaft infrastructure as at 30 June 2018 is depicted in the accompanying graphic illustration. The range below surface and quantum relating to the infrastructure is shown and depicts among others the advantage at Zimplats in this regard, both from a depth and a size perspective. This graph depicts the impact of the Rustenburg review where 1, 12 and 14 Shafts at Impala will cease mining in due course and also gives an indication of the potential impact of a possible further shaft closure in future should prices demand this.

Platinum Mineral Reserve and depth range for individual Implats shafts as at 30 June 2018



Integrated Mineral Resource management

for the year ended 30 June 2018

Implats embraces an integrated Mineral Resources management (MRM) function. To this end, systems, procedures and practices are aligned and are continuously being improved to achieve this objective. MRM includes exploration, geology, geostatistical modelling and evaluation, mine surveying, sampling, mine planning, ore accounting and reconciliation as well as the MRM information systems. The MRM function is the custodian of the mineral assets and specifically strives to optimise these assets – in terms of both Mineral Resources and Mineral Reserves – and to unlock value through a constant search for optimal extraction plans which yield returns in line with the corporate and business objectives.

The main objective of the MRM function is to support the strategic intent and add value to the organisation through:

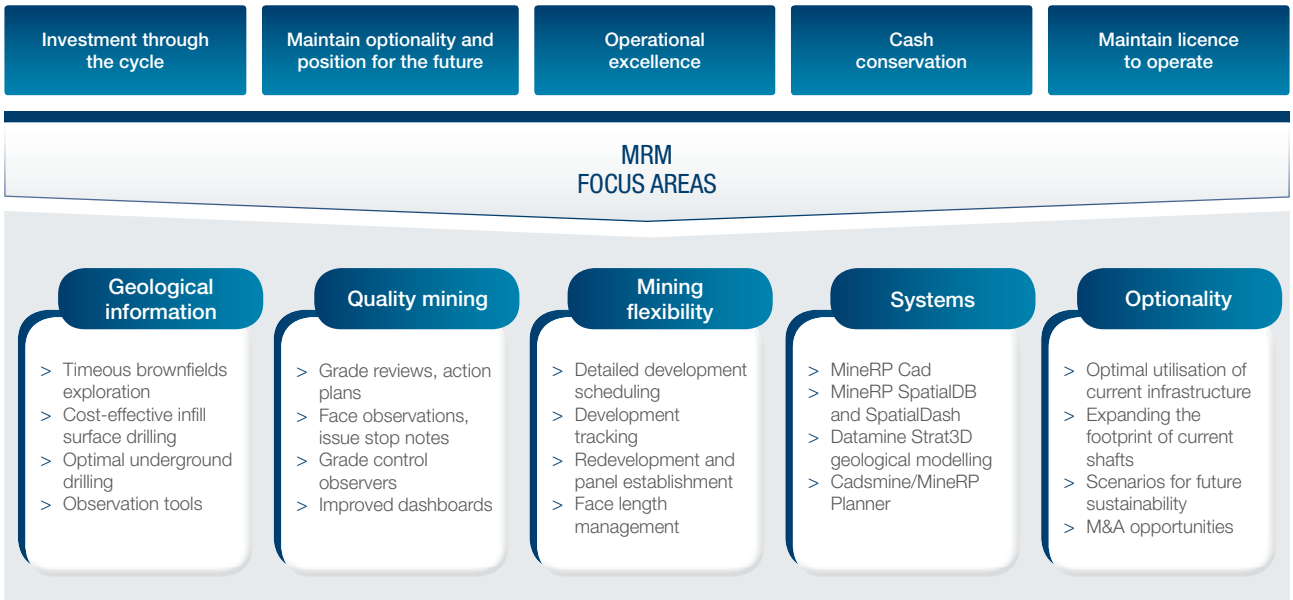
> Safe production is the first principle underpinning all Mineral Reserve estimates
> Appropriate investigation, interpretation and understanding of the orebodies
> Integrated short-, medium- and long-term plans
> Technically appropriate and proven management information systems
> Accurate and reconcilable Mineral Resource and Mineral Reserve estimates
> Seek optimal solutions to ensure sustainable and profitable operations.

Continuous improvement has been embedded in the MRM function. Specific focus is given to new learnings, standardisation and protocols as well as collaboration with the industry.

Present focus areas include:

> Improved Mineral Reserve flexibility, measured as mineable face length in conventional mining sections
> Improvement in the quality of mining
> Revisiting optionality of long-term planning in view of present cash constraints
> Scenario planning for LoM II and III Mineral Resources to ensure a sustainable business model
> Improving the MRM information systems to support mine planning
> Work streams to ensure optionality to sustain operations.

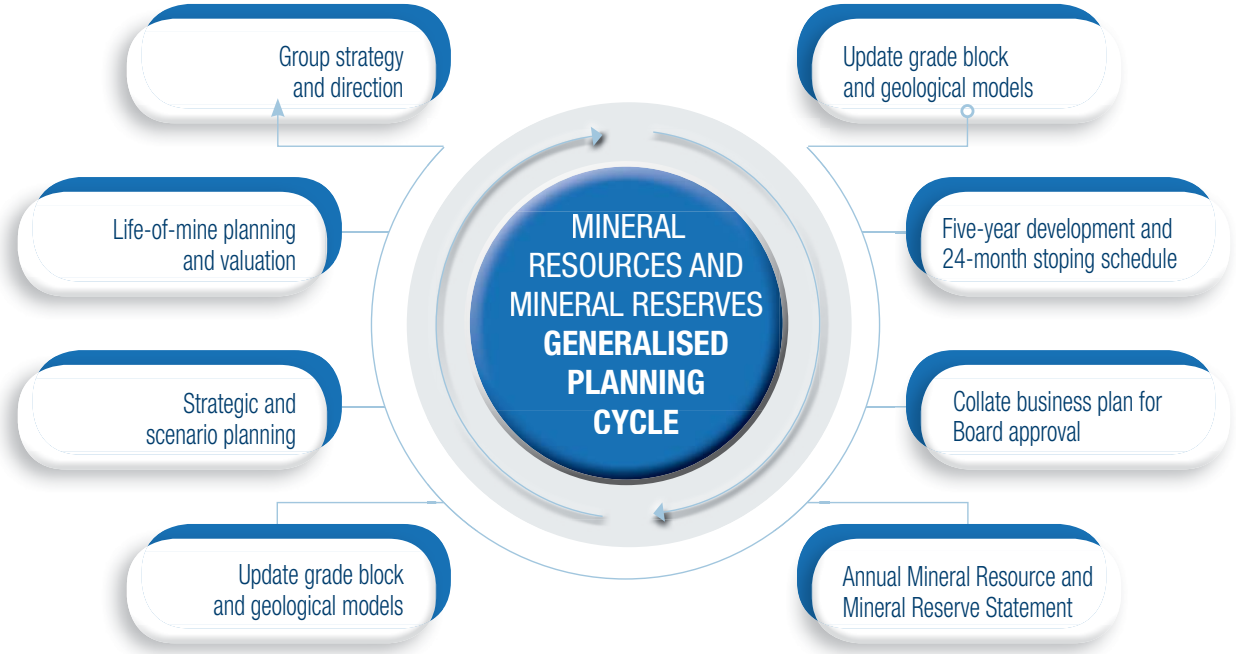
GROUP STRATEGY



Mine planning

The embedded planning cycle gives due consideration to the sequence of planning, the duration of the business planning period and the embedding of long-term strategic planning.

The generalised planning cycle is shown below. It must be noted that rework or new activities are accommodated out of the normal cycle.



Implats has defined three levels of LoM planning, these being classified as Levels III, II and I. The three levels are linked to increasing levels of confidence and the conversion of Mineral Resources to Mineral Reserves.

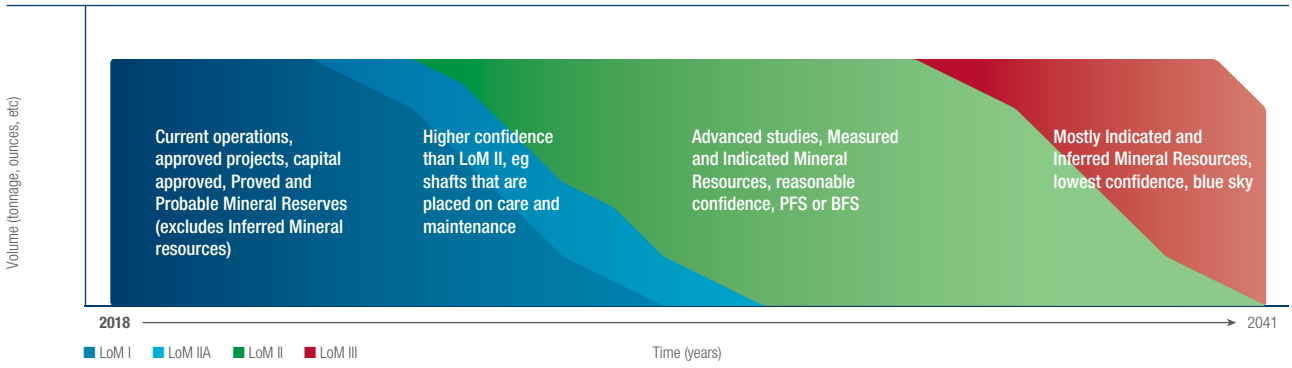
LoM Level III includes 'Blue Sky' and scoping studies and therefore focuses mainly on Inferred Resources and exploration results. It also includes contiguous areas and opportunities outside existing lease boundaries and ownership.

LoM Level II includes planned but as yet unapproved projects, which have a reasonable chance of future Board approval.

LoM Level IIA can be defined as those Mineral Reserves that fail the valuation test of LoM Level I. These uneconomic volumes are removed from LoM I, but are retained as Mineral Resources and not Mineral Reserves. Most of the Mineral Reserves removed through the tail-cutting process fall in the LoM Level IIA category. Likewise, operations that are deemed uneconomic under the current LoM considerations, also fall in this category.

LoM Level I includes operational shafts and approved capital projects where a portion of Mineral Resources is converted to Mineral Reserves and sufficient confidence exists for the declaration of Mineral Reserves in a public report. To this effect no Inferred Mineral Resources are included in LoM I.

LoM levels as at 30 June 2018



Compliance

The reporting of Mineral Resources and Mineral Reserves for Implats' South African operations is undertaken in accordance with the principles and guidelines of the SAMREC Code. SAMREC was established in 1998 and modelled its code on the Australasian Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (JORC Code). The first version of the SAMREC Code was issued in March 2000 and adopted by the JSE in its Listings Requirements later in the same year; this was similarly the basis for the JSE Ongoing Reporting Requirements which were promulgated in 2005. The SAMREC Code has been under review since 2004 and was updated in the 2007 edition and amended in July 2009. The SAMREC Code has been updated in 2016 and this supersedes the previous editions of the code; this was launched on 19 May 2016 at the JSE. Section 12 of the JSE Listings Requirements has been updated and the revised SAMREC and SAMVAL Codes came into effect on 1 January 2017. Zimplats, as an Australian Securities Exchange (ASX) listed company, reports its Mineral Resources and Mineral Reserves in accordance with the 2012 JORC Code. The definitions contained in the SAMREC Code are either identical to or not materially different from the JORC Code. The Zimplats processes, procedures and estimates are reviewed by Implats to ensure that Mineral Resource and Mineral Reserve estimates are fully compliant with the SAMREC Code. Mimosa Investments Limited, a Mauritius-based company, does not fall under any regulatory reporting code, but has adopted the SAMREC Code for its reporting.

The latest edition of the SAMREC Code (the South African Code for the Reporting of Explorations Results, Mineral Resources and Mineral Reserves – the SAMREC Code – 2016 Edition) includes an updated Table 1 template, which provides an extended list of the main criteria that must be considered and reported when reporting on exploration results, Mineral Resources and Mineral Reserves. In the context of complying with the principles of the code, comments relating to the items in the relevant sections of Table 1 must be provided on an 'if not, why not' basis within the Competent Persons' report. The guidelines for the compilation of Table 1 is for (i) the first-time declaration of exploration results, a Mineral Resource or a Mineral Reserve, and (ii) in instances where these items have materially changed from when they were last publicly reported for significant projects. Reporting on an 'if not, why not' basis ensures that it is clear to an investor or other stakeholders whether items have been considered and deemed of low consequence or are not yet addressed or resolved. Implats has adopted the compilation and updating of Table 1 as a standard to complement internal reports.

Concurrent with the evolution of the SAMREC Code, the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) has, since 1994, been working to create a set of standard definitions for the reporting of Mineral Resources and Mineral Reserves. The definitions in the 2016 edition of the SAMREC Code are either identical to, or not materially different from, those existing standard definitions published in the CRIRSCO Reporting Template 2013.

Various Competent Persons (CPs), as defined by the SAMREC and JORC Codes, have contributed to the estimation and summary of the Mineral Resource and Mineral Reserve figures quoted in this report. As such, these statements reflect the estimates as compiled by teams of professional practitioners from the various operations and shafts.

Gerhard Potgieter, Chief Operating Officer, PrEng, ECSA Registration No 20030236, a full-time employee of Implats, takes full responsibility for the Mineral Reserve estimates for the Group. The Competent Person has 33 years' relevant mining experience.

The Group Executive: MRM, Seef Vermaak, PrSciNat, SACNASP Registration No 400015/88, a full-time employee of Implats, assumes responsibility for the Mineral Resource estimates for the Implats Group. He also assumes responsibility for the collation of the combined Mineral Resource and Mineral Reserve Statement for the Group. The Competent Person has 32 years' experience in the exploitation of PGM-bearing deposits.

Implats has written confirmation from the Lead Competent Persons that the information disclosed in terms of this document are compliant with the SAMREC Code and, where applicable, the relevant JSE Section 12 and SAMREC Table 1 requirements, and that it may be published in the form, format and context in which it was intended.

The address for ECSA is:
Engineering Council of South Africa (ECSA),
Private Bag X691, Bruma, 2026, Gauteng province,
South Africa.

The address for SACNASP is:
South African Council for Natural Scientific Professions,
(SACNASP), Private Bag X540, Silverton, 0127,
Gauteng province, South Africa.

Compliance

The contact details of the Lead Competent Persons are as follows:

Gerhard Potgieter
ECSA 20030236, SAIMM
Lead Competent Person
Chief Operating Officer
Impala Platinum Limited
2 Fricker Road
Illovo, 2196
Private Bag X18
Northlands, 2116

13 September 2018

Seef Vermaak
SACNASP 400015/88 GSSA
Lead Competent Person
Group Executive, Mineral Resource Management
Impala Platinum Limited
2 Fricker Road
Illovo, 2196
Private Bag X18
Northlands, 2116

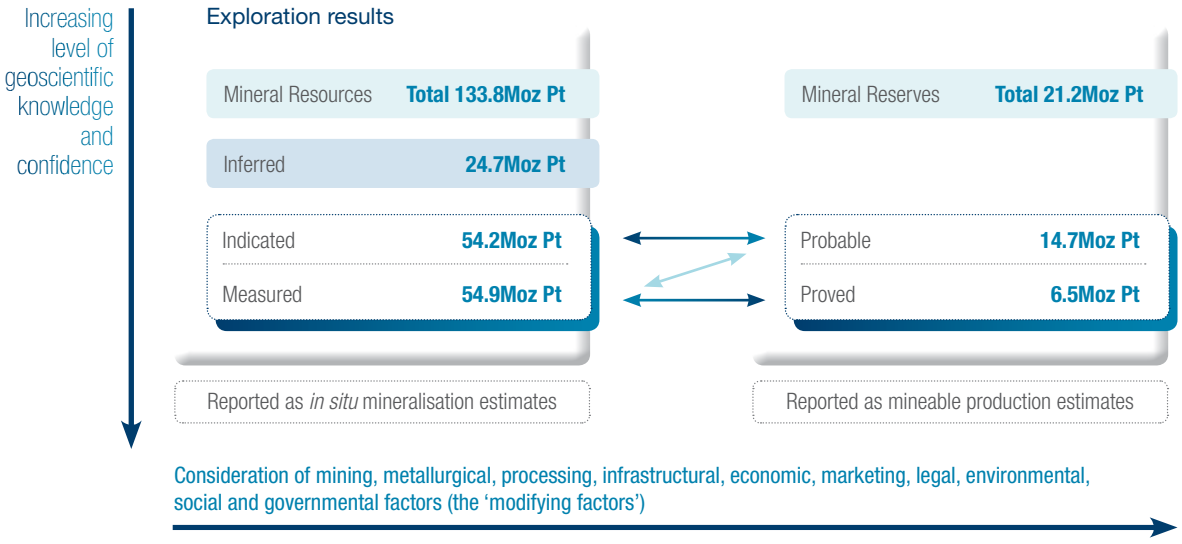
13 September 2018

A Competent Valuator (CV) is a person who is registered with ECSA, SACNASP, or SAGC, or is a Member or Fellow of the SAIMM, the GSSA, SAICA, or a Recognised Professional Organisation (RPO) or other organisations recognised by the SSC on behalf of the JSE. A Competent Valuator is a person who possesses the necessary qualifications, ability and relevant experience in valuing mineral assets. A person called upon to act as a Competent Valuator shall be clearly satisfied in their own mind that they are able to face their peers and demonstrate competence in the valuation undertaken.

Nico Strydom, CA(SA), ACMA, Group strategy and new business development manager, a full-time employee of Implats, takes full responsibility for the valuation of the Mineral Resources and Mineral Reserves for the Group.

The Implats Group's attributable platinum ounces are reflected in the illustration below.

Relationship between exploration results, Mineral Resources and Mineral Reserves showing Implats' attributable Mineral Resources and Mineral Reserves as at 30 June 2018 (Moz Pt)



Compliance

Competent Person (CP) structure 2018

> Lead CP Mineral Resources: Seef Vermaak, Group Executive MRM, (SACNASP 400015/88), GSSA
> Lead CP Mineral Reserves: Gerhard Potgieter, Chief Operating Officer (ECSA 20030236), SAIMM

Competent Person's (CP) name	Appointment	Registration
Philip Fouché	Lead CP exploration	SACNASP, GSSA
Louise Fouché	Lead CP geostatistics and databases	SACNASP, SAIMM, GSSA
Johannes du Plessis	Lead CP audits, reconciliation	SACNASP, GSSA
David Sharpe	Lead CP mine planning, survey and ore accounting	SACNASP, GSSA
Stanley Claassen	Lead CP standards and processes of mine planning	SACNASP
Nico Strydom	Lead CV	SAICA, CIMA

Unit/Project	CP Mineral Resources	Registration	CP Mineral Reserves	Registration
Afplats	Jacolene de Klerk	SACNASP, GSSA	n/a	
Marula	Sifiso Mthethwa	SACNASP, GSSA	Sifiso Mthethwa	SACNASP, GSSA
Zimplats	Steven Duma	AusIMM, SACNASP	Caston Mutevhe	ECSA, SAIMM
Impala	Johannes du Plessis	SACNASP, GSSA	David Sharpe	SACNASP, GSSA
Impala Exploration/ Projects	Philip Fouché	SACNASP, GSSA	n/a	
Two Rivers	Shepherd Kadzviti	SACNASP, GSSA	Mike Cowell	SACNASP, GSSA
Mimosa	Dumisayi Mapundu	SACNASP	Alex Mushonhiwa	SAIMM

In addition to the CPs listed above, the Mineral Reserve Statements are fully supported by an experienced team of general managers, who approve their respective business plans and take full responsibility for their Mineral Reserve Statements. The general managers are:

Name	Area of responsibility	Years' relevant experience
Terence Cowley	General manager Impala 1 Shaft	35
Tshediso Mohase	General manager Impala 9 and 10 Shafts	32
Riaan Swanepoel	General manager Impala 11 Shaft	28
Jacey Kruger	General manager Impala 20 Shaft	28
Joseph Tsiloane	General manager Impala EF, 6 and 12 Shafts	18
André Fryer	General manager Impala 14 Shaft	19
Hans Fourie	General manager Impala 16 Shaft	30
Mogale Mashilane	General manager Marula Mine	26
Alex Mushonhiwa	General manager Mimosa Mine	28
Simbarashe Goto	General manager Ngezi Mine	21
JJ Joubert	General manager Two Rivers Mine	27

Auditing and risk

Implats is committed to independent third-party reviews to provide assurance regarding the Mineral Resource and Mineral Reserve estimates. Furthermore, these reviews assist with the principle of continuous improvement on the set internal processes. The Mineral Corporation was contracted to review and audit the Group's Mineral Resources and Mineral Reserves for three consecutive years. Audits were undertaken in 2016 and 2017 respectively. The main focus areas of the audits was to conduct spot checks of estimates and to link this through to the Mineral Resources and Mineral Reserves, the LoM profiles and the financial valuation of LoM models. They were also tasked to provide guidance in terms of the 2016 SAMREC edition, Table 1 and improvements to the Mineral Resources and Reserves public statement.

In 2018 the scope of the review was to produce a JSE compliant Table 1 report for all Implats' operations. The 2018 review concluded that there are no apparent fatal flaws or material issues identified in the Mineral Resource and Reserve estimation processes and technical modifying factors for the PGM mining operations audited. The review indicated that Mineral Resource and Reserve Statements for Implats' operations as at 30 June 2018 have been compiled and reported following the guidelines of the 2016 editions of the South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (the SAMREC Code) and the 2012 edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the JORC Code). Overall, the processes followed in compiling the estimates and the sign-off procedures fulfil the requirements of Implats' Code of Practice for the Estimation, Classification and Reporting of Mineral Resources and Reserves. The audit noted that the economic viability testing of the LoM plans completed was based on reasonably assumed forward-looking metal price, exchange rate and discount rate assumptions, and realistic production schedules. A statement from The Mineral Corporation is included on page 13.

The Group's reported Mineral Resources and Mineral Reserves represent its estimate of quantities of PGMs that have the potential to be economically mined and refined under anticipated geological and economic conditions. There are numerous uncertainties inherent in estimating quantities of Mineral Resources and Mineral Reserves as well as in projecting potential future rates of metal production, coupled with many factors beyond the Group's control. The accuracy of any Mineral Resources and Mineral Reserves estimate is a function of a number of factors, including the quality of the methodologies employed, the quality and quantity of available data, geological interpretation and judgement. It is also dependent on economic conditions that are in line with estimates. Further, estimates of different geologists and mining engineers may vary and the results of the Group's mining and production – subsequent to the date of an estimate – may lead to a revision of estimates. This can be due to fluctuations in the market price of ores and metals, reduced recovery rates or increased production costs due to inflation or other factors, which may render Mineral Resources and Mineral Reserves containing lower grades of mineralisation uneconomic to exploit and may ultimately result in a restatement of Mineral Resources and/or Mineral Reserves, which could then adversely impact future cash flows. Mineral estimates are based on limited sampling and, consequently, are uncertain as the samples may not be representative of the entire orebody and Mineral Resource. As the understanding of the orebody improves, the estimates may also change. In addition, the Mineral Reserves the Group ultimately exploits may not conform to geological, metallurgical or other expectations and the volume and grade of ore recovered may differ from the estimated levels. It is important to note that Mineral Resources and Mineral Reserves data is not indicative of future production.

Substantial capital expenditure is required to identify and delineate Mineral Resources and Mineral Reserves through geological mapping and drilling, to identify geological features that may prevent or restrict the extraction of ore, to determine the metallurgical processes to extract the metals from the ore and, in the case of new properties, to construct mining and processing facilities.

The MRM department subscribes to a formal risk management process, which endeavours to systematically treat all risks relevant to the Mineral Resources and Mineral Reserves in line with the Implats risk apetite and tolerance framework that is reviewed and signed off by the Board on an annual basis. Currently all of the risks that could affect the Mineral Resources and Mineral Reserves are within accepted risk tolerance levels. Implats recognises that Mineral Resource and Mineral Reserve estimations are based on projections, which may vary as new information becomes available or specifically, if assumptions, modifying factors and market conditions change materially. This approach is consistent with our Group definitions of risk that have been revised in line with the updates published in terms of the International Risk Management Standard, ISO 31000:2018, that being the risk is "the effect of uncertainty on objectives". The assumptions, modifying factors and market conditions therefore represent areas of potential risk. In addition, security of Mineral Right tenure or corporate activity could have a material impact on the future mineral asset inventory, as reflected in the Group and operating entities' top risks' dashboard and disclosures.

Auditing and risk

The Group risk management process is described in detail in the 2018 Implats integrated report.

The key steps in risk management are:
> Identifying of objectives (linked to strategy)
> Establishing the context
> Identifying the risk
> Analysing the risk
> Evaluating the risk
> Treating the risk
> Monitoring and reviewing of the risk
> Reporting of the risk.

During the year under review, we updated our risk assessment proces to the latest requirements of ISO 31000:2018.

Arising from this process we identify a set of objective-based risk assessments that cover the key aspects of the Implats business. Each identified risk, as well as its associated controls, has a clearly defined line management owner. This process culminates in the identification of the prioritised strategic risks. The top Group strategic risks are listed below as these directly impact the Mineral Resources and Mineral Reserves (summarised from the 2018 Implats integrated report):
> Sustained depressed PGM basket prices
> Ability and capacity to implement outcomes of the Rustenburg strategic review and return Impala to cash neutral/positive position by FY2019
> Weak balance sheet
> Sustained depressed PGM basket prices
> Non-delivery of production and productivity target at Impala Rustenburg
> Employee relations climate
> A significant deterioration in safety performance at Impala
> Reduced production flexibility in smelting operations
> Inability to sustain SIB and risk mitigation projects due to capital constraints
> Long-term economic viability of Marula operations
> Challenged capacity and efficiencies of management layers at SA operations.

Similarly, operationally specific risks are listed in each of the sections per individual operation, later in this report.

Surveyor capturing measurements on MineRP Cad at 20 Shaft

Third-party assurance

THE MINERAL CORPORATION

ADVISORS TO THE MINERAL BUSINESS

Mr Seef Vermaak
Group Executive: Mineral Resource Management
Impala Platinum Holdings Limited
No 2 Fricker Road
Illovo
Johannesburg

3 August 2018

Dear Mr Vermaak

RE: IMPLATS GROUP TECHNICAL REVIEW OF MINERAL RESOURCES AND MINERAL RESERVES AT 30 JUNE 2018

The Mineral Corporation has undertaken a technical review of the Impala Platinum Holdings Limited (Implats or Group) Mineral Resource and Mineral Reserve Statement as at 30 June 2018. The Mineral Resource and Mineral Reserve Statement, which consolidates Mineral Resource and Reserve estimates for the various platinum group metal operations owned by Implats in Zimbabwe and South Africa, was prepared by Implats. The operations reviewed are Impala, Marula, Two Rivers, Afplats, and Refineries in South Africa as well as Zimplats and Mimosa in Zimbabwe. The technical review was completed by the Mineral Resource and Mineral Reserve Competent Persons from The Mineral Corporation and supported by in-house Technical Experts.

The undertaking of the technical review followed guidelines of the SAMREC Code. This entailed a systematic and detailed inspection and/or examination of the key elements of the Mineral Resource and Mineral Reserve estimation processes undertaken in order to validate adherence to standards and procedures, and to identify material errors and/or omissions or improvements. In addition, the technical review included detailed examination of the base data that was utilised for the compilation of the Mineral Resource and Mineral Reserve estimates by the different operations. Where relevant, the Technical Experts and Competent Persons visited the operations to validate the base data.

The Mineral Corporation assessed adherence to Implats' policies and procedures as well as guidelines of the 2016 Edition of the SAMREC Code and, in the case of Zimplats, both the SAMREC Code and the 2012 Edition of the JORC Code with respect to the estimation, classification and reporting of Mineral Resource and Mineral Reserve estimates by the various operations. A detailed examination of the input data that was utilised for geological modelling of the platinum group metal bearing reefs, estimation, classification and reporting of Mineral Resource estimates for all the relevant operations was undertaken. In addition, The Mineral Corporation also reviewed the input data that was employed for Business and Life of Mine Planning, Life of Mine Plans, economic viability testing of the Life of Mine Plans as well as the estimation, classification and reporting of Mineral Reserve estimates for all the relevant operations. Finally, The Mineral Corporation reviewed the Group's Mineral Resource and Mineral Reserve Supplement to the Annual Report, 2018.

The Mineral Corporation is satisfied that the implementation of Implats' policies and procedures governing the preparation of Mineral Resource and Mineral Reserve estimates resulted in the reporting of Mineral Resource and Mineral Reserve estimates which are compliant with the 2016 Edition of the SAMREC Code or, in the case of Zimplats, both the SAMREC Code and the 2012 Edition of the JORC Code. No technical fatal flaws or material issues were identified in the technical review of the operations. The Mineral Resource estimates satisfy the SAMREC Code and the JORC Code requirements for reasonable (and realistic) prospects for eventual economic extraction. The Mineral Reserve estimates are based on detailed Life of Mine Plans that have been tested for economic viability under a set of realistically assumed production levels, Modifying Factors and economic inputs. There were no material issues identified in the Consolidated Statements for each operation and for the Group in relation to summation, rounding off and presentation of the estimates.

The Mineral Corporation is satisfied that the Mineral Resource and Mineral Reserves Supplement to the Implats Annual Report reflects the Mineral Resource and Mineral Reserve estimates compiled and that, in itself, it is compliant with respect to the SAMREC Code. This opinion does not imply that The Mineral Corporation has accepted the role of Competent Person for the purpose of the Mineral Resource and Mineral Reserve estimation and sign-off for Implats. Such role resides with the nominated personnel of Implats.

Yours sincerely

CONIACE MADAMOMBE
Director
MSc, BSc (Hons), MBA, Pr.Sci.Nat (400093/08), MGSSA

JOHN MURPHY
Managing Director
BSc (Hons), MBA, Pr.Sci.Nat (400004/94), FGSSA

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DIRECTORS: JE Murphy (Managing), FH Gregory, AH Hart, RA Heins (British), C Madamombe (Zimbabwean), SRQ Nupen

Mineral rights status

Implats continues to embrace the principles of transformation as a moral and strategic imperative to reinforce its position as a leading southern African mining company.

South Africa

The Mineral and Petroleum Resources Development Act, No 28 of 2002 (MPRDA), governing mineral legislation in South Africa, came into effect on 1 May 2004. The MPRDA, with its associated broad-based socio-economic empowerment charter for the mining industry and its attendant scorecard, as revised and amended from time to time, has played a significant role in the transformation of the South African mining industry. The Act effectively transferred ownership of privately held mineral rights to the nation and administered by the state to enable any third party to apply to the Department of Mineral Resources (DMR) for new-order prospecting rights or mining rights over these previously privately held mineral rights. Implats continues to embrace the principles of transformation as a moral and strategic imperative to reinforce its position as a leading southern African mining company.

On 15 June 2018, the draft Mining Charter 2018 was published for public comments to be submitted by 31 August 2018. It is envisaged that the draft Mining Charter 2018 will come into operation within financial year 2019 and will provide for certain transitional periods. The Implats Group will continue to strategically align its business, where economically viable, to comply or exceed all elements of the Mining Charter. Regular compliance audits are conducted by the DMR in respect of the Implats Group's mining and prospecting rights. In March 2018, Implats submitted its annual Mining Charter reports to the DMR for the 2017 calendar year. According to our submissions all three South African mining operations within the Implats Group comply or exceed the 26% BEE ownership requirement based on the recognition of continuing consequences of the past concluded BEE transactions.

The Implats Group undertook a strategic review of its mining and exploration operations at Impala Rustenburg Mine, Marula Platinum Mine and Afplats Leeuwkop project and assessed the outlook going forward, particularly in response to the prevailing market conditions. To this effect:

i. A joint decision was made by the Impala/Royal Bafokeng Resources Joint Venture to exit the prospecting rights on the farms Roodekraalspruit 113 JQ, Klipgatkop 115 JQ, Diepkuil 116 JQ and Doornspruit 84 JQ. These prospecting rights were originally secured as some potential future shafts at Impala would have exploited some of the Mineral Resources underlain by these farms. Effectively all plans to develop such new mining infrastructure have been shelved.
ii. Marula has decided not to proceed with the inclusion of the Hackney prospecting right area into its adjacent converted mining right area and is liaising with the Hackney community and DMR for the community to register a preferential right over the Hackney area in terms of the MPRDA that will enable the community to exploit the Hackney area for its own benefit.
iii. Impala will not continue with its Steelpoortpark exploration project.
iv. Implats has offered its shares in Inkosi Platinum (Pty) Ltd and Imbasa Platinum (Pty) Ltd to its Black Economic Empowerment partner whose companies jointly hold three prospecting rights over various portions of the farms Hartebeestpoort 410 B JQ adjacent to Afplats (Pty) Ltd's Leeuwkop mine project near Brits. The transaction is pending.
v. Impala will continue with its Assegai prospecting right application.

The withdrawal or cancellation of the relevant prospecting rights and/or Section 102 and/or Section 11 applications relating to points i – iii above will be submitted during the course of FY2019, pending the conclusion of discussions/agreements with relevant stakeholders such as Black Economic Empowerment partners, which include:

a. the withdrawal of the Impala Diepkuil prospecting right application which was submitted during the 2016 financial year to secure this JV area (pending the Section 102 and Section 11 approvals to include this JV area into the adjacent Impala converted mining right area).
b. the withdrawal of the Section 102 and Section 11 applications submitted in June 2013 relating to the JV prospecting rights adjacent to the Impala Rustenburg operation, as well as the cancellation of the relevant prospecting rights.
c. the withdrawal of the Section 102 application as submitted in December 2008 to include the Hackney prospecting area into the adjacent Marula converted mining right area, as well as the withdrawal of the Hackney prospecting right renewal application and the cancellation of the Hackney prospecting right.
d. the withdrawal of the Steelpoortpark prospecting right application.

The following applications still require approval by the DMR:

> The Section 102 application to include the Wolvekraal/Kareepoort prospecting right areas into the adjacent Afplats Leeuwkop operation that was submitted in June 2013

Mineral rights status

> The Inkosi prospecting right renewal application that was submitted in May 2010
> The Assegai prospecting right application that was accepted by DMR during 2012

During the course of FY2018, Impala received a closure certificate for its Welbekend prospecting right, which area was included into the adjacent converted mining right of Impala Rustenburg operation.

In 2011, Impala reached agreement with Royal Bafokeng Platinum (RBPlat) to access certain of its mining areas at Bafokeng Rasimone Platinum Mine (BRPM) from 6 and 20 Shafts. This is essentially a royalty agreement which will provide mining flexibility to these shafts. During the past year, the parties have concluded two notarial mining right leases, subject to the Section 11 approval of the Minister of Mineral Resources, which applications will be submitted in early FY2019. These notarial mining right leases will replace the current interim contractorship agreements between the parties, once approved. The Mineral Resources and Mineral Reserves involved are not reflected in this report as the ownership has not been transferred. Fully permitted mining rights are not specified by the SAMREC Code as a prerequisite for the conversion of Mineral Resources to Mineral Reserves. However, Implats is cognisant that a reasonable expectation must exist that such mining rights will be obtained.

Zimbabwe

Since March 2013, the GoZ gazetted several notices to acquire the land north of Portal 10 at Zimplats. On 13 January 2017 the GoZ again issued, through a Government Gazette Extraordinary, a preliminary notice in terms of which it had given fresh notice of its intention to compulsorily acquire land measuring 27 948 hectares within Zimplats' mining lease area. This notice repealed all previous notices issued by the GoZ in respect to its proposed compulsory acquisition of this portion of Zimplats' mining lease area. Papers opposing the application were filed on behalf of Zimplats Holdings Limited and Zimplats.

Zimplats announced on 6 June 2018 that the issue concerning the proposed compulsory acquisition of a portion of Zimplats' mining lease area, as well as the issue of security of Zimplats' mining tenure, have been resolved amicably between Zimplats, through the operating subsidiary, and the government to the mutual benefit of the parties. Zimplats agreed to release to the government land measuring 23 903 hectares within Zimplats' mining lease area in support of the government's efforts to enable participation by other investors in the platinum mining industry in Zimbabwe.

Following this release of land, Zimplats now holds two separate and non-contiguous pieces of land measuring in aggregate 24 632 hectares. Consequently, the operating subsidiary applied for and was granted with effect from 31 May 2018, two separate mining leases over the two pieces of land measuring 6 605 hectares and 18 027 hectares respectively. These mining leases replace the special mining lease which was due for renewal in August 2019. The two mining leases issued to the operating subsidiary are valid for the life-of-mine of Zimplats' mining operations and they secure the operating subsidiary's mining tenure.

This arrangement whereby Zimplats released a large portion of land north of Portal 10 had a material impact on the Mineral Resource estimate, the details of which are described in the Mineral Resources estimation section.

Implats undertook a strategic review of its mining and exploration operations at Impala Rustenburg Mine, Marula Platinum Mine and Afplats Leeuwkop project and assessed the outlook going forward, particularly in response to the prevailing market conditions. To this effect the Implats Board resolved to exit certain prospecting rights in support of the objectives of the MPRDA.

South Africa	Implats' interest %	Mining right (ha)	Prospecting right (ha)
Impala	96%	29 773	
Afplats	74%	4 602	1 065
Marula	73%	5 494	
Two Rivers	46%	11 349	

Zimbabwe	Implats' interest %	Mining leases (ha)
Zimplats	87%	24 632
Mimosa	50%	6 594

Regional geological settings

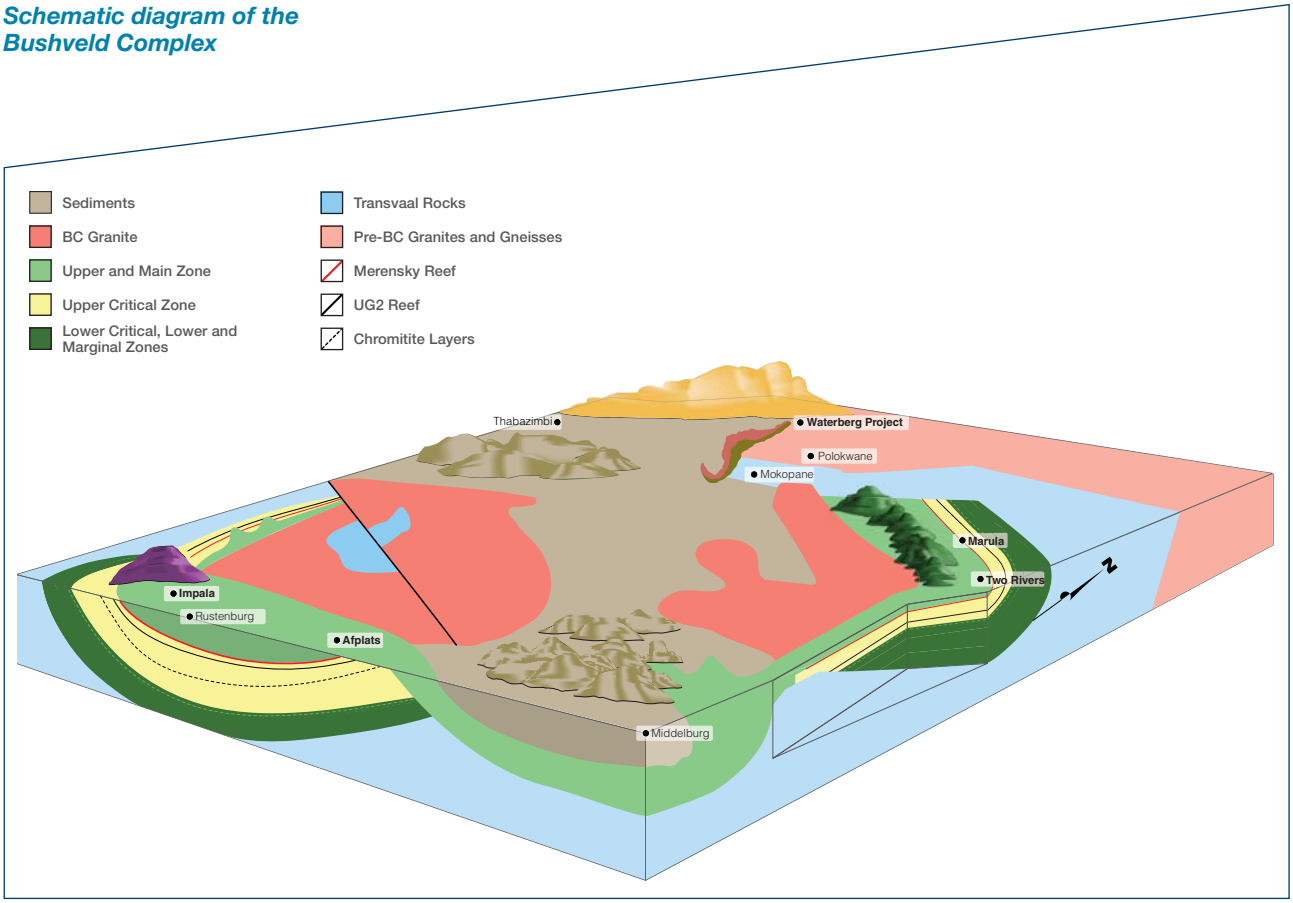
PGMs ARE A VERY RARE COMMODITY – ONLY SOME 500 TONNES (EXCLUDING RECYCLING) ARE PRODUCED ANNUALLY, OF WHICH LESS THAN 230 TONNES ARE PLATINUM – YET THEY PLAY A PROGRESSIVELY MORE IMPORTANT ROLE IN EVERYDAY LIFE, SUCH AS IN AUTOCATALYSTS TO CONTROL VEHICLE EMISSIONS, IN THE PRODUCTION OF LCD GLASS AND AS HARDENERS IN DENTAL ALLOY. PGMs USUALLY OCCUR IN ASSOCIATION WITH NICKEL, COPPER AND CHROMIUM.

Implats exploits platiniferous horizons within the Bushveld Complex (BC) in South Africa and the Great Dyke in Zimbabwe. These two layered intrusions are unique in terms of size and geological continuity. Mining mostly takes place as underground operations focusing on relatively narrow mineralised horizons, with specific mining methods adapted to suit the local geology and morphology of the mineralised horizons.

The Bushveld Complex

The Bushveld Complex is an extremely large (65 000km^2), two billion-year-old layered igneous intrusion occurring in the northern part of South Africa. Rock types range in composition from ultramafic to felsic. The complex is not only unique in size, but also in the range and economic significance of its contained mineral wealth. In addition to the PGMs and associated base metals, vast quantities of chromium, vanadium, tin, fluorine and dimension stone are also produced.

Schematic diagram of the Bushveld Complex



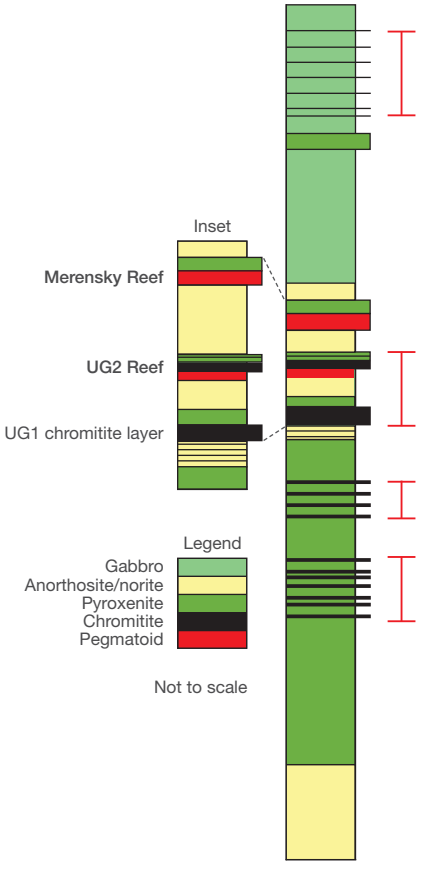
Regional geological settings

The accompanying map (page 18) and schematic diagram (page 16) show the extent of the Bushveld Complex. The layered sequence, the Rustenburg Layered Suite, comprises five major sub-divisions. These are, from the bottom upwards, the marginal, lower, critical, main and upper zones as indicated in the generalised stratigraphic column below. Three horizons within the critical zone, namely the Merensky Reef, the Upper Group 2 (UG2) Reef and the Plat Reef, host extensive economically exploitable quantities of PGMs. Two of these horizons, which can be traced for hundreds of kilometres around the complex, are the focus of the current Implats' operations. The PGMs – platinum, palladium, rhodium, ruthenium and iridium – as well as the associated gold, copper, nickel, cobalt, chromium and other minor metals and compounds, are mined concurrently, but recovered by different processes.

Chromitite layers present below the UG2 Reef contain little to no PGM mineralisation and are mined by other operators for their chromium content. The economic potential of the Waterberg PGM deposit at the northern extremity of the Northern Limb has become a focus for project studies in recent years. There are two PGE-Cu-Ni-Au mineralised intervals in the Waterberg deposit, a lower F zone and an upper T zone.

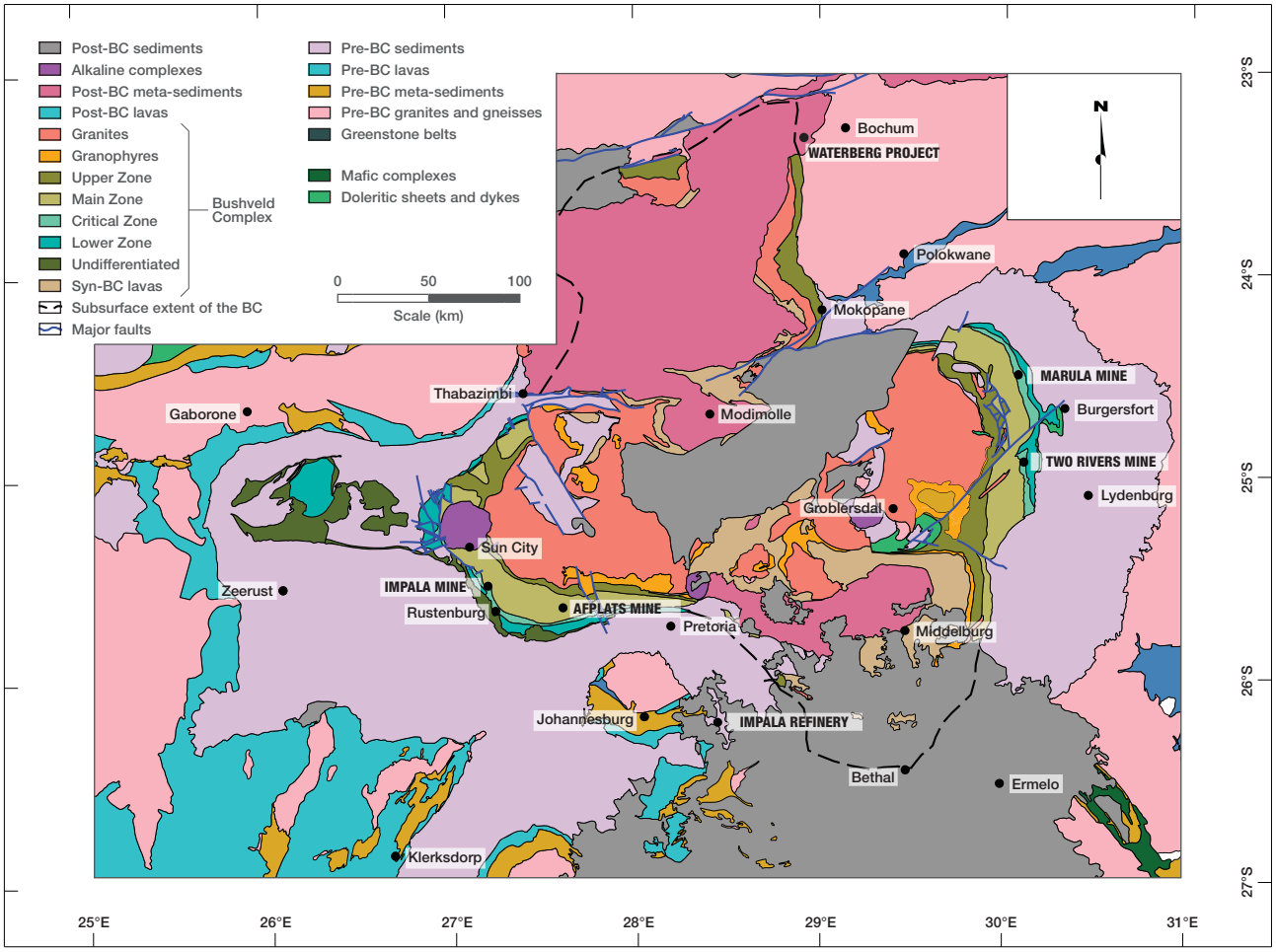
Implats' operations on the Bushveld Complex comprise Impala Mine north of Rustenburg, Marula Mine northwest of Burgersfort and the Two Rivers Mine, a joint venture between Implats and African Rainbow Minerals Limited (ARM) situated southwest of Steelpoort. The Afplats Leeuwkop project is situated in the western limb of the Bushveld Complex, west of Brits. Implats acquired a 15% interest in the Waterberg Joint Venture project during the course of 2017.

Generalised stratigraphic column of the Bushveld Complex



	Sub-division	Main rock type
Magnetite layers	UPPER ZONE	Anorthosite Gabbro Olivine diorite Magnetite
Pyroxenite marker	MAIN ZONE	Anorthosite Gabbro Norite Pyroxenite
Merensky Reef		
Upper group chromitites	UPPER CRITICAL ZONE	Anorthosite Norite Pyroxenite Chromitite
Middle group chromitites		
Lower group chromitites	LOWER CRITICAL ZONE	Pyroxenite Chromitite Harzburgite Dunite
	LOWER ZONE	Pyroxenite Harzburgite Dunite
	MARGINAL ZONE	Norite

Regional geological settings



Simplified map of the Bushveld Complex and surrounding rocks

Surface drilling near 16 Shaft, Impala

Regional geological settings

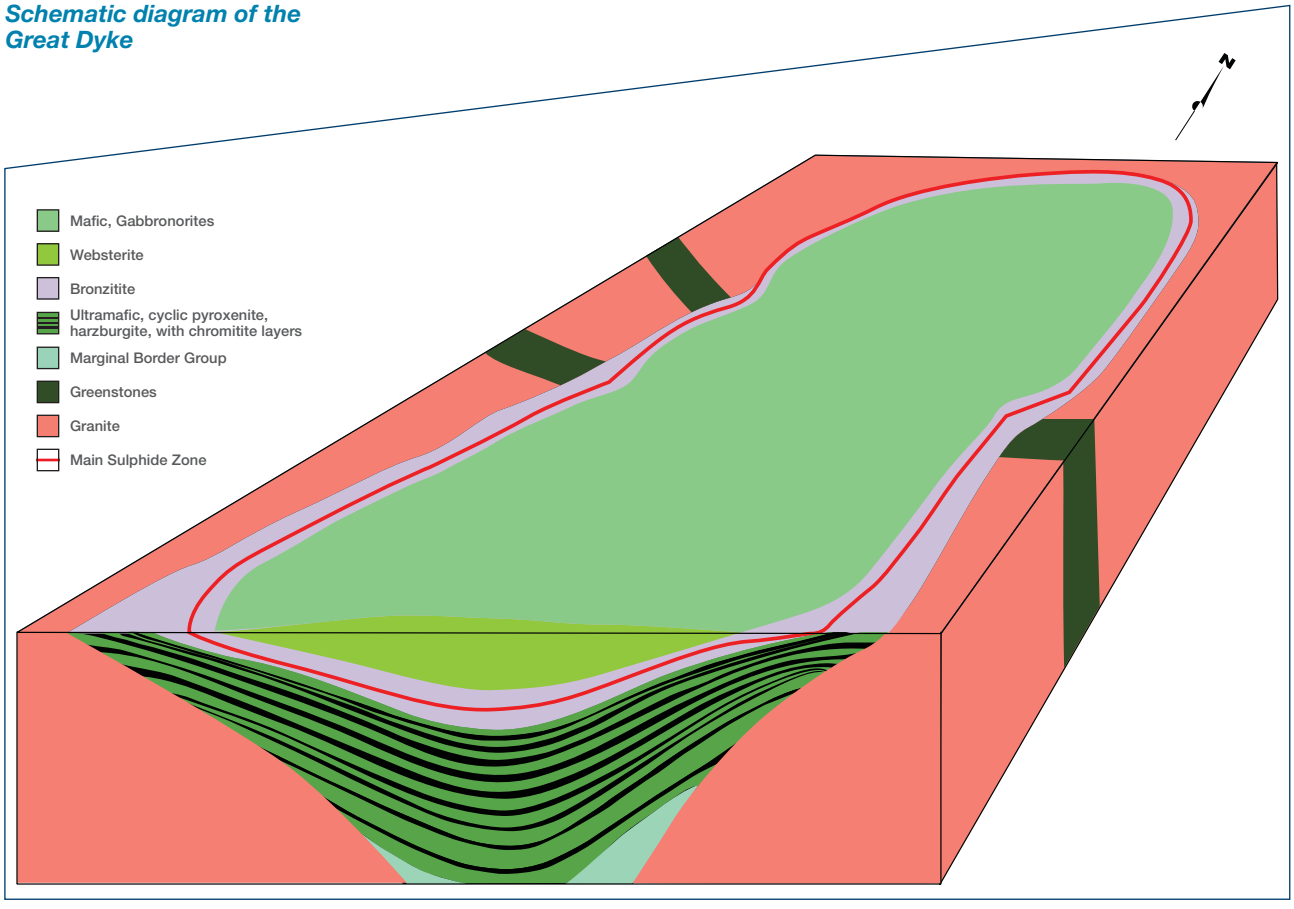
A detailed geological description of the various reef types is provided in the relevant operational sections. It is clear that the grade distribution varies materially from area to area. The UG2 Reef morphology and associated vertical grade distribution also differs significantly between regions (see above), specifically in terms of the width of the main platinum bearing chromitite layer and in the number of layers. In general the grade increases if the chromitite layer width becomes thinner.

The Great Dyke

The Great Dyke is a 2.5 billion-year-old layered mafic-ultramafic body intruded into Archaean granites and greenstone belts. It is highly elongated, slightly sinuous, 550km long, north-northeast trending with a maximum width of 12km. It bisects Zimbabwe in a north-northeasterly trend and is divided vertically into a lower ultramafic sequence, comprising cyclic repetitions of pyroxenite, harzburgite, dunite and chromitite, and an upper mafic sequence consisting mainly of norite, gabbronorite and olivine gabbro. The accompanying schematic diagram and map show the extent of the Great Dyke. It is U-shaped in section with layers dipping and flattening towards the axis of the intrusion. Much of the mafic sequence has been removed by erosion and at the present plane of erosion the Dyke is exposed as a series of narrow, contiguous layered complexes or chambers. These are, from north to south, Musengezi, Hartley (comprising the Darwendale and Sebakwe sub-chambers) and a southern chamber (comprising the Selukwe and Wedza sub-chambers).

The Main Sulphide Zone (MSZ), host to economically exploitable PGMs and associated base metal mineralisation, is located 10m to 50m below the ultramafic/mafic contact in the P1 pyroxenite. The PGMs, along with gold, copper and nickel, occur in the MSZ. A detailed description of the MSZ and the value distributions is provided in the relevant operations sections. Examples comparing different areas indicate that the grade profiles vary between areas and that the platinum and palladium peaks are somewhat offset. Typically, the MSZ consists of a 2m to 10m-thick zone containing 2% to 8% of iron-nickel-copper sulphides disseminated in pyroxenite. The base of this nickel-copper-rich layer is straddled by a 1m to 5m-thick zone of elevated precious metals (Pt, Pd, Rh and Au). The base metal zone contains up to 5% sulphides, while the sulphide content of the PGM zone is less than 0.5%. This change in sulphide content is related to the metal distribution in a consistent manner and is used as a mining marker. It can normally be located visually in borehole core and with careful observation it can also be visually identified underground, therefore careful monitoring supported by channel sampling and XRF scanning is required to guide mining.

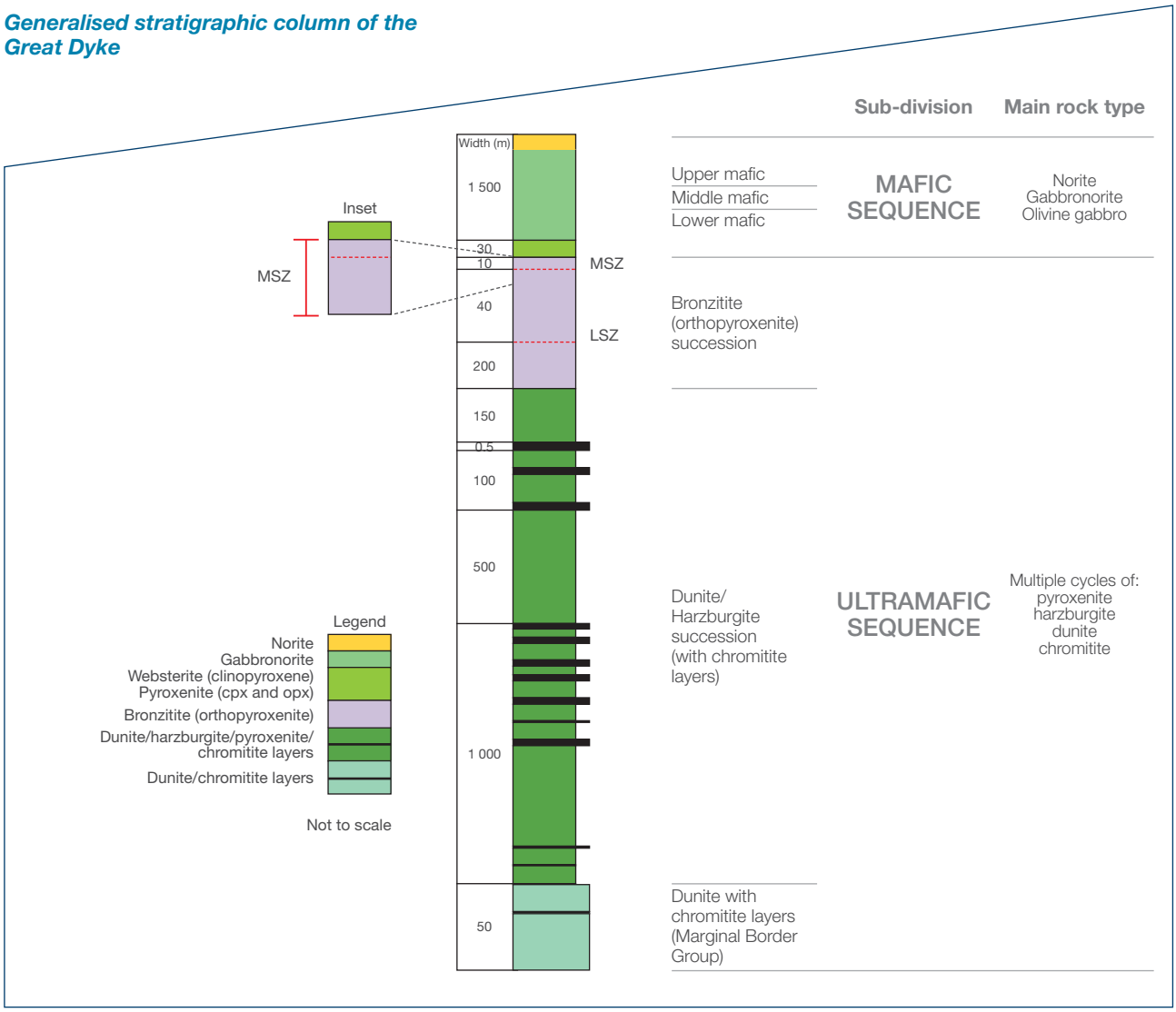
Schematic diagram of the Great Dyke



Regional geological settings

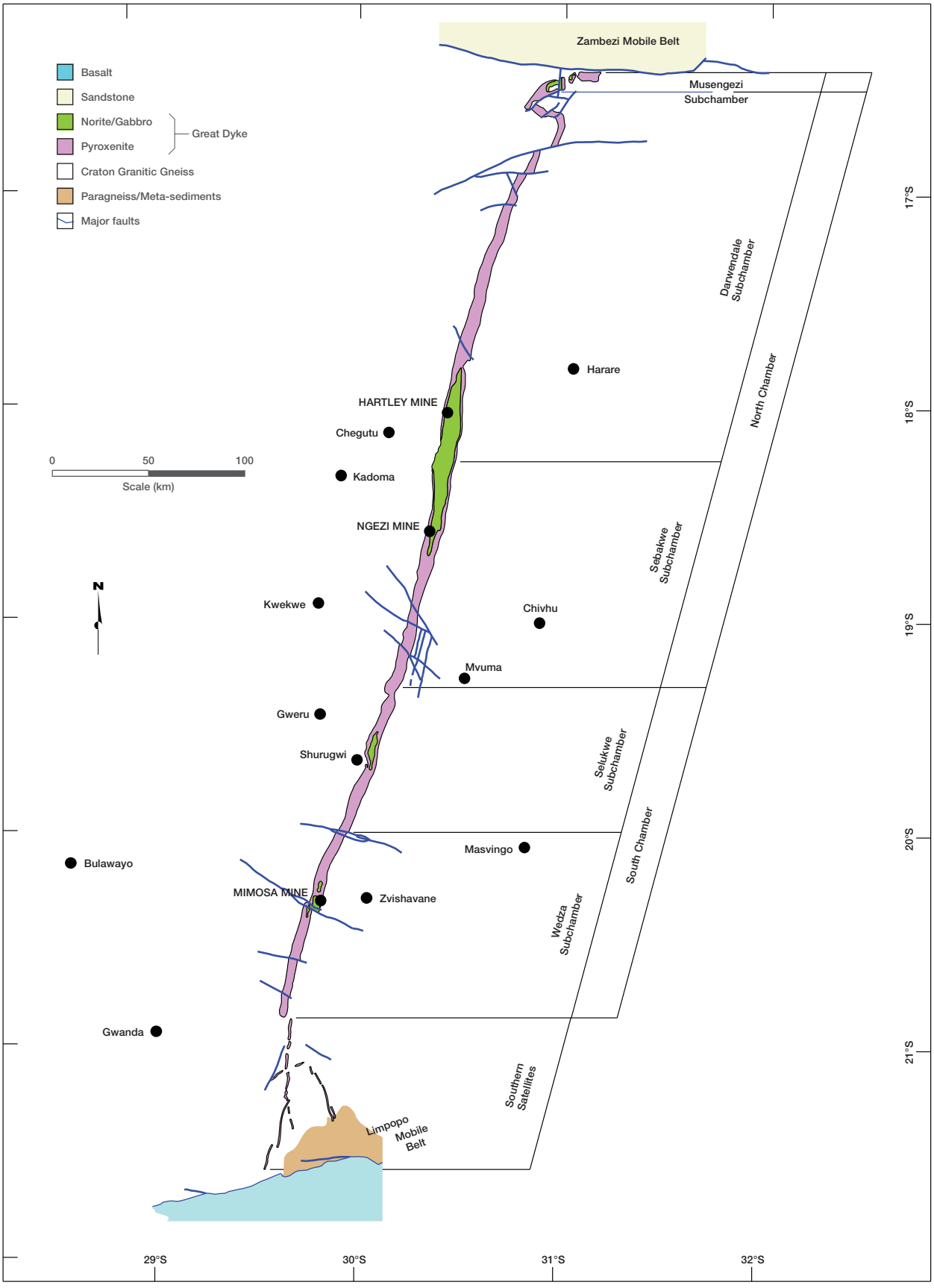
Chromitite layers present below the MSZ contain little to no PGM mineralisation and are mined by other operators for their chromium content only. Implats' operations on the Great Dyke comprise Zimplats' Ngezi Mine southwest of Harare and the Mimosa Mine, a joint venture between Implats and Sibanye-Stillwater situated east of Bulawayo.

Generalised stratigraphic column of the Great Dyke



Planning meeting at 20 Shaft, Impala

Regional geological settings



Simplified map of the Great Dyke

Exploration review

Given the constrained economic situation of the past few years in the platinum industry, Implats' exploration focus is being limited to current operations. The Group exploration strategy remains unchanged in so far as the main focus is brownfields activities in support of ongoing mining at existing operations. In general, surface borehole spacing during feasibility studies are 500m or greater apart and infill drilling is required on an ongoing basis to better define geological structures, specific local complexities, ground conditions and grade variations to inform mine planning and direct medium-term layouts. The target remains to gather information to direct the five-year Mineral Reserve development plans. As such, brownfields exploration plans are annually revisited and subjected to scrutiny at various management levels in order to ensure that the Group imperative of cash conservation is honoured but at the same time to support optimal mine layouts.

Annual Group exploration expenditure from surface as well as underground operations for the past year amounted to some R143 million. It is projected that 2019 will see similar levels of exploration expenses.

	Surface drilling			Underground drilling			Geotechnical drilling		
	Total (n)	Length (m)	Amount (R'000)	Total (n)	Length (m)	Amount (R'000)	Total (n)	Length (m)	Amount (R'000)
Impala	13	14 810	22 080	959	47 861	58 560	–	–	–
Marula	2	962	854	111	3 959	2 370	–	–	–
Two Rivers	17	10 269	11 730	119	9 520	5 080	–	–	–
Zimplats*	75	24 197	25 517	87	8 900	7 927	8	1 500	1 164
Mimosa*	13	2 585	4 295	23	3 388	2 087	4	740	932
Afplats	–	–	–	–	–	–	–	–	–
Total	**120**	**52 823**	**64 476**	**1 299**	**73 628**	**76 024**	**12**	**2 240**	**2 096**

** R13.69 per US dollar (as at 30 June 2018).*

Details pertaining to the ongoing brownfields exploration are described in individual sections per operation

Significant exploration activities were undertaken at the Waterberg Joint Venture Project, a total of 86 surface boreholes were drilled to complete resource models since Implats concluded the joint venture agreement in 2017. Metallurgical test work, airborne geophysics and geotechnical logging and sampling were completed.

Offshore projects

The Sunday Lake Project in Ontario, Canada is 100% funded by North American Palladium under the earn-in option agreement concluded with Implats in 2017. During the past year significant, encouraging results have been obtained with several intersections of >30m in width and in excess of 3g/t PGEs. Some CAD$3 million was incurred by North American Palladium. Future work will entail geophysical surveys prior to planning the next drilling phase.

Implats continues to monitor PGM exploration worldwide to maintain intelligence concerning resource developments and exploration opportunities.

Geologist measuring underground borehole core

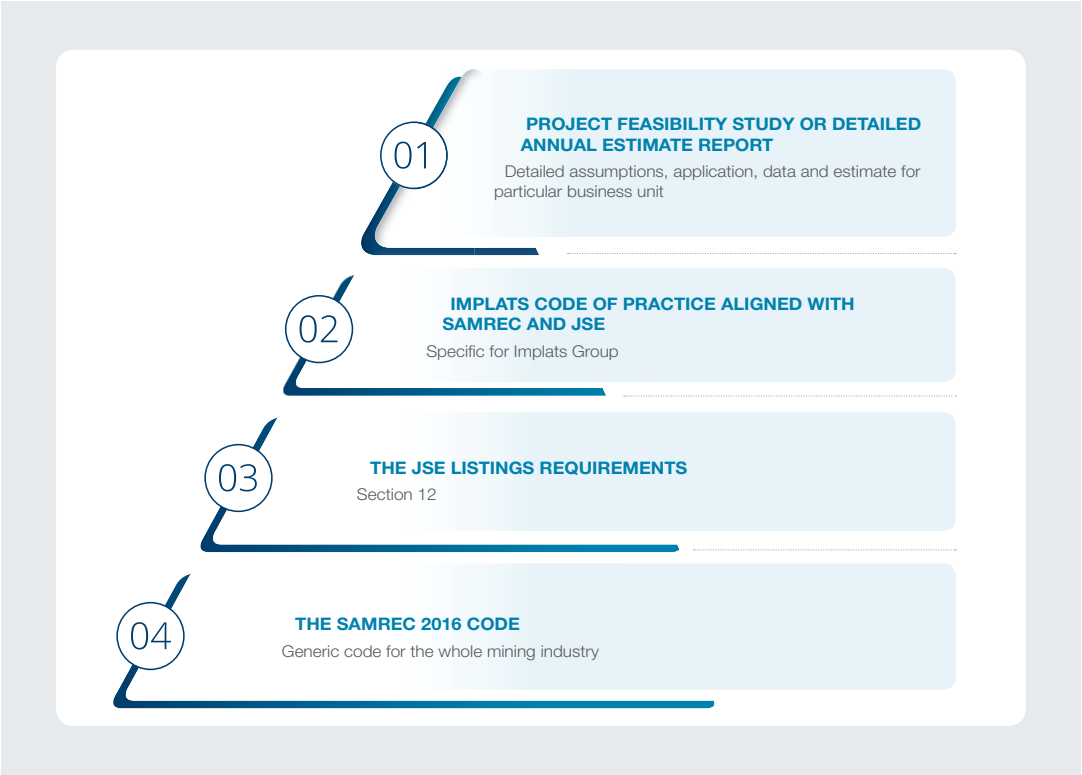
Relevant assessment and reporting criteria

The following key assumptions and parameters, unless otherwise stated, were used in the compilation of the estimates in this declaration:

> A Group-wide committee, the Implats Resource and Reserve Committee (IRRC), was constituted in 2009 with the objective of promoting standardisation, compliant and transparent reporting, continuous improvement and internal peer reviews. The committee meets quarterly with representatives from the various operations and MRM disciplines. As a result, Implats developed a Group-wide protocol for the estimation, classification and reporting of Mineral Resources and Mineral Reserves in 2010 to enhance standardisation and to facilitate consistency in auditing. This protocol is updated annually with the aim of improving and specifically guiding the classification of Mineral Resources and to ensure compliance with the SAMREC Code.

> While Zimplats complies to the JORC Code, the definitions are either identical or do not vary materially from the SAMREC Code. This report is compiled in compliance to the guidelines and principles of the SAMREC Code and the JSE Listings Requirements.

STRUCTURAL HIERARCHY OF PRINCIPLES, REQUIREMENTS, STANDARDS, ASSUMPTIONS AND ESTIMATES



> A key aspect of the Group-wide protocol determines the standards for classification of Mineral Resources. The classification standard is a matrix process and measures both geological and grade continuity between points of observation

> Mineral Resource and Mineral Reserve evaluation is based on a systematic process of collecting and validating geological data as depicted in the Group-wide protocol. Updating of geological and geostatistical models with data from exploration and underground drilling, mapping and sampling forms the basis of the Mineral Resource and Mineral Reserve Statements

> Quality, distribution and quantity of available data and the confidence thereof forms the basis of the Mineral Resource classification

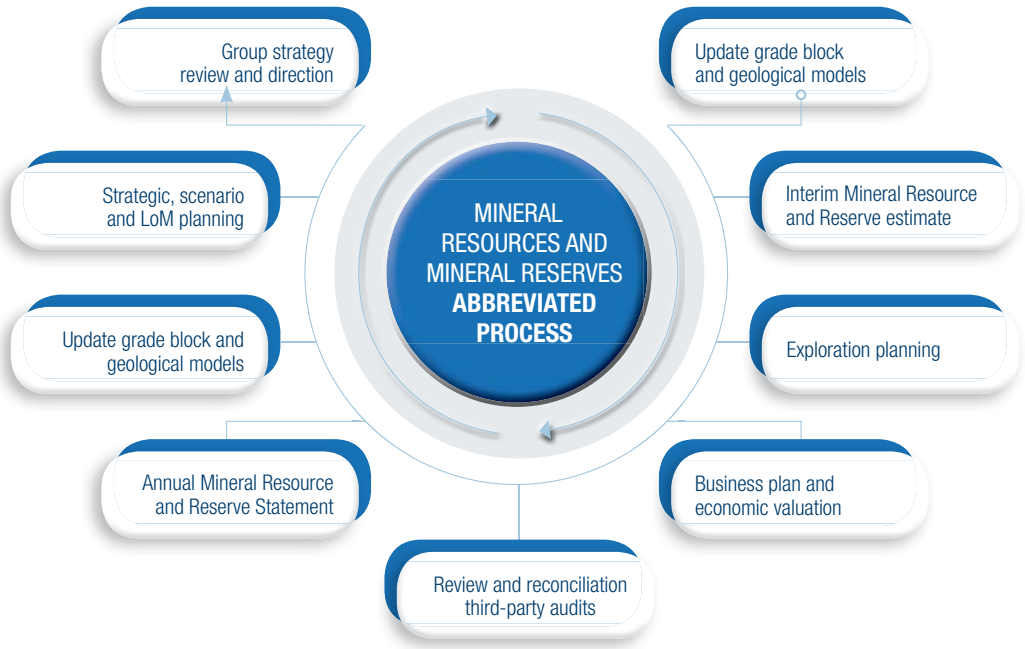
> Geostatistical estimation is done using different geostatistical software packages within the Implats Group. Different interpolation methods and geostatistical parameters are used depending on the orebody and sampling density. Ordinary kriging and inverse distance weighting are the primary interpolation methods used within the Implats Group

> Implats introduced a depth cut-off in 2010 whereby mineralisation below a certain depth is excluded from the Mineral Resource estimate. The depth cut-off of 2 350m was applied during the 2013 Implats Mineral Resource estimates and equated to a VRT of 73°C. A depth cut-off of 2 000m below surface was introduced in 2014. In addition to the new depth cut-off areas, various Mineral Resource blocks are considered on a case-by-case basis and this has resulted in areas where the eventual economic extraction is in doubt. These areas are excluded from the summation of total Mineral Resources per area and the attributable Mineral Resources (see page 27)

> Mineral Resource tonnage and grades are estimated *in situ*. The Mineral Resources for the Merensky Reef are estimated at a minimum mining width, and may therefore include mineralisation below the selected cut-off grade. Mineral Resource estimates for the UG2 Reef reflect the minimum mineable width and may include dilution

Relevant assessment and reporting criteria

- Mineral Resource estimates for the Main Sulphide Zone are based on optimal mining widths. Such mining widths are reviewed from time to time given varying economic and operational considerations
- Mineral Resource estimates are reported inclusive of Mineral Reserves, unless otherwise stated
- Mineral Resource estimates allow for estimated geological losses but not for anticipated pillar losses during eventual mining, except where these pillars will never be extracted, such as legal, boundary and shaft pillars
- Mineral Reserve estimates include allowances for mining dilution and are reported as tonnage and grade delivered to the mill
- Mineral Reserve estimates take cognisance of all mine stability pillars and the content associated with pillars are excluded
- Rounding-off of figures in the accompanying summary estimates may result in minor computational discrepancies. Where this occurs it is not deemed significant
- It is important to note that the Mineral Resource Statements, in principle, remain imprecise estimates and cannot be referred to as calculations. All Inferred Mineral Resources should be read as 'approximations'
- Exploration samples are mainly assayed for all PGEs and Au, using the nickel sulphide fire assay collection method and determining the elements with an inductively coupled plasma mass spectrometer (ICP-MS). Base metal content is determined by an atomic absorption (AA) spectrometer using partial digestion in order to state metal in sulphide that is amenable to recovery by flotation processes. All these analyses are undertaken by Intertek via their preparatory branch in Bapsfontein
- Underground samples are mainly assayed for Pt, Pd, Rh and Au using the lead collection method by the in-house laboratories at the respective mines. A partial digestion at the in-house laboratories is used to determine the base metal content of samples using AA
- All references to tonnage are to the metric unit
- All references to ounces (oz) are troy with the factor used being 31.10348 metric grams per ounce
- The Mineral Resources and Mineral Reserves reported for the individual operations and projects are reflected as the total estimate (100%). The corresponding estimates relating to attributable Mineral Resources and Mineral Reserves are only given as combined summary tabulations
- Mineral Reserves are that portion of the Mineral Resource which technical and economic studies have demonstrated can justify extraction at the time of disclosure. Historically, Implats has only converted Mineral Resources to Mineral Reserves on completion of a full feasibility study for a project with Board approval of the full project capital and LoM I for an operating mine (as per SAMREC). The conversion of Mineral Resources to Mineral Reserves for Zimplats has been aligned to the Implats standard since 2014
- The work processes and flow are fully integrated with the planning cycle and a structured approach has been adopted with activities aligned in a continuous sequence. The simplified cycle is illustrated below:



Relevant assessment and reporting criteria

> No Inferred Mineral Resources have been converted into Mineral Reserves at any of the Implats' operations reported. According to the SAMREC Code, Inferred Mineral Resources may be included in mine design, mine planning and economic studies only if a mine plan exists. SAMREC requires that a comparison of the results with and without the Inferred Mineral Resources must be shown and the rationale behind including it must be explained
> There are only limited changes in the estimation principles and reporting style as at 30 June 2018 relative to the previous report
> The term Ore Reserve is interchangeable with the term Mineral Reserve
> Implats uses a discounted cash flow model that embodies economic, financial and production estimates in the valuation of mineral assets. Forecasts of key inputs are:
  – Relative rates of inflation in South Africa and the United States
  – Rand/Dollar exchange rate
  – Metal prices
  – Capital expenditure
  – Operating expenditure
  – Production profile
  – Metal recoveries
> The outputs are net present value, the internal rate of return, annual free cash flow, project payback period and funding requirements. Metal price and exchange rate forecasts are regularly updated by the marketing department of Implats. As at 30 June 2018, a real long-term forecast for PGM basket revenue per platinum ounce sold of R27 300 was used. Specific real long-term forecasts in today's money include:

Platinum	US$/oz	**1 040**
Palladium	US$/oz	**1 040**
Rhodium	US$/oz	**2 300**
Ruthenium	US$/oz	**215**
Iridium	US$/oz	**1 020**
Gold	US$/oz	**1 370**
Nickel	US$/t	**13 750**
Copper	US$ t	**7 000**
Exchange rate	R/US$	**13.00**

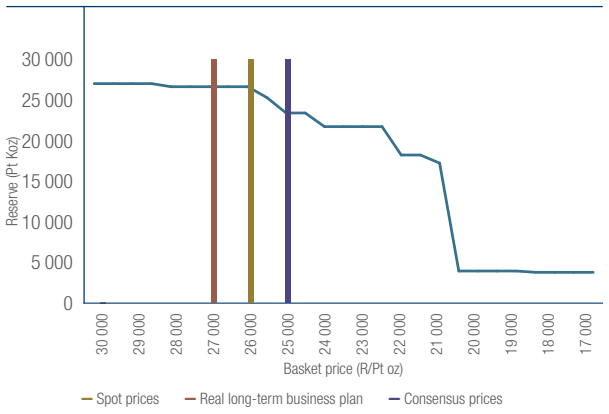
> The spot basket price calculated for Implats at a Group level as at 30 June 2018 was R26 091 and the equivalent real long-term market consensus basket price is R25 130 (US$1 860) per ounce
> The long-term market consensus metal price estimates are the mean of 19 broker companies real term metal price estimates over the next three to five years
> Long-term basket price forecasts per operation vary in accordance with the PGM metal ratios
> Rigorous profitability tests are conducted to test the viability of the Mineral Reserves, references to this are listed in the sections per operation and highlight the spot price scenarios. A summary graph showing the price sensitivity of the total Group Mineral Reserves is depicted on the right.

An economic profitability test was conducted at each shaft. At Impala and Marula so-called tail-cutting tests were performed. The process entails the determination of when a shaft is no longer profitable and no longer contributes to fixed overheads. Each shaft's processing, services and other costs are split between their relevant fixed and variable portions. Once a shaft is no longer profitable (or contributing to fixed overheads), it is removed from the LoM I profile (and Mineral Reserves) and the fixed costs apportioned to the shaft are then allocated over to the other shafts that remain operational.

Mineral Resource, by definition, is 'a concentration or occurrence of solid material of economic interest in or on the earth's crust in such form, grade, quality and quantity that there are reasonable and realistic prospects for eventual economic extraction'. The interpretation of such 'eventual economics' varies significantly. However, it implies some form of high-level view in terms of either 'yard-stick comparisons' or high-level scenario models. On this basis Implats has excluded significant mineralisation (2 000m below surface, and selected areas based on geology and potential infrastructure (see section 'Areas excluded from Mineral Resource estimates'). In total some 42Moz Pt have been excluded from current statements on this basis. However, under the present price regime and outlook, the bulk of Implats' South African Mineral Resources are marginal at best and require long-term metal prices higher than current estimates.

The deeper Rustenburg Mineral Resources beyond current infrastructure investment require a real basket price of between R31 000 and R34 000 per Pt oz (US$2 500). This suggests that future investments at Impala will at best be marginal under the current price assumptions. Notably, the Zimbabwean Mineral Resources are reasonably robust in terms of 'eventual economic extraction'. Mineral Resources beyond current infrastructure investment will require a real long-term basket price in the order of R31 000 per Pt oz (US$2 350).

Implats Mineral Reserves versus real basket price as at 30 June 2018



The environment

Implats has an environmental policy that commits the Company to conducting its exploration, mining, processing and refining operations in an environmentally responsible manner and to ensure the well-being of its stakeholders.

Our activities associated with the exploration, extraction and processing of Mineral Resources result in the unavoidable disturbance of land, the consumption of resources and the generation of waste and atmospheric and water pollutants. Growing regulatory and social pressure, increasing demands for limited natural resources and the changing costs of energy and water all highlight the business imperative of responsible environmental management, particularly as our underground operations become deeper and consume more energy and water. This involves taking measures to address security of resource supply (for example through efficiency, recycling and fuel-switching) and to actively minimise our impacts on natural resources and on the communities around our operations. These measures have direct benefits in terms of reduced costs and liabilities, enhanced resource security and the improved security of our licence to operate.

Implats has an environmental policy that commits the Company to conducting its exploration, mining, processing and refining operations in an environmentally responsible manner and to ensure the well-being of its stakeholders. The policy also commits to integrating environmental management into all aspects of the business with the aim of achieving world-class environmental performance in a sustainable manner.

Our management of the environmental impacts of our operations and processes involves the following focus areas:

- Ensuring full compliance with regulatory requirements
- Promoting responsible water stewardship by minimising water use and water pollution
- Minimising our negative impacts on air quality
- Responding to climate change risks and opportunities and promoting responsible energy management
- Managing our waste streams
- Promoting responsible land management and biodiversity practices.

All our operations have environmental management systems and are required to achieve and retain ISO 14001 certification. All operations have been certified in terms of the new ISO 14001: 2015 standard, except for Marula which will conduct a certification audit in FY2019. In line with our environmental management system expectations, all operations are required to identify and report on environmental incidents. Systems are in place to investigate and determine the direct and root causes of incidents and to address and close out these incidents.

Further details relating to the materiality of environmental aspects, management processes, performance and commitments are reported in the 2018 Sustainable Development report. Rehabilitation provision is further discussed in the 2018 Implats Annual Financial Statements (refer in particular to note 15). These reports will be published at **www.implats.co.za** in September 2018.

The financial provisions for the rehabilitation can be summarised as follows:

Name	Current cost estimates R million*	Financial provision R million**
Impala Rustenburg	1 234	631
Impala Springs	255	201
Marula	279	79
Afplats	16	7
Zimplats	594	307
Totals	**2 378**	**1 225**

* *The current expected cost to restore the environmental disturbances as estimated by third-party experts for purposes of regulatory compliance is R2 378 million for the Group. The amounts in the table above for accounting purposes exclude VAT, Ps & Gs and contingencies. The Zimplats estimate includes Ps & Gs and contingencies.*

** *Future value of the current cost estimates discounted to current balance sheet date as provided in the Annual Financial Statements of the Group.*

In compliance with the DMR, the South African liabilities are secured through trust funds, insurance policies and bank guarantees.

Attributable Mineral Resources and Mineral Reserves

Attributable Mineral Resources inclusive of Mineral Reserves as at 30 June 2018

	Attributable Mineral Resources inclusive of Reserves					Implats' share-holding %	Attributable ounces					
	Orebody	Category	Tonnes Mt	4E grade g/t	6E grade g/t		Moz Pt	Pd	Rh	Au	4E	6E
Impala	Merensky	Measured	124.8	6.15	6.92	96	15.6	6.9	1.40	0.84	24.7	27.8
		Indicated	64.4	6.14	6.91	96	8.0	3.5	0.72	0.43	12.7	14.3
		Inferred	12.2	5.98	6.73	96	1.5	0.7	0.13	0.08	2.4	2.6
	UG2	Measured	153.1	5.51	6.61	96	15.6	8.4	2.83	0.25	27.1	32.5
		Indicated	68.1	5.51	6.61	96	7.0	3.7	1.26	0.11	12.1	14.5
		Inferred	12.1	5.36	6.43	96	1.2	0.6	0.22	0.02	2.1	2.5
	Total		**434.7**	**5.80**	**6.74**		**48.9**	**23.8**	**6.56**	**1.73**	**81.0**	**94.2**
Marula	Merensky	Measured	25.0	4.26	4.56	73	2.0	1.1	0.10	0.26	3.4	3.7
		Indicated	5.6	4.20	4.50	73	0.4	0.2	0.02	0.06	0.8	0.8
		Inferred	3.8	3.82	4.10	73	0.3	0.1	0.01	0.04	0.5	0.5
	UG2	Measured	36.5	6.11	7.17	73	3.2	3.2	0.67	0.09	7.2	8.4
		Indicated	16.3	6.18	7.25	73	1.5	1.5	0.30	0.04	3.2	3.8
		Inferred	4.7	6.26	7.34	73	0.4	0.4	0.09	0.01	0.9	1.1
	Total		**91.9**	**5.42**	**6.19**		**7.8**	**6.6**	**1.20**	**0.49**	**16.0**	**18.3**
Afplats	UG2	Measured	72.8	5.19	6.47	74	7.4	3.3	1.39	0.06	12.1	15.1
		Indicated	8.0	5.11	6.36	74	0.8	0.4	0.15	0.01	1.3	1.6
		Inferred	41.3	5.06	6.25	74	4.1	1.8	0.77	0.03	6.7	8.3
	Total		**122.2**	**5.14**	**6.39**		**12.3**	**5.5**	**2.31**	**0.09**	**20.2**	**25.1**
Two Rivers	Merensky	Indicated	34.5	3.06	3.34	46	2.0	1.0	0.12	0.23	3.4	3.7
		Inferred	48.2	3.59	3.90	46	3.2	1.8	0.19	0.38	5.6	6.0
	UG2	Measured	6.0	4.54	5.50	46	0.5	0.3	0.09	0.01	0.9	1.1
		Indicated	36.8	4.69	5.63	46	3.0	1.9	0.56	0.05	5.5	6.7
		Inferred	37.0	4.77	5.69	46	3.0	2.1	0.56	0.05	5.7	6.8
	Total		**162.5**	**4.03**	**4.64**		**11.7**	**7.1**	**1.52**	**0.72**	**21.1**	**24.2**
Zimplats	MSZ	Measured	157.5	3.53	3.72	87	8.9	7.0	0.74	1.27	17.9	18.8
		Indicated	533.6	3.55	3.74	87	30.7	23.0	2.46	4.75	60.9	64.2
		Inferred	180.3	3.47	3.65	87	10.3	7.4	0.80	1.62	20.1	21.2
	Total		**871.5**	**3.53**	**3.72**		**49.8**	**37.4**	**4.00**	**7.65**	**98.9**	**104.2**
Mimosa	MSZ	Measured	29.2	3.69	3.92	50	1.7	1.4	0.14	0.27	3.5	3.7
		Indicated	15.4	3.58	3.81	50	0.9	0.7	0.07	0.14	1.8	1.9
		Inferred	13.4	3.51	3.67	50	0.8	0.6	0.06	0.12	1.5	1.6
	Total		**58.0**	**3.62**	**3.83**		**3.3**	**2.6**	**0.28**	**0.53**	**6.7**	**7.3**
All	**Total**		**1 741**	**4.36**	**4.88**		**133.8**	**83.0**	**15.9**	**11.2**	**243.9**	**273.3**

Implats reports a summary of total attributable platinum ounces as sourced from all categories of Mineral Resources of the Implats Group of companies and its other strategic interests on a percentage equity interest basis. The tabulation on the previous page reflects estimates for platinum, palladium, rhodium and gold (4E), based on the percentage equity interest. For clarity, both attributable Mineral Resources, inclusive of Mineral Reserves, and attributable Mineral Resources exclusive of Mineral Reserves are shown separately. Note that these are not in addition to each other. These are summary estimates and inaccuracy is derived from rounding of numbers. Where this happens it is not deemed significant.

Attributable Mineral Resources and Mineral Reserves

Notes

> Mineral Resources are quoted inclusive of Mineral Reserves
> Mineral Resource estimates allow for estimated geological losses but not for anticipated pillar losses during eventual mining
> In addition to the depth cut-off for the reporting of Mineral Resources as previously reported, various Mineral Resource blocks are considered on a case-by-case basis and this has resulted in areas where the eventual economic extraction is in doubt. These areas are excluded from the summation of total Mineral Resources per area and the attributable Mineral Resources. The areas involved occur at Impala, Marula, Afplats and Two Rivers
> The UG2 Mineral Resource estimates for Impala and Marula are based on a minimum mining width rather than the main UG2 chromitite layer width only. Two Rivers and Afplats report the UG2 Mineral Resource as the main UG2 chromitite layer width, which is wider than a minimum mining width
> Implats has chosen not to publish Merensky Reef Mineral Resource estimates for Afplats as the eventual economic extraction is presently in doubt and under review
> Zimplats agreed to release to the GoZ, 23 903 hectares within the Zimplats mining lease area in support of the government's effort to enable participation by other investors in the platinum mining industry. The land released in the northern portion of the Zimplats lease, north of Portal 10, contained some 53Moz Pt. These Mineral Resources are excluded in the estimates and statements shown in this report and reflect a material reduction in the Mineral Resource estimates
> During October 2017 Implats announced a strategic investment in the Waterberg Joint Venture Project. In terms of the agreement Implats holds a 15% attributable interest as at 30 June 2018, at year-end a feasibility study was in progress. The Mineral Resource estimate was not completed and is not reflected in this report. The size of the attributable Mineral Resource is not material for Implats
> The dormant storage facilities of Tailings Complex 1 and 2 at Impala which amount to 0.6Moz Pt Indicated Mineral Resources are reported separately under the Impala section
> 4E refers to the summation of platinum, palladium, rhodium and gold
> 6E refers to the summation of platinum, palladium, rhodium, ruthenium, iridium and gold
> Rounding of numbers may result in minor computational discrepancies. Mineral Resource estimates are inherently imprecise in nature. The results tabulated in this report must be read as estimates and not as calculations. Inferred Mineral Resources in particular are qualified as approximations.

Summary of attributable Mineral Resources

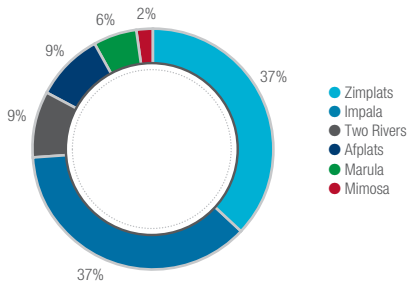
	Attributable Moz Pt				
	2014	**2015**	**2016**	**2017**	**2018**
Impala	57.6	55.0	53.1	52.6	48.9
RBR JV	1.5	1.5	1.4	1.5	
Marula	7.4	8.1	7.9	7.8	7.8
Afplats	11.9	12.3	12.3	12.3	12.3
Imbasa and Inkosi	8.5	8.6	8.6	8.6	–
Two Rivers	2.9	12.4	12.3	11.0	11.7
Tamboti	23.2	–	–	–	–
Zimplats	95.1	94.2	94.8	94.4	49.8
Mimosa	3.7	3.7	3.6	3.4	3.3
Total	**211.8**	**195.7**	**194.0**	**191.6**	**133.8**

There have been material changes in the attributable Mineral Resource estimate in comparison with the previous annual Mineral Resource Statement. The updated estimate as at 30 June 2018 is 30% lower at 134Moz Pt compared with 192Moz Pt in June 2017. The main contributors to the material decrease in attributable Pt oz are the release of the Zimplats gazetted land, the exclusion of prospecting rights at the RBR JV at Impala and the decision to exit the Imbasa and Inkosi interests. Minor changes can be attributed to newly acquired data, depletion and updated estimations. The decrease in Mineral Resource estimates is slightly off-set by the addition of the Kalkfontein RE area at Two Rivers.

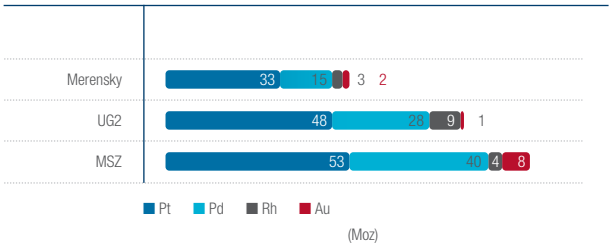
A series of accompanying graphs illustrate the following:

> The total estimated attributable platinum, palladium, rhodium and gold Mineral Resources showing 134Moz Pt, 83Moz Pd, 16Moz Rh and 11Moz Au
> The five-year statistics for the estimated attributable platinum, palladium, rhodium and gold Mineral Resources indicating a material decrease during the past year
> A comparison based on platinum ounces shows that the Impala and Zimplats Mineral Resources make up the bulk of these (74% of the total Implats inventory)
> The grouping of the platinum ounces per reef shows that some 39% of the attributable Implats Mineral Resources are hosted by the MSZ.

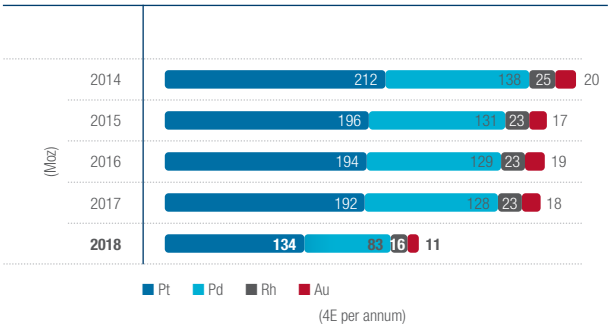
Attributable Mineral Resources of 134Moz Pt as at 30 June 2018



Attributable Mineral Resources per reef inclusive of Mineral Reserves
as at 30 June 2018



Attributable Mineral Resources inclusive of Mineral Reserves
as at 30 June 2018



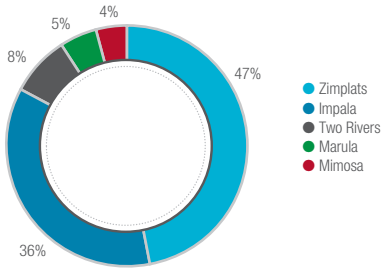
Attributable Mineral Reserves as at 30 June 2018

	Orebody	Category	Attributable Mineral Reserves as at 30 June 2018 Tonnes Mt	4E grade g/t	6E grade g/t	Implats' share-holding %	Attributable ounces Moz Pt	Pd	Rh	Au	4E	6E
Impala	Merensky	Proved	9.4	3.77	4.24	96	0.7	0.3	0.06	0.04	1.1	1.3
		Probable	44.6	3.96	4.46	96	3.6	1.6	0.32	0.19	5.7	6.4
	UG2	Proved	10.9	3.62	4.35	96	0.7	0.4	0.13	0.01	1.3	1.5
		Probable	37.7	3.71	4.45	96	2.6	1.4	0.47	0.04	4.5	5.4
	Total		**102.6**	**3.81**	**4.42**		**7.6**	**3.7**	**0.99**	**0.28**	**12.6**	**14.6**
Marula	UG2	Proved	2.0	4.50	5.28	73	0.1	0.1	0.03	0.00	0.3	0.3
		Probable	14.2	4.12	4.83	73	0.8	0.8	0.18	0.02	1.9	2.2
	Total		**16.3**	**4.17**	**4.89**		**1.0**	**1.0**	**0.20**	**0.03**	**2.2**	**2.6**
Two Rivers	UG2	Proved	3.8	3.03	3.61	46	0.2	0.1	0.04	0.00	0.4	0.4
		Probable	28.8	2.96	3.49	46	1.5	0.9	0.28	0.03	2.7	3.2
	Total		**32.7**	**2.97**	**3.50**		**1.7**	**1.1**	**0.32**	**0.03**	**3.1**	**3.7**
Zimplats	MSZ	Proved	81.3	3.17	3.34	87	4.1	3.3	0.34	0.60	8.3	8.7
		Probable	115.6	3.21	3.38	87	5.9	4.7	0.49	0.86	11.9	12.6
	Total		**196.8**	**3.19**	**3.37**		**10.0**	**7.9**	**0.84**	**1.45**	**20.2**	**21.3**
Mimosa	MSZ	Proved	11.6	3.53	3.79	50	0.6	0.5	0.06	0.10	1.3	1.4
		Probable	5.6	3.36	3.63	50	0.3	0.2	0.03	0.05	0.6	0.7
	Total		**17.2**	**3.48**	**3.74**		**0.9**	**0.7**	**0.08**	**0.15**	**1.9**	**2.1**
All	**Total**		**365.5**	**3.40**	**3.76**		**21.2**	**14.4**	**2.43**	**1.95**	**40.0**	**44.2**

Summary of attributable Mineral Reserve

	Attributable Moz Pt 2014	2015	2016	2017	2018
Impala	19.8	19.2	13.5	12.1	7.6
Marula	1.1	1.2	1.1	1.0	1.0
Two Rivers	0.8	1.1	1.1	0.8	1.7
Zimplats	6.2	3.9	5.1	7.5	10.0
Mimosa	0.6	1.0	0.9	1.0	0.9
Total	**28.4**	**26.4**	**21.6**	**22.4**	**21.2**

Attributable Mineral Reserves of 21.2Moz Pt as at 30 June 2018

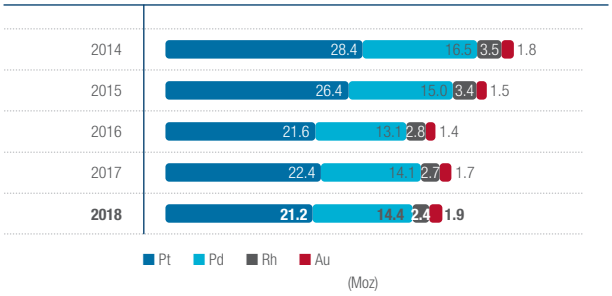


Attributable Mineral Resources and Mineral Reserves

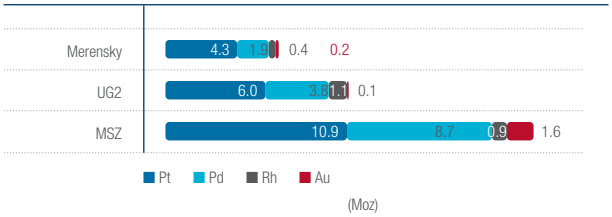
Notes

- The modifying factors used to convert a Mineral Resource to a Mineral Reserve are derived from historical performance while taking future anticipated conditions into account
- Mineral Reserves quoted reflect the grade delivered to the mill
- Zimplats' Mineral Reserves increased materially since 2017 with the conversion of some of the so-called 'Upper Ore' Mineral Resources to Mineral Reserves at the Bimha and Mupani Mines
- The increase in the Mineral Reserve estimate at Two Rivers is attributed to the addition of the Kalkfontein RE portion, which facilitated an increased mining footprint
- The strategic review and economic valuation conducted at Impala impacted negatively on the Mineral Reserve estimate at Impala. The year-on-year estimate decreased by some 37%
- The economic tail-cutting valuation impacted somewhat negatively on the Mineral Reserves at Impala and Marula
- 4E refers to the summation of platinum, palladium, rhodium and gold
- 6E refers to the summation of platinum, palladium, rhodium, ruthenium, iridium and gold
- Rounding of numbers may result in minor computational discrepancies. The results tabulated in this report must be read as estimates and not as calculations
- Implats reported attributable Mineral Reserves of some 21.2 Moz Pt at 30 June 2018 compared to 22.4 Moz Pt in June 2017. There are material changes within the combined group total. Such changes related to a material decrease at Impala (37% decrease) due to the strategic review and a decision for early closure of 1, 12 and 14 Shafts, the inclusion of some Upper Ores I at Zimplats (33% increase) and the inclusion of the RE of Kalkfontein at Two Rivers (118% increase) which facilitates access to a larger mining footprint. At Impala and Marula an economic assessment resulted in an effective tail-cutting of the production profile and Mineral Reserves at some shafts. Normal mining depletion also impacted on the estimates
- The attendant series of graphs compare the last few reporting periods and indicate an overall increase in attributable Mineral Reserves in line with depletion and the aforementioned changes:
  - The total estimated attributable platinum, palladium, rhodium and gold Mineral Reserves showing 21.2Moz Pt, 14.4Moz Pd, 2.4Moz Rh and 1.9Moz Au
  - The five-year statistics for the estimated attributable platinum, palladium, rhodium and gold Mineral Reserves indicate a minimal decrease as at 30 June 2018 compared with the previous reporting period
  - A comparison based on platinum ounces shows that the Zimplats Mineral Reserves make up the bulk of these (47% of the total Implats inventory)
- The grouping of the platinum ounces per reef shows that some 50% of the attributable Implats Mineral Reserves is hosted by the MSZ, 30% by the UG2 and 20% by the Merensky Reef.

Attributable Mineral Reserves as at 30 June 2018



Attributable Mineral Reserves (Moz) per reef as at 30 June 2018



Footwall haulage at 14 Shaft, Impala

Mineral Resources summary, exclusive of Mineral Reserves

Summary of Mineral Resource estimate, exclusive of Mineral Reserves

				FY2019											
	Mineral Resources exclusive of Mineral Reserves			Total estimate			Implats' share-holding %	Attributable estimate							
	Orebody	Remarks	Category	Tonnage Mt	4E grade g/t	6E grade g/t		Tonnage Mt	Moz Pt	Moz Pd	Moz Rh	Moz Au	Moz 4E	Moz 6E
IMPALA	Merensky		Measured	79.1	6.11	6.87	96	75.9	9.4	4.2	0.8	0.5	14.9	16.8
			Indicated	67.1	6.14	6.91	96	64.4	8.0	3.5	0.7	0.4	12.7	14.3
			Inferred	12.7	5.98	6.73	96	12.2	1.5	0.7	0.1	0.1	2.4	2.6
	UG2		Measured	113.5	5.41	6.49	96	109.0	10.9	5.9	2.0	0.2	18.9	22.7
			Indicated	71.0	5.51	6.61	96	68.1	7.0	3.7	1.3	0.1	12.1	14.5
			Inferred	12.6	5.36	6.43	96	12.1	1.2	0.6	0.2	0.0	2.1	2.5
	Total Impala			**356.0**	**5.74**	**6.68**		**341.8**	**38.0**	**18.6**	**5.2**	**1.3**	**63.1**	**73.4**
MARULA	Merensky		Measured	34.3	4.26	4.56	73	25.0	2.0	1.1	0.1	0.3	3.4	3.7
			Indicated	7.6	4.20	4.50	73	5.6	0.4	0.2	0.0	0.1	0.8	0.8
			Inferred	5.2	3.82	4.10	73	3.8	0.3	0.1	0.0	0.0	0.5	0.5
	UG2		Measured	30.4	6.20	7.27	73	22.2	2.0	2.0	0.4	0.1	4.4	5.2
			Indicated	22.4	6.18	7.25	73	16.3	1.5	1.5	0.3	0.0	3.2	3.8
			Inferred	6.4	6.26	7.34	73	4.7	0.4	0.4	0.1	0.0	0.9	1.1
	Total Marula			**106.3**	**5.32**	**6.04**		**77.6**	**6.5**	**5.3**	**0.9**	**0.5**	**13.3**	**15.1**
AFPLATS	UG2		Measured	98.4	5.19	6.47	74	72.8	7.4	3.3	1.4	0.1	12.1	15.1
			Indicated	10.8	5.11	6.36	74	8.0	0.8	0.4	0.2	0.0	1.3	1.6
			Inferred	55.9	5.06	6.25	74	41.3	4.1	1.8	0.8	0.0	6.7	8.3
	Total Afplats			**165.1**	**5.14**	**6.39**		**122.2**	**12.3**	**5.5**	**2.3**	**0.1**	**20.2**	**25.1**
TWO RIVERS	Merensky		Indicated	75.0	3.06	3.34	46	34.5	2.0	1.0	0.1	0.2	3.4	3.7
			Inferred	104.7	3.59	3.90	46	48.2	3.2	1.8	0.2	0.4	5.6	6.0
	UG2		Measured	2.8	4.93	5.92	46	1.3	0.1	0.1	0.0	0.0	0.2	0.2
			Indicated	19.0	5.00	5.98	46	8.7	0.7	0.5	0.1	0.0	1.4	1.7
			Inferred	80.4	4.77	5.69	46	37.0	3.0	2.1	0.6	0.1	5.7	6.8
	Total Two Rivers			**281.8**	**3.90**	**4.42**		**129.6**	**9.1**	**5.4**	**1.0**	**0.7**	**16.2**	**18.4**
ZIMPLATS	MSZ		Measured	40.7	4.19	4.42	87	35.4	2.4	1.9	0.2	0.3	4.8	5.0
			Indicated	397.7	3.63	3.83	87	346.0	20.4	15.1	1.6	3.3	40.4	42.6
			Inferred	207.3	3.47	3.65	87	180.3	10.3	7.4	0.8	1.6	20.1	21.2
	Total Zimplats			**645.7**	**3.61**	**3.81**		**561.8**	**33.1**	**24.4**	**2.6**	**5.2**	**65.3**	**68.8**
MIMOSA	MSZ		Measured	23.5	3.53	3.76	50	11.7	0.7	0.5	0.1	0.1	1.3	1.4
			Indicated	18.0	3.63	3.85	50	9.0	0.5	0.4	0.0	0.1	1.0	1.1
			Inferred	26.8	3.51	3.67	50	13.4	0.8	0.6	0.1	0.1	1.5	1.6
	Total Mimosa			**68.2**	**3.55**	**3.75**		**34.1**	**1.9**	**1.5**	**0.2**	**0.3**	**3.9**	**4.1**
	All Mineral Resources exclusive of Mineral Reserves		Measured	423	5.23	6.10		353	35	19	5	2	60	70
			Indicated	688	4.16	4.58		561	41	26	4	4	76	84
			Inferred	512	4.02	4.50		353	25	16	3	2	45	51
		Total		**1 623**	**4.39**	**4.95**		**1 267**	**101**	**61**	**12**	**8**	**182**	**205**

Mineral Resources summary, exclusive of Mineral Reserves

Both inclusive and exclusive methods of reporting Mineral Resources are permitted by various international reporting codes. Implats has adopted inclusive reporting for consistency purposes and to be aligned with its strategic partners. A collation of the Mineral Resources estimates exclusive of Mineral Reserves is presented on the previous page as it allows for additional transparency. Note that this format is not adhered to by Implats' strategic partners and the corresponding estimates have been derived from details provided to Implats.

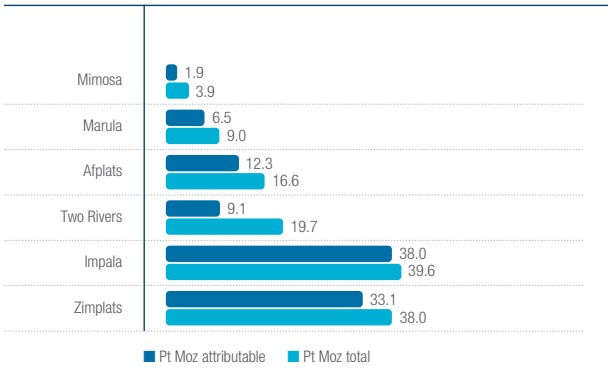
Summary of attributable Mineral Resources exclusive of Mineral Reserves

	Attributable Moz Pt				
	2014	**2015**	**2016**	**2017**	**2018**
Impala	28.4	27.9	34.6	35.6	38.0
RBRJV	1.5	1.5	1.4	1.5	
Marula	6.3	6.7	6.9	6.5	6.5
Afplats	11.9	12.3	12.3	12.3	12.3
Imbasa/Inkosi	8.5	8.6	8.6	8.6	
Two Rivers	1.7	10.7	10.8	9.7	9.1
Tamboti	23.2				
Zimplats	87.3	89.2	87.8	83.5	33.1
Mimosa	2.9	2.3	2.3	2.0	1.9
Total	**171.7**	**159.2**	**164.7**	**159.7**	**100.9**

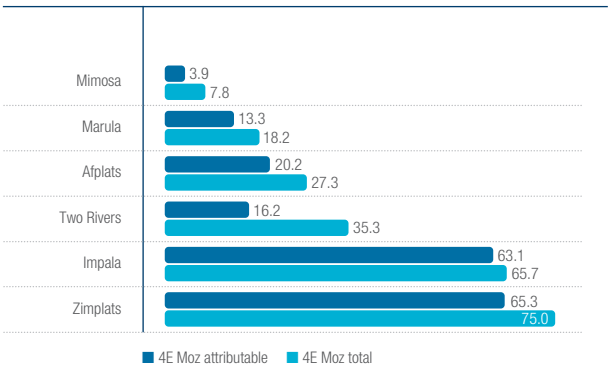
Notes

> The figures in the accompanying table reflect those Mineral Resources that have not been converted to Mineral Reserves, ie these are the Mineral Resources exclusive of Mineral Reserves
> The tabulation should be read in conjunction with the Mineral Reserve Statement in the preceding sections
> A direct comparison of tonnes and grade is not possible between inclusive and exclusive reporting, owing to the mixing of Mineral Resource figures with production estimates
> Mineral Resource estimates allow for estimated geological losses but not for anticipated pillar losses during eventual mining
> Note that similar to previous reports, certain areas have been excluded from the Mineral Resource estimates and are now reported in a standalone section at the end of this report
> Implats has chosen not to publish Merensky Reef Mineral Resource estimates for Afplats as the eventual economic extraction is presently in doubt
> The major attributors to the decrease of the Mineral Resources exclusive of Mineral Reserves are the disposal of the Impala/RBR JV area, Imbasa and Inkosi and the Zimplats gazetted land north of Portal 10
> At Impala several changes impacted on the exclusive Mineral Resource estimate, however, the resultant estimate is similar to the previous year. Some Mineral Reserves were reclassified to Mineral Resources as part of the strategic review (eg at 1, 12 and 14 Shafts), the RBR JV area and some Inferred Mineral Resources are now excluded (down-dip area at the previous 19 Shaft study block)
> The decrease in the Mineral Resources exclusive of Mineral Reserves of Two Rivers is attributed to the addition of the Kalkfontein RE portion. This facilitated access to a larger footprint that resulted in an increase in the Mineral Reserves and the change in Implats' attributable percentage
> The Exclusive Mineral Resources summary excluded the dormant storage facilities of Tailings Complex 1 and 2 at Impala and is reported under the Impala section
> 4E refers to the summation of platinum, palladium, rhodium and gold
> 6E refers to the summation of platinum, palladium, rhodium, ruthenium, iridium and gold
> Rounding of numbers may result in minor computational discrepancies. Mineral Resource estimates are inherently imprecise in nature. The results tabulated in this report must be read as estimates and not as calculations. Inferred Mineral Resources in particular are qualified as approximations.

Exclusive Mineral Resources Pt Moz as at 30 June 2018
(total and attributable)



Exclusive Mineral Resources 4E Moz as at 30 June 2018
(total and attributable)



Reconciliation

The consolidated high-level reconciliation of total Mineral Resources and Mineral Reserves for the Implats Group of companies is shown below. These high-level variances are relatively small. Particulars of these variances, in addition to depletions, are illustrated in more detail in the sections by operation. Rounding of numbers may result in computational discrepancies, specifically in these high-level comparisons.

Total Mineral Resources tonnage (million), inclusive of Mineral Reserves

	2014	2015	2016	2017	Variance	2018	Attributable 2018
Impala*	458	457	442	502	(50)	**453**	435
Marula	100	108	106	127	(1)	**126**	92
Afplats	160	165	165	165	–	**165**	122
Imbasa/Inkosi	173	175	175	175	(175)	**–**	–
Two Rivers	105	353	350	317	36	**353**	162
Tamboti	337	–	–	–	–	**–**	–
Zimplats	2 066	2 060	2 068	2 060	(1 059)	**1 002**	872
Mimosa	129	128	125	120	(4)	**116**	58
Total	**3 530**	**3 445**	**3 432**	**3 466**	**(1 251)**	**2 215**	**1 741**

** Includes the RBR JV 2014 – 2017.*

Total Mineral Resources Pt ounces (million), inclusive of Mineral Reserves

	2014	2015	2016	2017	Depletion	Gains and other changes	2018	Attributable 2018
Impala*	60.5	60.3	58.2	57.9	(0.87)	(6.1)	**50.9**	48.9
Marula	10.1	11.1	10.8	10.7	(0.10)	0.1	**10.6**	7.8
Afplats	16.1	16.6	16.6	16.6	–	–	**16.6**	12.3
Imbasa/Inkosi	16.1	16.3	16.3	16.3	–	(16.3)	**–**	–
Two Rivers	6.5	25.2	25.1	22.4	(0.22)	3.3	**25.5**	11.7
Tamboti	23.2				–	–		–
Zimplats	109.3	108.3	109.0	108.5	(0.36)	(50.8)	**57.3**	49.8
Mimosa	7.5	7.4	7.2	6.9	(0.18)	–	**6.7**	3.3
Total	**249.3**	**245.1**	**243.2**	**239.1**	**(1.7)**	**(69.9)**	**167.6**	**133.8**

** Includes the RBR JV 2014 – 2017.*

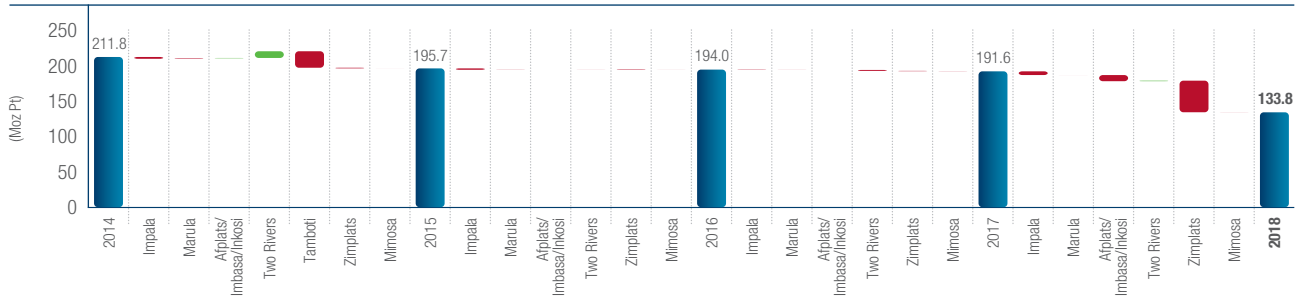
Notes

> The Impala estimate in the above table includes the contiguous Impala/RBR JV estimate from 2014 to 2017. The decrease in the Impala Mineral Resource tonnage is due to the exclusion of the RBR JV prospecting right areas and the removal of the 19 Shaft Inferred Mineral Resource inventory
> Depletion was adjusted by global concentrator and mine call factors
> Potential impact of pillar factors was taken into account
> Imbasa and Inkosi Mineral Resources are excluded further to the decision to dispose of the Implats interest
> The increase in the Two Rivers Mineral Resources is a result of the transfer of the Kalkfontein RE portion to the Two Rivers mining right
> The decrease in the Zimplats Mineral Resources are due to the release of the Zimplats gazetted land to the Zimbabwean government
> Smaller variances are mostly due to depletion and updates to the estimation models
> The Group Mineral Resources decreased by some 1 251 million tonnes and 71.6 Moz Pt since June 2017.

The major variances in the estimated attributable Group Mineral Resources during the past five years are:

> 2014 – 2015: At Impala the employee share issue (ESOP) of 4% impacted on the effective attributable Mineral Resource estimate; and the transfer of the Tamboti rights to Two Rivers impacted positively on Two Rivers, but overall resulted in a decrease in the attributable Group Mineral Reserves
> 2015 – 2016: No material change, mostly depletion
> 2016 – 2017: No material change, mostly depletion
> 2017 – 2018: At Impala as the RBR JV prospecting rights were not renewed; the disposal of the Imbasa and Inkosi areas; the release of the Zimplats gazetted land, impacted the Mineral Resources negatively. The increase in the Two Rivers Mineral Resources had a minor positive effect on the overall Group Mineral Resources.

Attributable Mineral Resources as at 30 June 2018 (variance Moz Pt)



Reconciliation

Total Mineral Reserves tonnage (million)

	2014	2015	2016	2017	Depletion	Gains and other changes	2018	Attributable 2018
Impala	257	256	184	168	(10.9)	(50.1)	**107**	103
Marula	25	30	26	25	(1.8)	(1.0)	**22**	16
Two Rivers	30	42	43	33	(3.5)	41.2	**71**	33
Zimplats	133	84	111	165	(6.6)	67.7	**226**	197
Mimosa	23	34	30	37	(2.8)	(0.2)	**34**	17
Total	**468**	**445**	**395**	**429**	**(25.6)**	**57.6**	**461**	**365**

Total Mineral Reserves Pt ounces (million)

	2014	2015	2016	2017	Depletion	Gains and other changes	2018	Attributable 2018
Impala	19.8	20.0	14.0	12.6	(0.75)	(3.9)	**7.9**	7.6
Marula	1.5	1.6	1.5	1.4	(0.10)	–	**1.3**	1.0
Two Rivers	1.7	2.3	2.3	1.7	(0.19)	2.2	**3.7**	1.7
Zimplats	7.1	4.5	5.9	8.6	(0.34)	3.2	**11.5**	10.0
Mimosa	1.2	1.9	1.7	2.1	(0.16)	–	**1.9**	0.9
Total	**31.3**	**30.3**	**25.4**	**26.3**	**(1.52)**	**1.6**	**26.3**	**21.2**

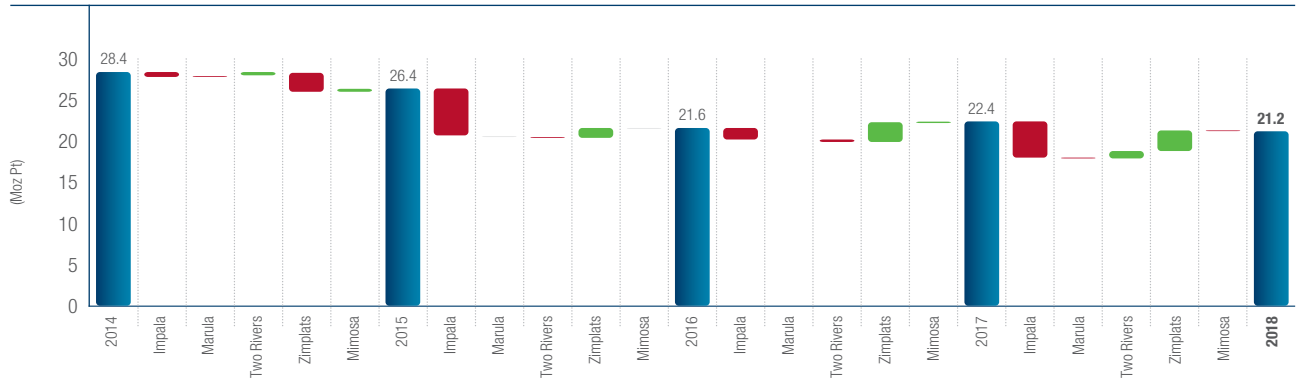
Notes

> Depletion was adjusted by global concentrator factors
> The Mineral Reserves increased at Zimplats due to addition of the steep dipping areas at Bimha Mine (Portal 4) and Mupani Mine (Portal 6)
> The increase of the Two Rivers Mineral Reserves is due to the addition of the Kalkfontein RE portion, which facilitated access to an increased mining footprint
> The minor decrease in the Marula and Mimosa Mineral Reserves is due to mining depletion
> At Impala the Mineral Reserves decreased due to strategic economic valuation of the individual shafts and tail-cutting
> Smaller changes over the past few years are mostly related to depletion.

The major variances in the estimate Group Mineral Reserves during the past five years are:

> 2013 – 2014: Aligning Zimplats with the Group standards, ie, excluded Portals 6 – 7 from the Mineral Reserve estimate
> 2014 – 2015: Excluded Portal 5 at Zimplats from the Mineral Reserve estimate, also at Zimplats a revised pillar design impacted negatively on the Mineral Resource estimate
> 2015 – 2016: At Impala 17 Shaft was placed on care and maintenance and those Mineral Reserves were excluded
> 2016 – 2017: At Impala the economic tail-cut impacted negatively, while the addition of the Mupani Mine (Portal 6) at Zimplats effectively increased the Mineral Reserve estimate
> 2017 – 2018: At Impala the strategic review and economic valuation of the individual shafts and tail-cutting impacted negatively, while the addition of some Upper Ores at Bimha Mine and Mupani Mine at Zimplats and the Kalkfontein RE portion effectively increased the Mineral Reserve estimate.

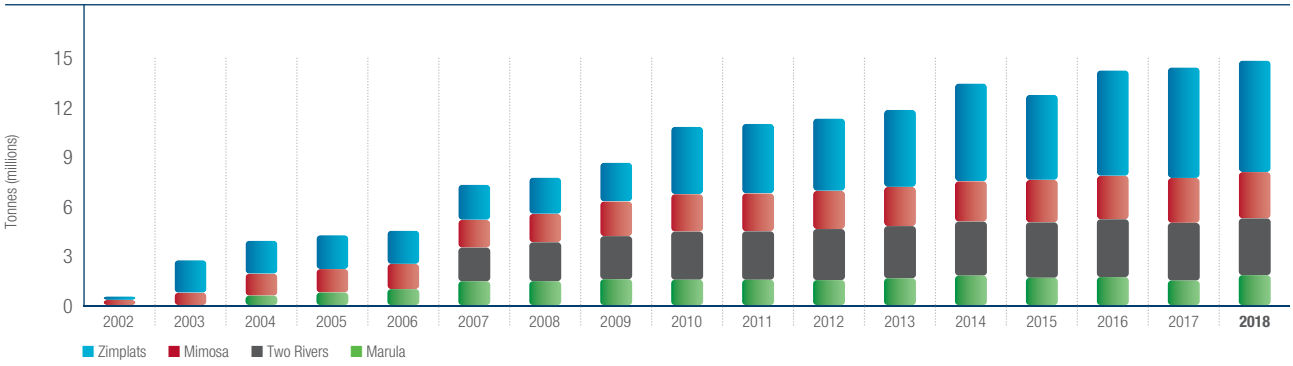
Attributable Mineral Reserves as at 30 June 2018 (variance Moz Pt)



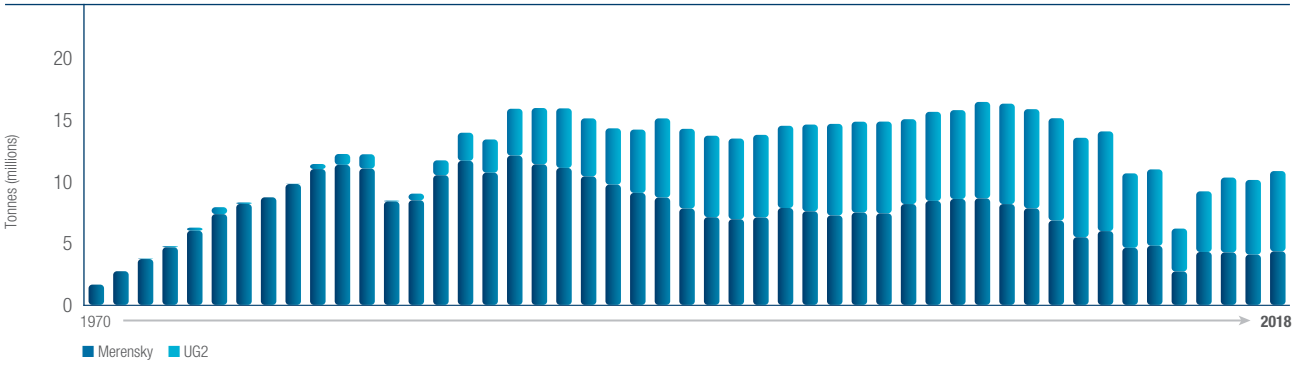
Historic production

SUMMARY STATISTICS RELATING TO THE HISTORIC PRODUCTION OF THE GROUP IS INDICATED IN THE ACCOMPANYING GRAPHS AND TABLE. OVERALL THE GROSS REFINED PLATINUM OUNCES FOR THE GROUP DECREASED FROM 1 530Koz PLATINUM TO 1 468Koz PLATINUM.

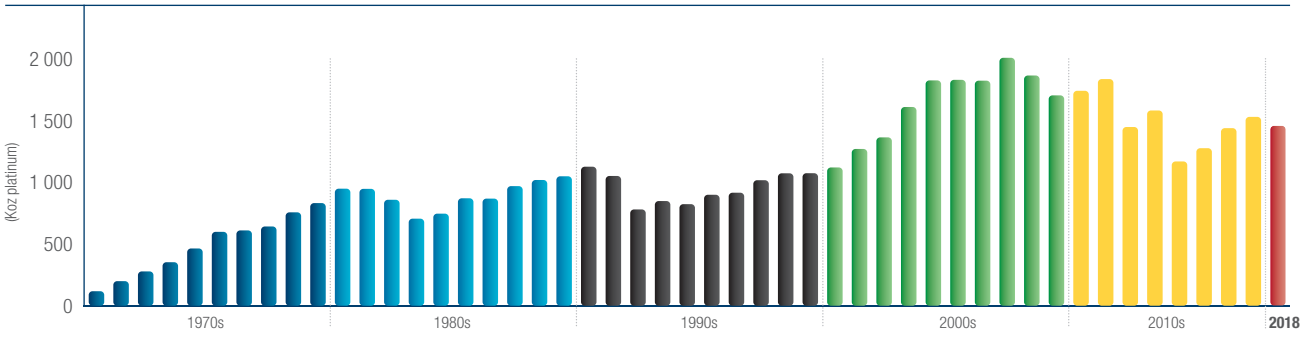
Historic annual production at Marula, Two Rivers, Mimosa and Zimplats as at 30 June 2018



Historic annual production at Impala as at 30 June 2018



Gross Implats Pt production as at 30 June 2018

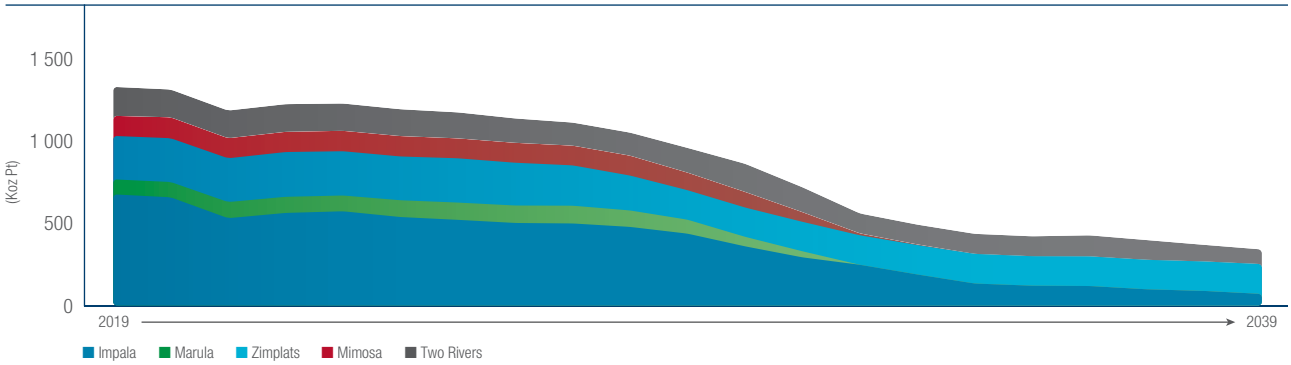


Life-of-mine production

The high-level LoM (20-year) plan is depicted in the detailed sections per operation in terms of planning levels I, II and III. These graphs reflect 100% of the annual production forecasts and not the portion attributable to Implats. These do not include all the 'Blue Sky' opportunities – some of this potential is specifically excluded at this early stage. Caution should be exercised when considering the LoM plans as these may vary if assumptions, modifying factors, exchange rates or metals prices change materially. These LoM profiles should be read in conjunction with Mineral Resource estimates to determine the long-term potential.

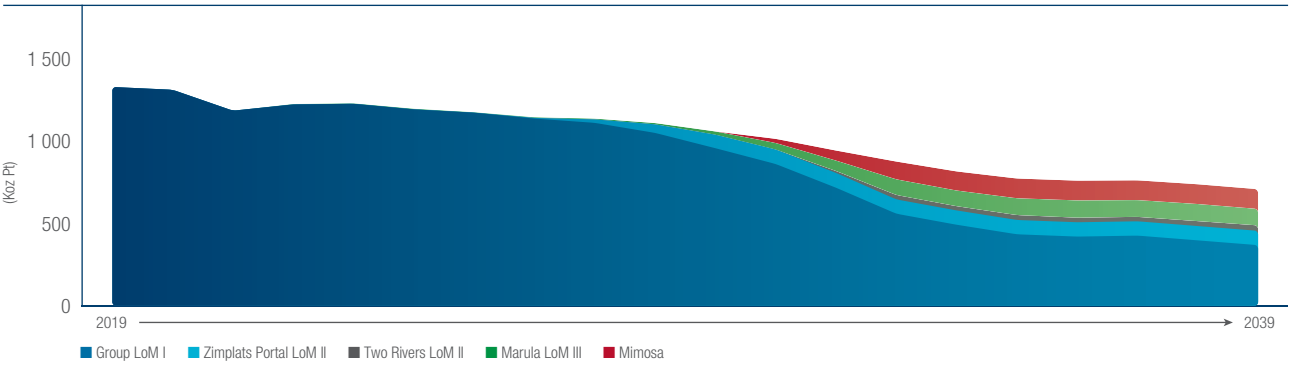
The graph below shows the consolidated high-level LoM I plans collated from the individual profiles per operation. This represents the Mineral Reserve as at 30 June 2018 and only reflects current infrastructure. There are no Inferred Mineral Resources included in the LoM I and Mineral Reserve estimates. The impact of the strategic review at Impala where a number of shafts are earmarked for closure due to profitability reasons is evident in the Impala and Group LoM profiles. The Impala profile is markedly reduced when compared with prior years.

Implats Group 20-year LoM I Pt ounce profile as at 30 June 2018 (current infrastructure)



The pictorial 20-year profiles are shown as a combination of level I with selected level II profiles at Zimplats, Mimosa, Marula and Two Rivers. Only LoM I is based on Mineral Reserves while LoM II and III have not been converted to Mineral Reserves. LoM II at Impala and the LoM for Afplats are not included in the combined graph given the outlook for these. This combined graph therefore shows a significant lower profile from 2030 onwards compared with the profile published as at 30 June 2017. It is clear from a combined Group perspective that a large proportion of the 20-year plan is still at Levels II and III and would require an improved financial outlook, further studies, funding and capital approval by the Board. Feasibility studies are continuing at Two Rivers, Zimplats, Marula, Two Rivers and the Waterberg project to evaluate future opportunities.

Implats Group 20-year LoM I Pt ounce profile – LoM I and selected LoM II and III additions at Zimplats, Marula, Two Rivers and Mimosa
as at 30 June 2018



Life-of-mine production

Summary production statistics

	units	2018	2017	2016	2015	2014
Tonnes milled						
Impala	Kt	**10 947**	10 121	10 316	9 199	6 183
Marula	Kt	**1 838**	1 495	1 703	1 662	1 794
Two Rivers	Kt	**3 445**	3 501	3 511	3 362	3 279
Zimplats	Kt	**6 570**	6 716	6 406	5 164	5 939
Mimosa	Kt	**2 802**	2 729	2 641	2 586	2 453
Mill head grade						
Impala	g/t 6E	**4.09**	4.06	4.16	4.19	4.34
Marula	g/t 6E	**4.33**	4.26	4.25	4.19	4.19
Two Rivers	g/t 6E	**3.63**	3.90	4.06	3.98	4.01
Zimplats	g/t 6E	**3.48**	3.49	3.48	3.47	3.47
Mimosa	g/t 6E	**3.84**	3.83	3.88	3.93	3.92
Production ex Impala mine						
Platinum refined	Koz	**580.8**	654.6	626.9	575.2	411.0
Palladium refined	Koz	**300.4**	308.1	299.6	280.7	197.4
Rhodium refined	Koz	**88.5**	88.7	81.1	76.7	50.2
Nickel refined	t	**3 895**	3 609	3 331	3 598	1 976
PGM refined production	Koz	**1 126.8**	1 246.6	1 219.6	1 137.3	765.9
Production ex Marula Mine*						
Platinum in concentrate	Koz	**85.1**	67.9	77.7	73.6	78.5
Palladium in concentrate	Koz	**87.5**	69.3	80.3	75.5	80.5
Rhodium in concentrate	Koz	**17.8**	14.1	16.4	15.5	16.7
Nickel in concentrate	t	**252**	213	277	253	279
PGM in concentrate	Koz	**223.5**	177.6	204.6	193.3	206.4
Production ex Two Rivers Mine*						
Platinum in concentrate	Koz	**162.5**	181.9	185.9	173.5	175.1
Palladium in concentrate	Koz	**96.6**	107.1	110.9	102.0	102.7
Rhodium in concentrate	Koz	**28.6**	31.8	33.1	30.6	31.0
Nickel in concentrate	t	**606**	602	648	584	566
PGM in concentrate	Koz	**348.4**	390.2	400.7	372.6	374.7
Production ex Zimplats Mine*						
Platinum in matte	Koz	**270.8**	281.1	289.8	190.0	239.7
Palladium in matte	Koz	**223.2**	233.0	235.8	154.8	197.6
Rhodium in matte	Koz	**23.9**	25.4	27.1	17.4	22.3
Nickel in matte	t	**4 931**	5 111	5 434	3 887	4 830
PGM in matte	Koz	**578.3**	601.7	616.9	406.0	515.8
Production ex Mimosa Mine*						
Platinum in concentrate	Koz	**125.0**	121.6	119.7	117.4	110.2
Palladium in concentrate	Koz	**98.7**	96.9	94.0	92.7	87.0
Rhodium in concentrate	Koz	**10.8**	10.5	9.9	10.2	9.3
Nickel in concentrate	t	**3 651**	3 441	3 461	3 470	3 329
PGM in concentrate	Koz	**265.6**	258.9	253.7	250.1	234.6
Gross margin						
Impala	%	**(21)**	(19.9)	(13.4)	(10.9)	(18.4)
Marula	%	**2**	(36.3)	(23.7)	(13.4)	(0.7)
Two Rivers	%	**26**	27.3	27.5	27.7	29.5
Zimplats	%	**27**	18.3	8.2	10.3	34.1
Mimosa	%	**19**	5.2	(3.3)	22.9	19.3
Gross Implats refined production**						
Platinum	Koz	**1 468**	1 530	1 438	1 276	1 178
Palladium	Koz	**849**	932	885	792	710
Rhodium	Koz	**199**	204	185	172	158
Nickel	Kt	**16.2**	17.5	17.0	15.9	13.9

** Numbers reflect 100% of production and not the portion attributable to Implats.*
*** Includes IRS production from other sources.*

Impala

HANS MERENSKY FIRST RECOGNISED PLATINUM ON THE EASTERN LIMB OF THE BUSHVELD COMPLEX IN 1924. IN 1925 MERENSKY FURTHER DISCOVERED THE MERENSKY REEF IN AN ARC FROM BRITS THROUGH RUSTENBURG TO THABAZIMBI. THIS ARC BECAME THE WESTERN BUSHVELD COMPLEX AND THE LOCATION OF IMPALA PLATINUM.

Location

Impala Platinum is located 25km northwest of the town of Rustenburg in the North West province and 140km west of Pretoria, which is situated in the Gauteng province. The Rustenburg region is known as the so-called platinum belt with vast proportions of worldwide platinum production traditionally being produced from this area. Sibanye Platinum is located to the immediate south of the Impala operation and Royal Bafokeng Platinum is situated adjacent to the northern boundary of the Impala operation.

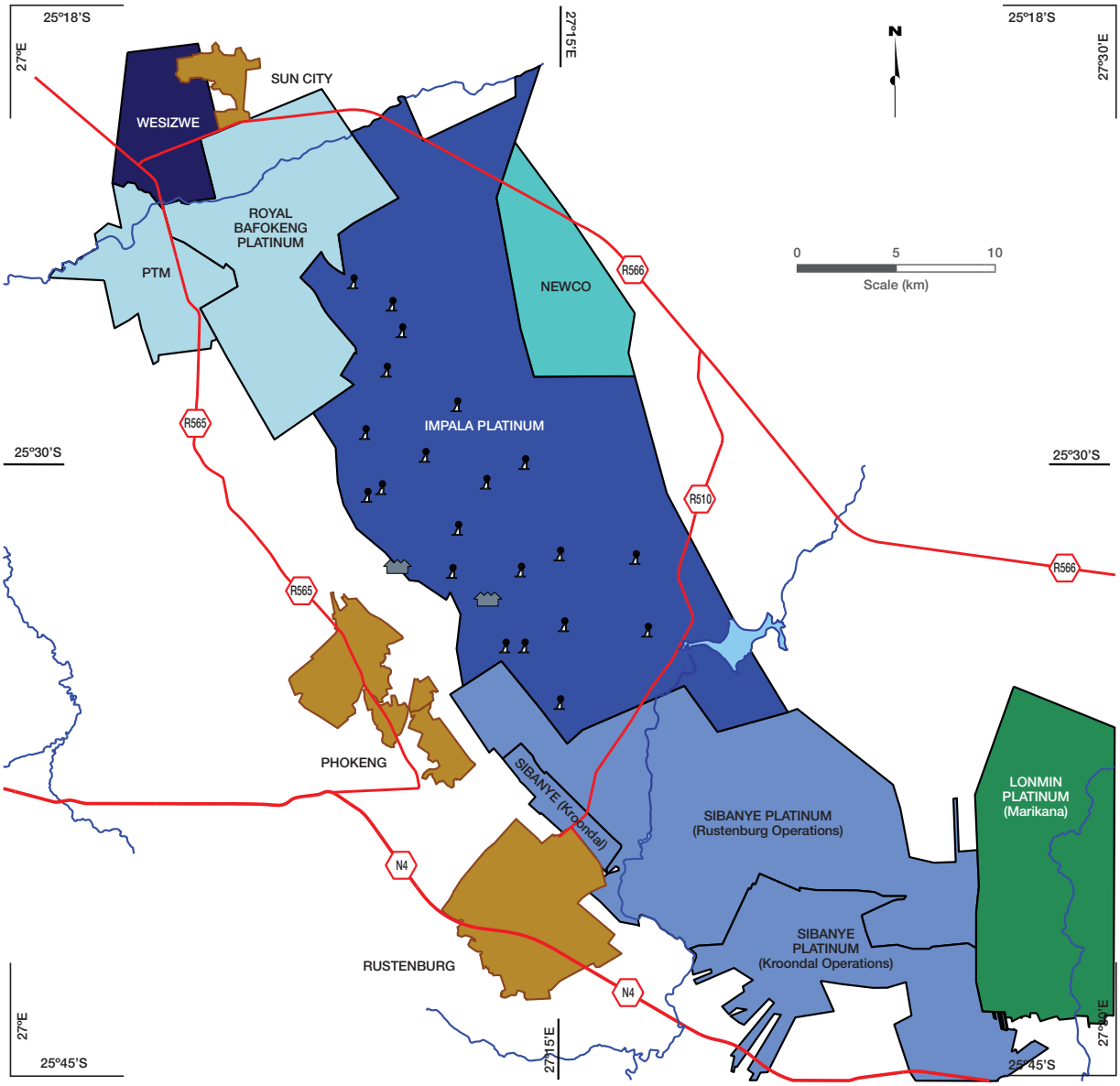
Impala

History

In 1965 Union Corporation purchased a company called Impala Prospecting Company. The first six test boreholes were drilled during 1965. The first vertical shaft (62m) was developed in 1967 to obtain a bulk Merensky sample. Impala Platinum Limited was created on 26 April 1968, as a subsidiary of Union Corporation.

Initial production commenced on 22 July 1969 after a mining lease over land predominantly owned by the then Bafokeng Tribe (now the Royal Bafokeng Nation (RBN)) was originally granted in 1968. Initially Impala mined the Merensky Reef and the mining of the UG2 Reef only began in the early 1980s as the technology to smelt ore containing chromitite at a higher temperature was developed. By the early 1990s, 13 vertical shafts were in operation and Impala was producing in the region of one million platinum ounces per annum. Shaft sinking at the new generation shafts (16, 17 and 20) commenced in the mid-2000s.

Regional locality map showing PGM mineral rights and infrastructure around Impala



Impala

Mineral rights

A landmark agreement securing Impala's access to these mineral rights for a period of 40 years was signed with the RBN in February 1999. In terms of this agreement, the RBN was entitled to royalties from metals mined in areas over which they held mineral rights. A new agreement, finalised in early March 2007, resulted in the royalty being converted into equity, making the RBN the Group's largest shareholder with Board representation at the time. In terms of the March 2007 agreement, Impala agreed to pay RBN all royalties due to them from 1 July 2007 onwards. This amounted to R12.5 billion. Effectively, through this transaction, Impala discharged its future obligation to pay royalties to the RBN. The RBN, through Royal Bafokeng Holdings Limited (RBH), used the R12.5 billion to subscribe for 75.1 million Implats shares giving them a 13.2% share in the holding company at the time. During FY2016 the RBH sold 5% of the Implats shares and now effectively owns 6.3% of the Company. In 2015, 4% of the Impala shares were issued to employees (ESOP transaction), leaving Implats with a 96% attributable interest in Impala. The mining rights at Impala were converted into new-order rights in 2008 and awarded for a 30-year period, at which time the MPRDA allows for an extension. Impala holds contiguous mining rights over a total area of 29 773ha across 16 farms, or portions of farms.

Previous Mineral Resource and Mineral Resource Statements reflected on the deeper prospecting areas held under the joint venture between Impala and the Royal Bafokeng Resources. The JV jointly concurred to exit these prospecting rights and at 30 June 2018 the process to apply for closure was underway. These prospecting rights are now excluded in all Mineral Resource estimates.

	Mining right (ha)	Implats' interest (%)
Impala	29 773	96

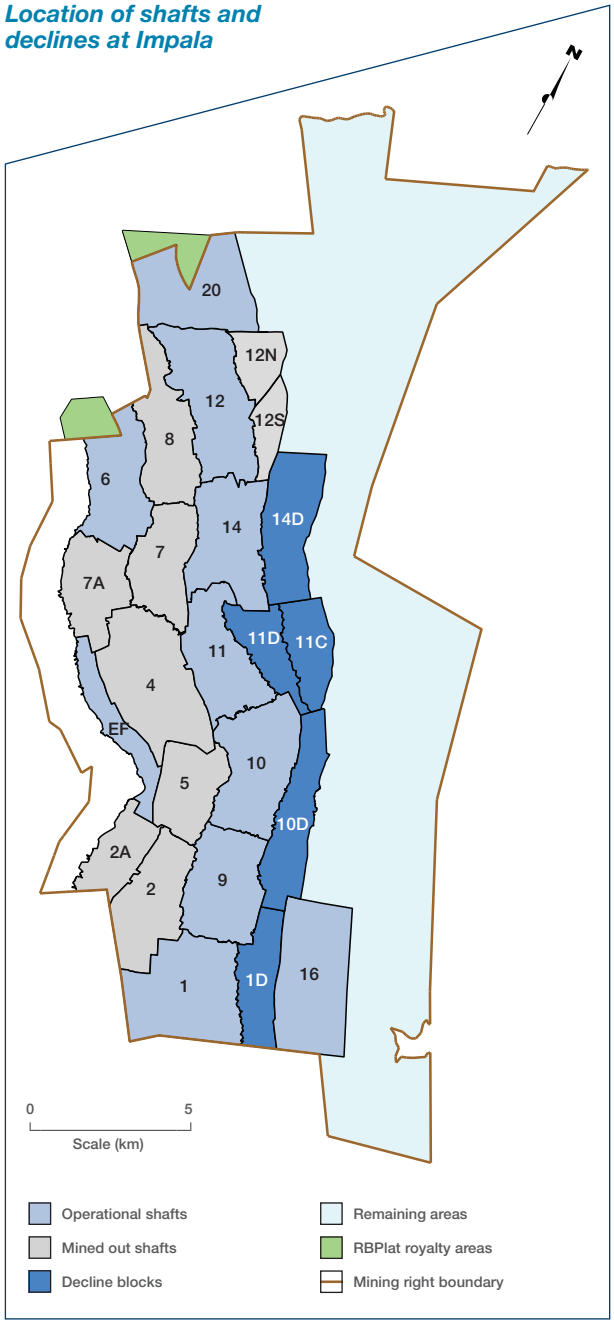
Infrastructure

Impala Platinum is an established mine with infrastructure that includes tarred roads, shaft areas, buildings, offices, railway lines, powerlines, pipelines, sewage and rock and tailings dumps. The extent of the servitude area that constitutes the infrastructure, roads, rails and dumps is 46.23km^2. The network of surface rail infrastructure between the various shaft heads, two concentrators and a smelter consists of about 92km of rail.

The Impala operations are supplied with electricity by Eskom primarily from its Ararat Main Transmission sub-station (MTS). The total installed capacity at Ararat MTS amounts to 945MVA. The operations have an adequate and firm electricity supply and distribution network. At present, there are eight main intake points on Impala, all of which have adequate redundancy. These intake points are supplied by Eskom at 88kV. The voltage is then transformed to 33kV and 6.6kV for surface and underground distributions. Eskom also has dedicated transformers at some of these sub-stations to convert the voltage to 11kV to supply electricity to the neighbouring communities. An alternate source of electricity for Impala is the Marang MTS, connected to the Impala 16 Shaft, to provide electricity during emergency conditions.

Rand Water supplies water to Rustenburg and Impala from the Vaal River system (Vaal Dam). The licence allocation is 32Ml per day. Rand Water is also supplying 3Ml water per day to Impala from the Magalies Water system. Magalies Water supplies water to Rustenburg

Location of shafts and declines at Impala



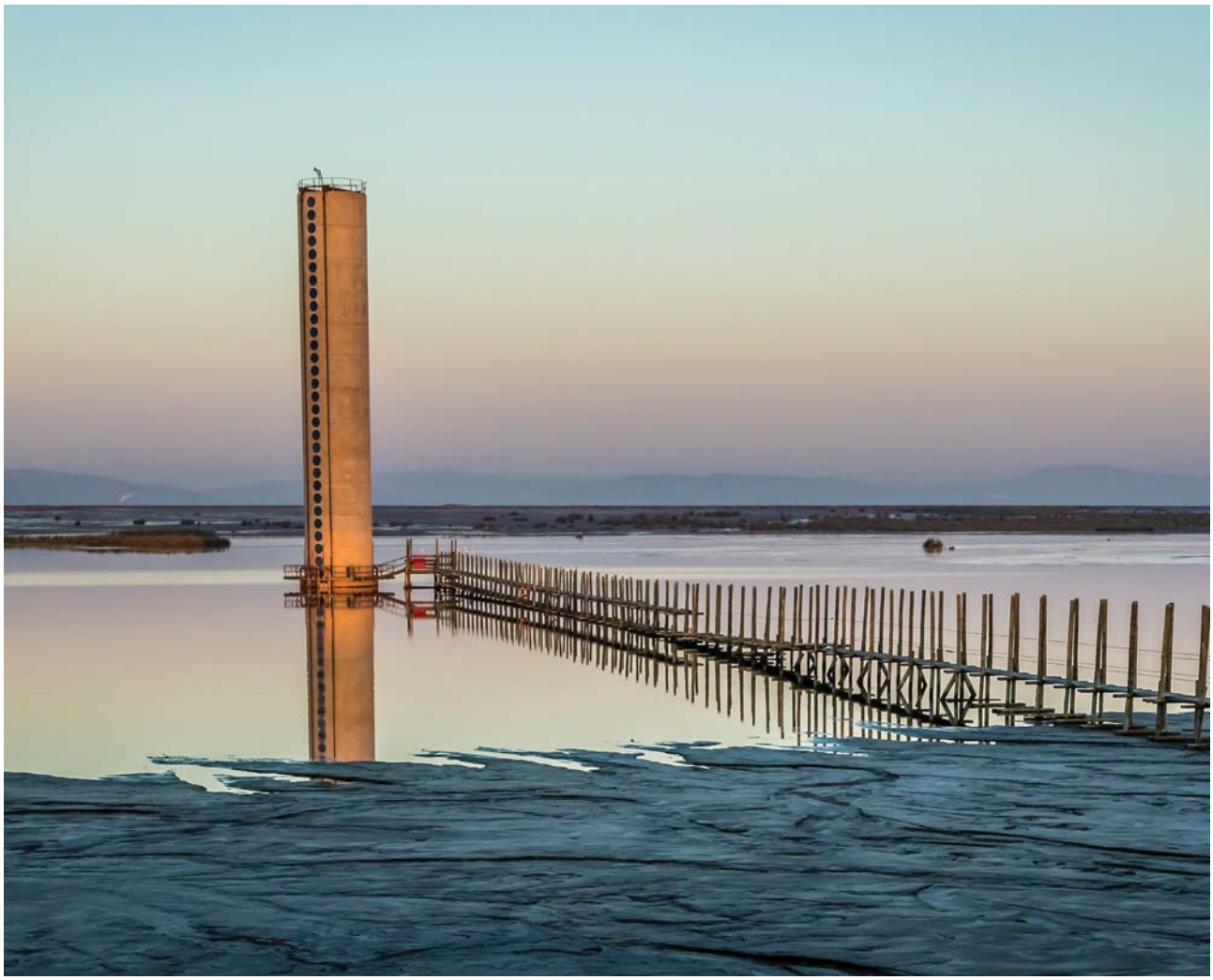
Impala

and Impala from the Crocodile River system (Vaalkop Dam). The total potable water allocation to the Impala operation is 40Ml per day. Impala also has a contract with Magalies Water to supply 5Ml of potable water per day from the Kanana take-off. The total allocation was 42Ml per day but 2Ml per day is now allocated to the new Platinum village. Impala has a contract to receive 10Ml treated effluent (grey water) per day from the Rustenburg municipal water care works for the two processing plants. The three water care works at Impala also supply about 3 to 5Ml of treated effluent per day to the Mineral Processes operations. Impala does not have major reservoirs and is dependent on the direct feed from the two providers.

Environmental

Summary details pertaining to the Group environmental management and policy are listed on page 26. This includes the focus areas such as compliance, water stewardship, air quality, managing waste streams and promoting land management practices. Impala is ISO 14001 certified and aligned with the 2015 standard.

All of the tailings currently produced by the concentrator plants are deposited on the No 4 tailings dam, which is one of the largest in South Africa with a base area of about 750 hectares. The projected life of the dam is at least another 30 years. The height of the walls vary between 40m at the lowest part to 72m at the highest. At closure, it is expected that the highest wall will reach 120m. Water is decanted for recycling back to the concentrators via two concrete penstock towers. The towers are 5.5m in diameter and are currently 40m above the pool. They are connected to two decant pipes of 1.25m diameter that route the water to the north and south return water pump stations.



Impala tailings facility

Impala

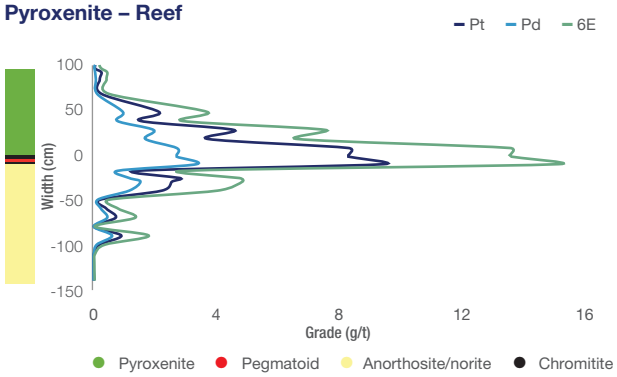
Geology

The geological succession is illustrated in the generalised stratigraphic column on the following page. The Merensky and UG2 Reefs are separated by a sequence of mostly anorthositic and noritic layered units of some 45m to 125m in combined thickness. Both the Merensky and UG2 Reefs are exploited at Impala. The Merensky Reef is generally composed of an upper feldspathic pyroxenite, overlying a thin basal chromitite stringer, followed by an anorthosite to norite footwall. Locally this is termed a 'pyroxenite reef'. Occasionally a pegmatoidal pyroxenite and a second chromitite stringer may be developed between the feldspathic pyroxenite and the footwall units. This is termed a 'pegmatoid reef'. As an aid to mining operations the Merensky Reef is further defined as being 'A', 'B' or 'C' Reef where it rests on specific footwall units – locally called Footwall 1, 2 and 3 respectively.

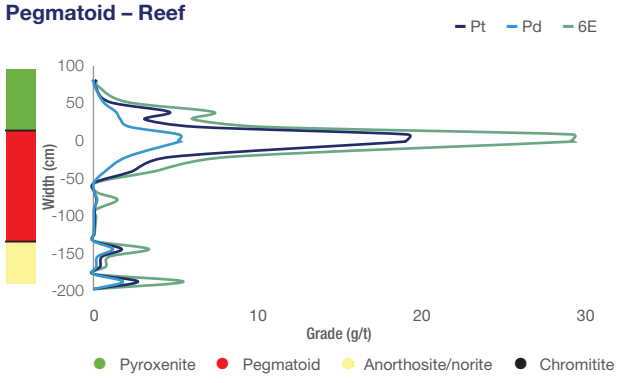
The UG2 Reef is defined as a main chromitite layer, with most of the PGM and base metal mineralisation confined to this unit, followed by a poorly mineralised pegmatoidal pyroxenite footwall. The hangingwall to the main chromitite layer is a feldspathic pyroxenite containing up to four thin, poorly mineralised chromitite layers. The vertical grade distribution is depicted in the accompanying graphs, notably showing peak values at reef contacts in association with chromitite. The average 6E metal ratios show the distinct differences between the Merensky and UG2 Reefs, in particular the higher Pt:Pd ratio associated with the Merensky Reef and the relative high proportion of rhodium in the UG2 Reef, as shown on the next page.

Both mineralised horizons dip gently away from the sub-outcrop in a north-easterly direction at 10° to 12°. The vertical separation between the Merensky and UG2 Reefs varies from about 125m in the south to 45m in the north of the mining area. The reefs may be disrupted by minor and major faults, lamprophyre, syenite and dolerite dykes, late stage ultramafic replacement pegmatoid bodies and potholes. The latter features are generally circular in shape and represent 'erosion' or 'slumping' into the footwall units. They vary in size from a few metres to tens of metres across and up to tens of metres in depth. All of these features are accounted for in the Mineral Resource and Mineral Reserve Statements as geological losses and they contribute to dilution or absence of the mineralised horizons when converted to Mineral Reserves through the planning process.

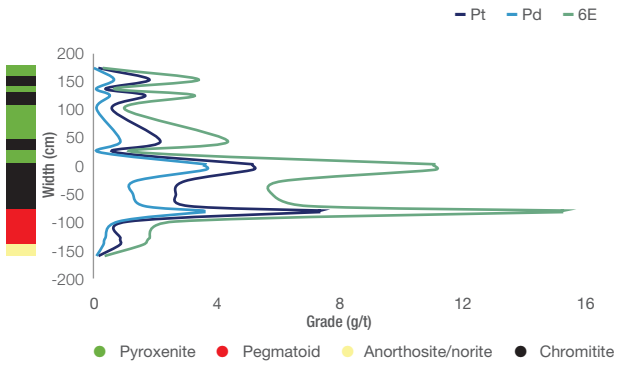
Impala – Merensky
Pyroxenite – Reef



Impala – Merensky
Pegmatoid – Reef

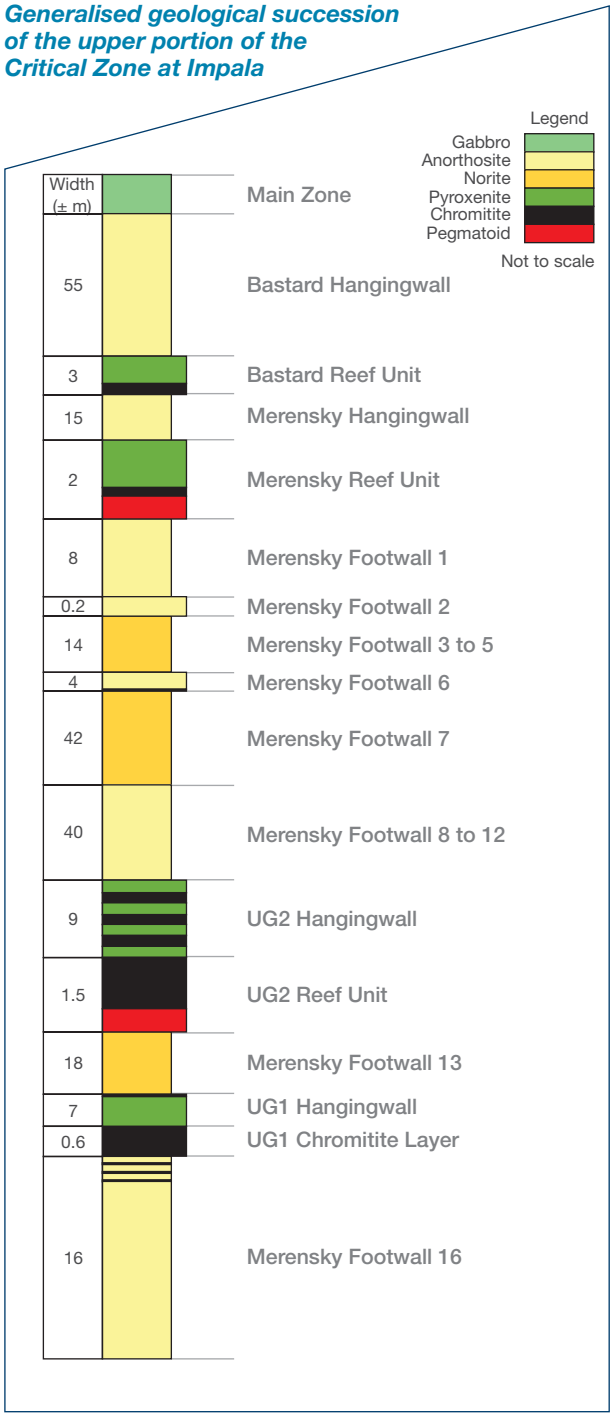


Impala – UG2

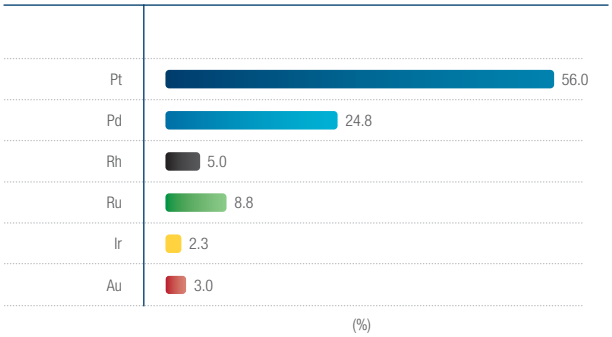


Impala

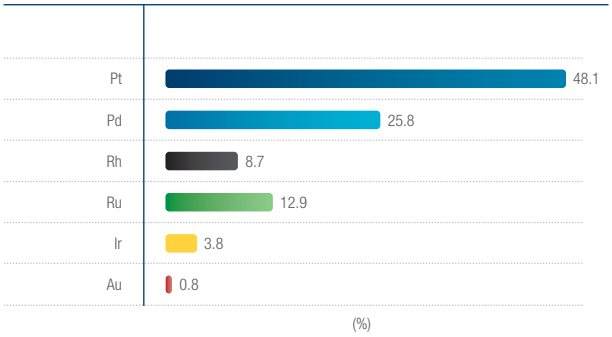
Generalised geological succession of the upper portion of the Critical Zone at Impala



Impala Merensky 6E metal ratio as at 30 June 2018



Impala UG2 6E metal ratio as at 30 June 2018

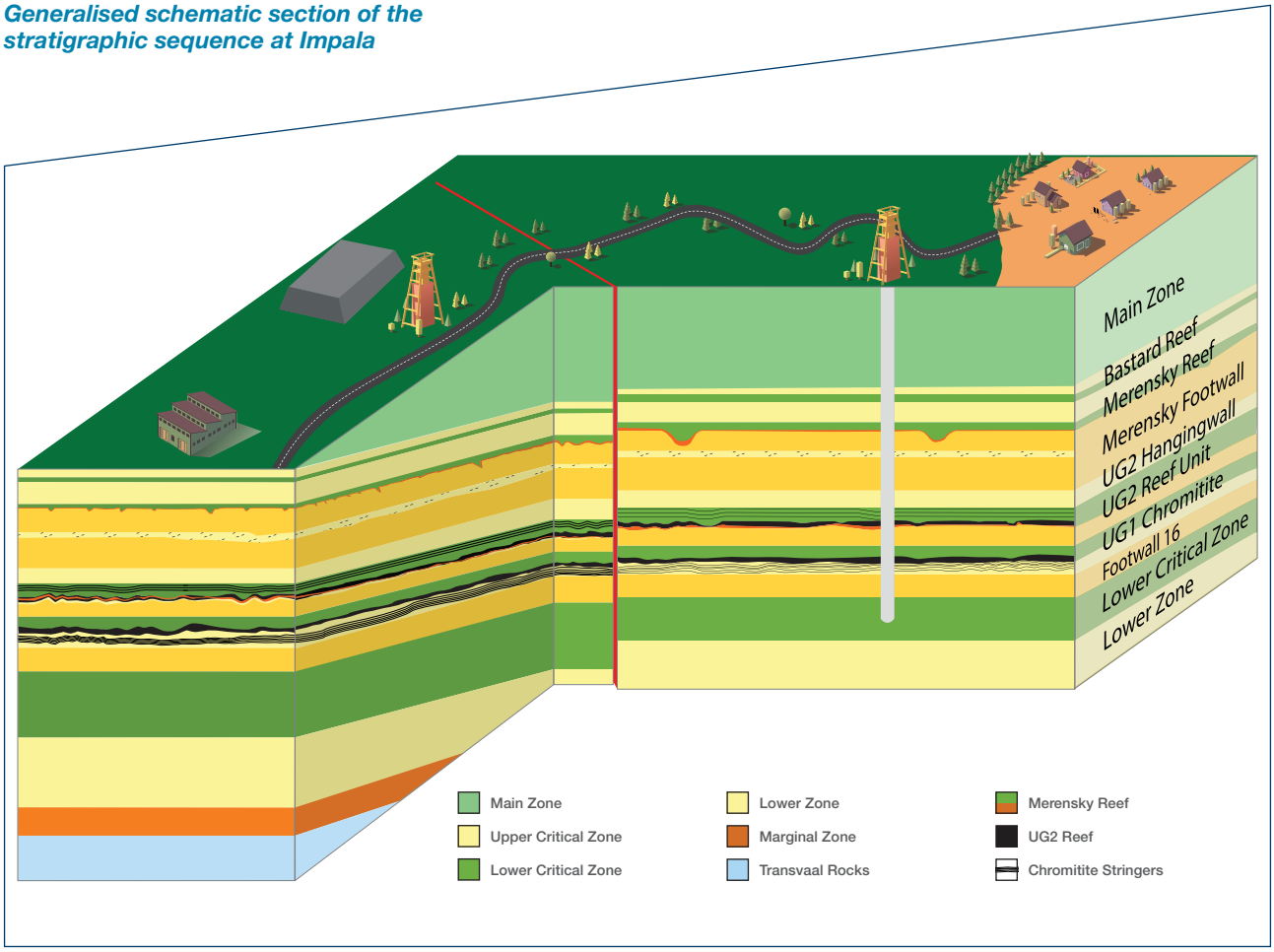


Underground borehole core delivery at 10 Shaft, Impala

Impala

A schematic diagram illustrating the broader geological succession relative to major shaft infrastructure is shown below.

Generalised schematic section of the stratigraphic sequence at Impala



Exploration

Exploration activities at Impala typically comprise geological mapping (surface and underground), geophysical surveys (aeromagnetics, 3D vibroseis) and core-recovering drilling (surface and underground). Surface drilling is typically infill work to supplement a broader grid of 500m spacing completed during feasibility stages. Such work is mostly targeted to assist with detailed structural interpretations. Underground geotechnical core-recovering drilling activities are routinely being undertaken at Impala to assist with detecting potential hazardous geological features and to assist with guiding mining operations. Underground drilling is typically employed to keep the footwall drives at the ideal elevation and to resolve structural complexities. Summary statistics pertaining to the work conducted in the past year are summarised in the exploration overview section of this report.

Exploration on the Impala mining area focused on infill drilling from surface at 11, 14, 16 and 20 Shafts where 13 boreholes were completed. At the various mining operations at Impala, 959 boreholes were drilled underground, mainly to keep the footwall drives at the ideal elevation.

Mineral Resource estimation and reconciliation

Mineral Resources are reported inclusive of Mineral Reserves. Mineral Resource grades are shown for both 4E and 6E. Mineral Resource estimates allow for estimated geological losses but not for anticipated pillar losses during eventual mining. The introduction of a depth cut-off was noted in previous reports and no Mineral Resources deeper than 2 000m below surface are reported. In addition to the depth cut-off areas, various Mineral Resource blocks are considered on a case-by-case basis and this has resulted in the identification of areas where the eventual economic extraction is in doubt. The Mineral Resource estimation method is ordinary kriging. The evaluation is conducted using on-reef development sampling as well as borehole samples which are defined by an optimal grid. The geostatistical evaluation is done to establish a Mineral Resource estimate for both short- and long-term planning. The Mineral Resource classification is based on a Group standard practice that considers the quality of the data, the continuity of the reef, if a seismic survey covers the area or not, the data spacing, and the geostatistical parameters.

Impala

Impala Mineral Resources (inclusive reporting)

as at 30 June 2018

Orebody category		Merensky Measured	Merensky Indicated	Merensky Inferred	Merensky Total	UG2 Measured	UG2 Indicated	UG2 Inferred	UG2 Total	Total
Tonnes	Mt	130.0	67.1	12.7	209.8	159.4	71.0	12.6	243.0	**452.8**
Width	cm	123	105	102		95	95	95		
4E grade	g/t	6.15	6.14	5.98	6.14	5.51	5.51	5.36	5.50	**5.80**
6E grade	g/t	6.92	6.91	6.73	6.91	6.61	6.61	6.43	6.60	**6.74**
Ni	%	0.16	0.17	0.16	0.16	0.04	0.05	0.04	0.04	**0.10**
Cu	%	0.09	0.09	0.09	0.09	0.01	0.01	0.01	0.01	**0.05**
4E oz	Moz	25.7	13.2	2.5	41.4	28.2	12.6	2.2	43.0	**84.4**
6E oz	Moz	28.9	14.9	2.8	46.6	33.9	15.1	2.6	51.6	**98.2**
Pt oz	Moz	16.2	8.4	1.5	26.1	16.3	7.3	1.3	24.8	**50.9**
Pd oz	Moz	7.2	3.7	0.7	11.5	8.7	3.9	0.7	13.3	**24.8**

as at 30 June 2017

Orebody category		Merensky Measured	Merensky Indicated	Merensky Inferred	Merensky Total	UG2 Measured	UG2 Indicated	UG2 Inferred	UG2 Total	Total
Tonnes	Mt	132.3	68.8	21.2	222.3	165.0	71.0	20.8	256.9	**479.1**
Width	cm	122	108	99		95	95	95		
4E grade	g/t	6.30	6.31	6.93	6.36	5.48	5.50	5.40	5.48	**5.89**
6E grade	g/t	7.09	7.11	7.80	7.16	6.57	6.60	6.49	6.57	**6.85**
Ni	%	0.16	0.18	0.18	0.17	0.04	0.05	0.04	0.04	**0.10**
Cu	%	0.09	0.09	0.10	0.09	0.01	0.01	0.01	0.01	**0.05**
4E oz	Moz	26.8	14.0	4.7	45.5	29.1	12.6	3.6	45.2	**90.7**
6E oz	Moz	30.2	15.7	5.3	51.2	34.9	15.1	4.3	54.3	**105.5**
Pt oz	Moz	16.9	8.8	3.0	28.6	16.8	7.3	2.1	26.1	**54.8**
Pd oz	Moz	7.5	3.9	1.3	12.7	9.0	3.9	1.1	13.9	**26.6**

as at 30 June 2018

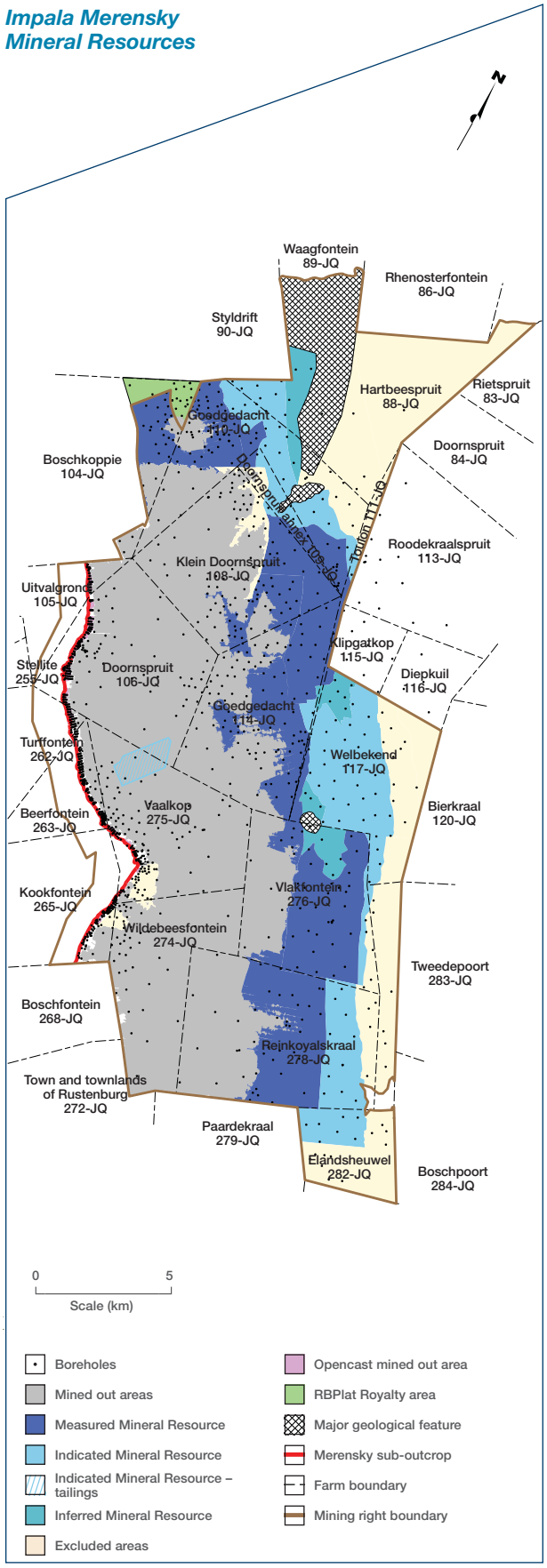
Orebody category		1 and 2 Tailings Complex Indicated	1 and 2 Tailings Complex Total
Tonnes	Mt	48.1	**48.1**
4E grade	g/t	0.69	**0.69**
Pt grade	g/t	0.42	**0.42**
4E oz	Moz	1.1	**1.1**
Pt oz	Moz	0.6	**0.6**
Pd oz	Moz	0.2	**0.2**

as at 30 June 2017

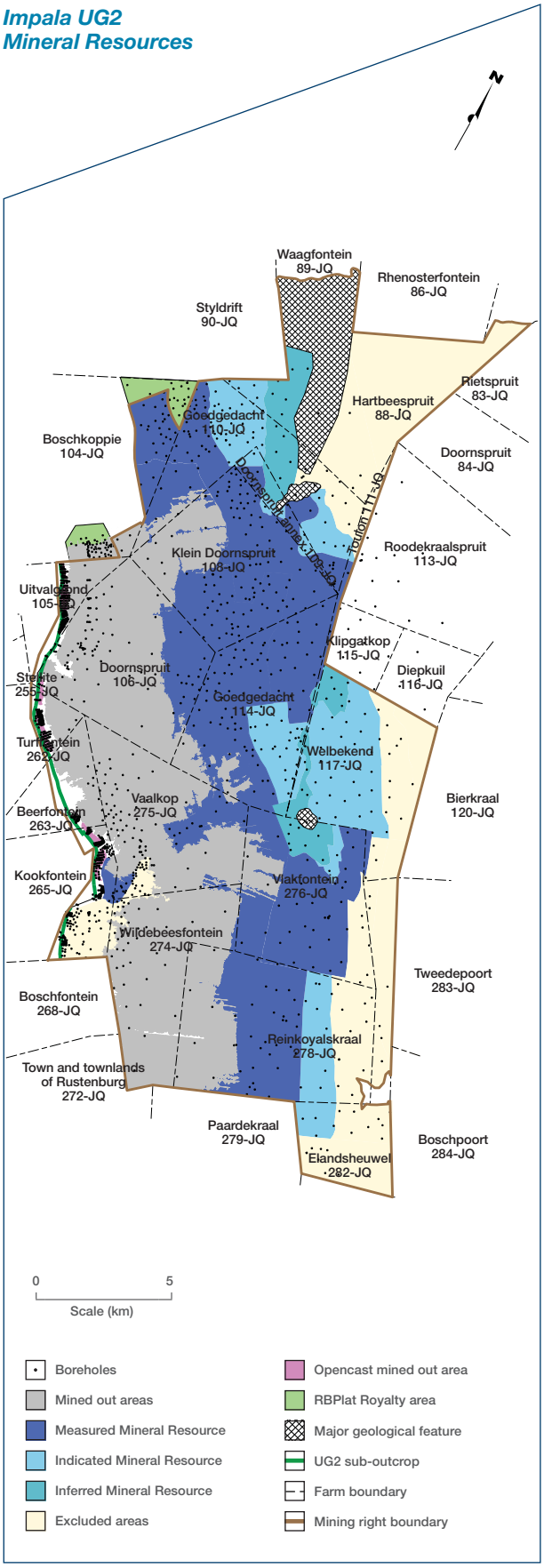
Orebody category		1 and 2 Tailings Complex Indicated	1 and 2 Tailings Complex Total
Tonnes	Mt	48.1	**48.1**
4E grade	g/t	0.69	**0.69**
Pt grade	g/t	0.42	**0.42**
4E oz	Moz	1.1	**1.1**
Pt oz	Moz	0.6	**0.6**
Pd oz	Moz	0.2	**0.2**

Impala

Impala Merensky Mineral Resources



Impala UG2 Mineral Resources



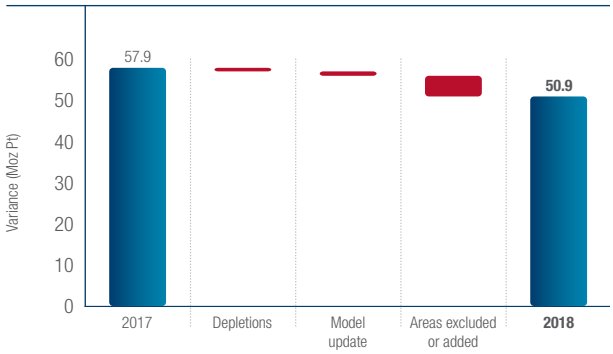
Impala

The UG2 Mineral Resources have been estimated using a minimum mining cut of 95cm and not the main chromitite layer of 65cm. It adds significant dilution but very little metal is added. Both styles of reporting were reported in June 2016; the current format provides more clarity.

The Indicated Mineral Resources contained in the dormant tailings storage facilities of Tailings Complex 1 and 2 are reported separately. Sixty-four drillholes were drilled to cover the extent of Tailings Complex 1 and 2 and ordinary kriging was used to estimate the grade and tonnage.

The overall Mineral Resource platinum ounce reconciliation indicates the depletion, model update, and a 3Moz Pt decrease due to the exclusion of the Impala/Royal Bafokeng Resources Platinum (Pty) Ltd Unincorporated Joint Venture following the joint decisions to exit these rights and also the exclusion of 2Moz Pt Inferred Mineral Resources reconsidering the depth range in the down-dip extension of the previous 19 Shaft study area.

Total Impala Mineral Resources as at 30 June 2018



Modifying factors

Key modifying factors such as overbreak, underbreak, off-reef mining, development dimensions, sweepings and mine call factors are applied to the mining area (centare profile) to generate tonnage and grade profiles. The modifying factors used to convert a Mineral Resource to a Mineral Reserve are derived from historical performance while taking future anticipated conditions into account. Implats' long-term price assumptions in today's money (supporting Mineral Reserve estimates) are shown on pages 5 and 25.

Key factors and assumptions

	Merensky Reef factors	UG2 Reef factors
Geological losses	20 – 25%	30 – 40%
Mineral Resource area in centares (ca)	60 million ca	68 million ca
Pillar factors	8 – 10%	8 – 10%
Resource dilution	9 – 12%	9 – 12%
Mine call factor	90 – 92%	88 – 90%
Relative density	3.05 – 3.25	3.7 – 3.8
Channel width	115cm	95cm
Stoping width	128cm	108cm
Concentrator recoveries	88 – 89%	79 – 82%

Impala

Mining methods and mine planning

The Merensky and UG2 Reefs are mined concurrently at Impala. The mining method is predominantly conventional breast mining. Stoping at the operations is carried out through conventional double-sided breast mining in accordance with Impala's best practice principles. The access haulages are developed in opposite directions from cross-cuts connected to a central shaft position, following the two reef horizons on strike in the footwall of the reefs and are defined as half levels. Footwall drives are developed at approximately 18m to 30m below the reef horizon with on-reef raise/winze connections being between 180m and 250m apart. Panel face lengths vary from 15m to 30m for both Merensky and UG2 Reefs, with panels being typically separated by 6m x 3m grid pillars with 2m ventilation holes. Stoping widths are approximately 1.3m and 1.1m for conventional Merensky and UG2 Reefs respectively, depending on the width of the economical reef horizon. Mechanised (trackless) bord and pillar mining occurs in selected Merensky Reef areas at 14 Shaft. The average stoping width of the mechanised panels is about 1.9m.

Mine design and scheduling of operational shafts is undertaken using CADSmine™ software, while the mine design and scheduling for project shafts are done using Mine 2-4D™ software. Geological models/ore blocks are updated and validated using G-Blocks and boundaries in the MRM information system. Grade block models are developed using Isatis™ software. The mine design for the first two years is monthly per crew. This is extended on an annual basis for the remaining period of the LoM. The planning sequence allows for a cycle that starts with a comprehensive review of the LoM plan followed by the detailed scheduling of a five-year development schedule and a two-year detailed month-by-month stoping schedule.

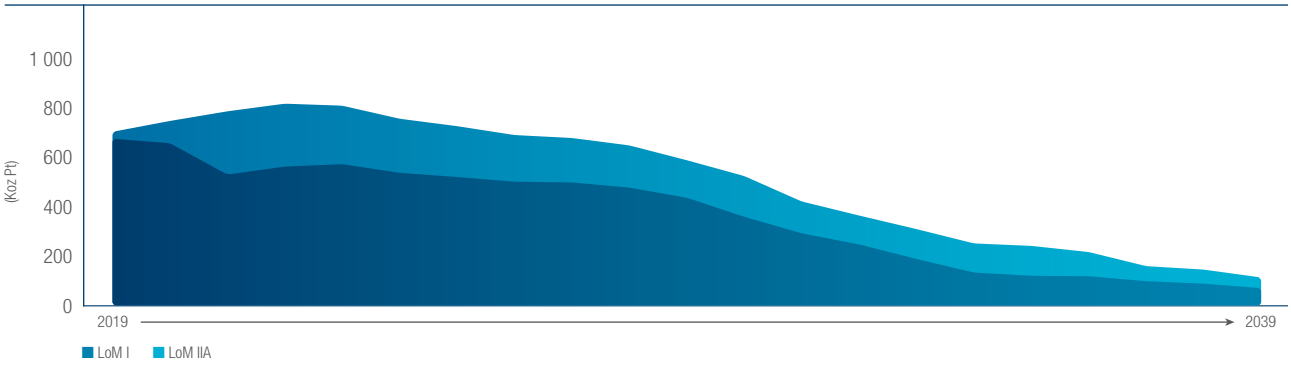
Rustenburg review

The Impala Rustenburg operation underwent a detailed scrutiny during the past year in view of a loss-making outlook. The objective of the strategic review is to create a sustainable investment case for Impala Rustenburg that secures long-term profitability through optimisation and restructuring of the operations. Key consideration of the review is the financial robust business case within the context of social responsibility to secure long-term employment. The review process concluded on the most viable option to achieve a sustainable future operation at Impala. This restructuring process provided for a focused, agile and profitable future state that safeguards the future of some 27 000 employees.

To this effect the Implats Board has approved the strategy to cease operations at unprofitable shafts at Impala. The older shafts such as 1, 4 and 9 Shafts with limited remaining Mineral Reserves are targeted for harvesting. The higher cost, mature shafts such as 12 and 14 Shafts will be optimised and operated under strict performance conditions ahead of their planned cessation towards the end of FY2020. This restructuring of Impala Rustenburg will yield a change from 11 operational shafts ramping up to 750Koz platinum, to a more compact efficient structure of six operational shafts producing approximately 520Koz platinum per annum. A direct outcome is a material reduction in the Impala Mineral Reserve estimate by some 37% and described below.

In addition the capital provision for 20 Shaft was reduced with the impact that 16 and 17 levels were removed from the LoM I and Mineral Reserve profile. These portions of the production profile are retained as Mineral Resources and are reflected as LoM IIA together with those Mineral Resources that were removed from LoM I due to economic tail-cutting.

Impala 20-year LoM Pt ounce profile as at 30 June 2018 (refined)



Impala

Mineral Reserve estimation and reconciliation

The updated Mineral Reserve estimates are tabulated in the statement below and reflect the total Mineral Reserve estimate for Impala as at 30 June 2018. Mineral Reserve grades are quoted after applying mine to mill modifying factors. Current Mineral Reserve estimates have included the latest drilling, assay results, mine design and updated modifying factors. The Mineral Reserves quoted reflect anticipated grades delivered to the mill and estimations are aligned to the business plan by estimating tonnes and grades at an average 128cm mining width for the Merensky Reef and an average 109cm mining width for the UG2 Reef. Rounding of numbers may result in minor computational discrepancies. The results tabulated in this report must be read as estimates and not as calculations.

The conversion and classification of Mineral Reserves at Impala is informed by:

- Feasible mine plan and project studies, Board approval and available funding
- Economic testing at given market conditions (price deck)
- Measured Mineral Resources are classified as Proved and Probable Mineral Reserves if the mine plan passed economic testing and is approved for funding
- Proved Mineral Reserves are those areas where the main development has been completed and a considerable amount of the geological losses have been discounted
- No Inferred Mineral Resources are converted to the Mineral Reserve category.

Mineral Reserve grades are shown for both 4E and 6E. The Mineral Reserves quoted reflect the grade delivered to the mill. The Mineral Resources and Mineral Reserves involved with the royalty agreement with RBPlat are excluded in this report as the ownership vests with RBPlat. This refers to the agreement with RBPlat to access certain of its mining areas at BRPM from the Impala 6 and 20 Shafts. An economic profitability test was conducted at each shaft, in particular also to conduct so-called tail-cutting at the end of a shaft's life. The impact varies from shaft to shaft, on average some 3% of the Mineral Reserves have now been excluded in the accompanying statement based on such economic reviews. The impact is more pronounced on the UG2 estimates at Impala. Rounding of numbers may result in minor computational discrepancies. Mineral Resource estimates are inherently imprecise in nature. The results tabulated in this report must be read as estimates and not as calculations. Inferred Mineral Resources in particular are qualified as approximations.

Impala Mineral Reserves

as at 30 June 2018

Orebody category		Merensky Proved	Merensky Probable	Merensky Total	UG2 Proved	UG2 Probable	UG2 Total	Total
Tonnes	Mt	9.8	46.5	56.3	11.4	39.2	50.6	**106.8**
Width	cm	126	129		107	109		
4E grade	g/t	3.77	3.96	3.93	3.62	3.71	3.69	**3.81**
6E grade	g/t	4.24	4.46	4.42	4.35	4.45	4.43	**4.42**
4E oz	Moz	1.2	5.9	7.1	1.3	4.7	6.0	**13.1**
6E oz	Moz	1.3	6.7	8.0	1.6	5.6	7.2	**15.2**
Pt oz	Moz	0.7	3.7	4.5	0.8	2.7	3.5	**7.9**
Pd oz	Moz	0.3	1.6	2.0	0.4	1.4	1.9	**3.8**

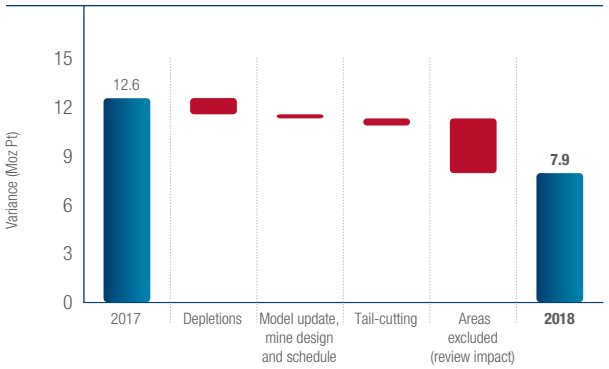
as at 30 June 2017

Orebody category		Merensky Proved	Merensky Probable	Merensky Total	UG2 Proved	UG2 Probable	UG2 Total	Total
Tonnes	Mt	10.6	65.2	75.8	13.4	78.7	92.1	**167.9**
Width	cm	135	136		108	106		
4E grade	g/t	3.83	4.12	4.08	3.74	3.67	3.68	**3.86**
6E grade	g/t	4.31	4.63	4.59	4.49	4.40	4.41	**4.49**
4E oz	Moz	1.3	8.6	9.9	1.6	9.3	10.9	**20.8**
6E oz	Moz	1.5	9.7	11.2	1.9	11.1	13.1	**24.3**
Pt oz	Moz	0.8	5.4	6.3	0.9	5.4	6.3	**12.6**
Pd oz	Moz	0.4	2.4	2.8	0.5	2.9	3.4	**6.1**

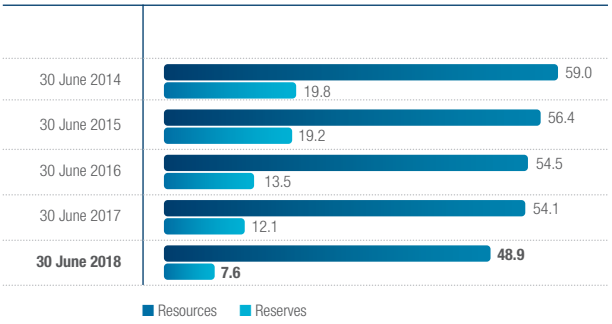
Impala

The year-on-year reconciliation of the total Impala Mineral Reserves is depicted in the accompanying maps and graphs. There has been a material change in the Mineral Reserves estimate of some 37% since June 2017, other than depletion and economic tail-cutting. The main changes occurred at 1, 12, 14 and 20 Shafts as part of the strategic economic review of Impala. The areas that are not scheduled in LoM I have been regressed to LoM IIA. A combined graph of the attributable Mineral Resources and Mineral Reserves are also included.

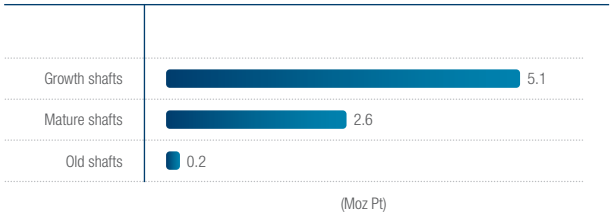
Total Impala Mineral Reserves as at 30 June 2018



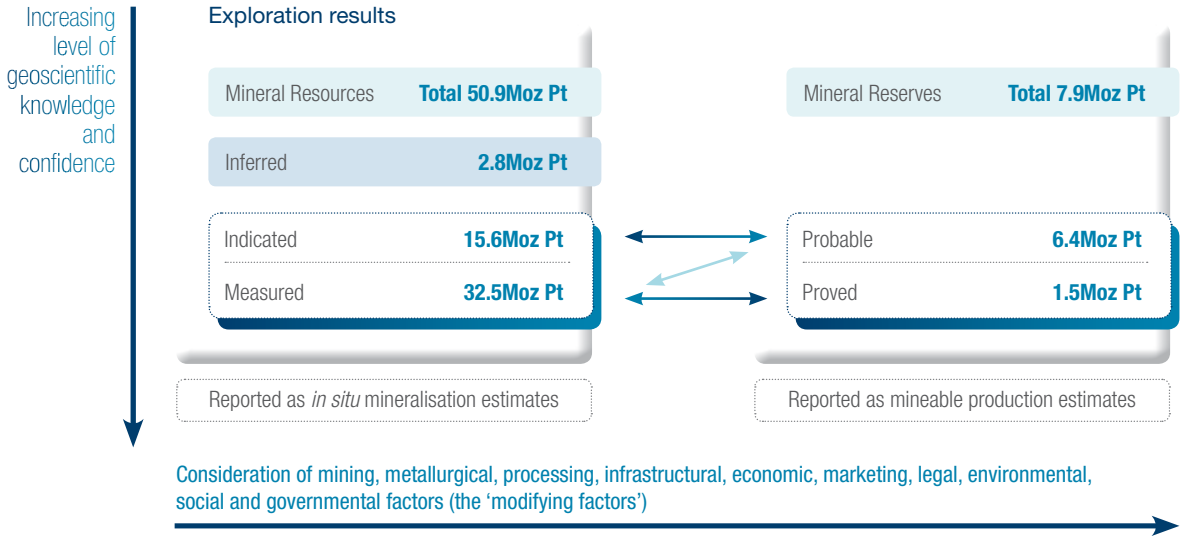
Impala attributable Mineral Resources and Mineral Reserves
as at 30 June 2018



Impala Mineral Reserve distribution as at 30 June 2018

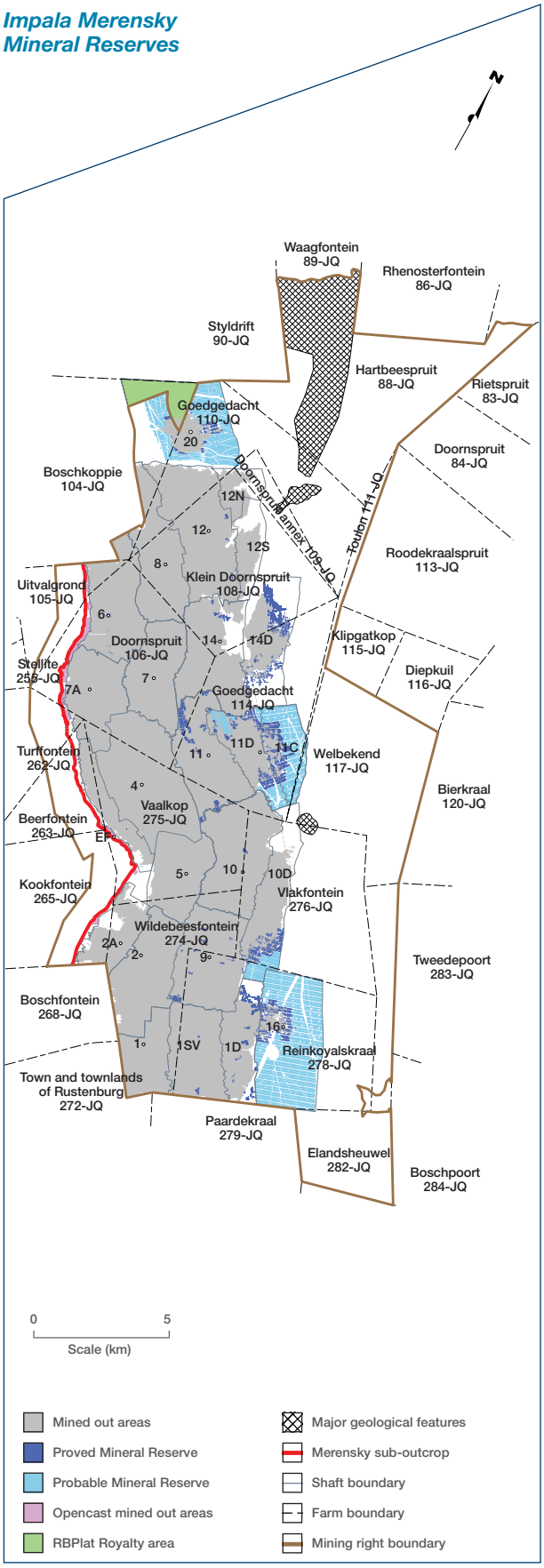


Relationship between exploration results, Mineral Resources and Mineral Reserves (100%)

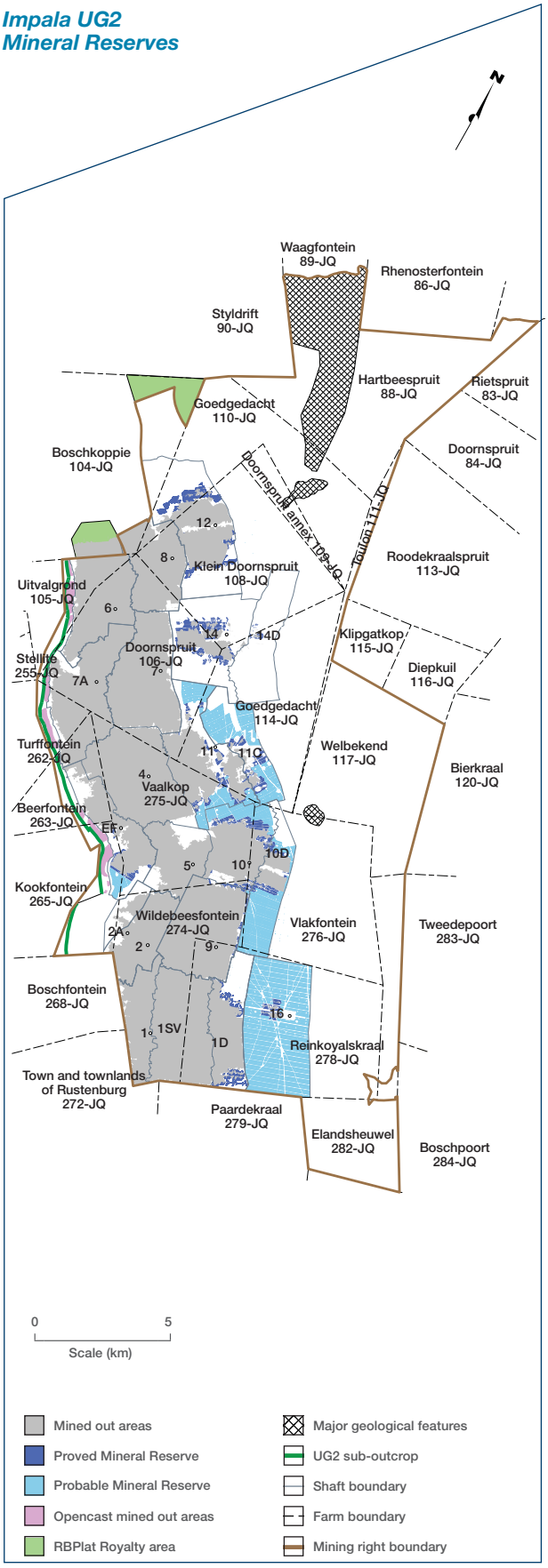


Impala

Impala Merensky Mineral Reserves



Impala UG2 Mineral Reserves



Impala

Processing

Processing receives ore from the shafts which is allocated to either the UG2 plant, for the higher chromium grade material, or the Central Concentrator for Merensky ore. PGMs in Merensky ore is recovered at around 89% at a mass pull of 7.14% utilising 12 primary mills and three secondary units, feeding two, nine stage, tank cell flotation banks. PGMs in UG2 ore is recovered at around 79% at a mass pull of 2.22%. The PGM recovery from UG2 ore is performed utilising a more complex circuit configuration in order to reduce the amount of chromium reporting to the concentrate stream. The MF2 plant, also situated at the Central Concentrator, utilises three primary mills that can accommodate any Merensky ore spill over, as well as UG2 ore. This allows for flexibility in the ore split received from the mining operations, without significantly impacting recovery of valuable material. Tailings from both concentrators is further processed at the Tailings Scavenging plant in order to improve overall performance. UG2 ore tails are also treated at two chromitite recovery plants. The smelter operation treats the concentrate from both the Central Concentrator, UG2 plant, as well as toll material. The concentrate is first dried in order to reduce moisture content to below 0.5%, and is then treated through one of three electric arc furnaces to produce a copper, nickel, iron sulphide rich matte, at a mass pull of around 10%. The remaining 90% produces a low grade furnace slag. The maximum power utilisation capacity of the three furnaces is in the order of 105MW. The furnace matte is then treated in the converter operation which further reduces the tonnage by around 75%, in order to reduce the iron content to below 1%, as per refinery specification. Granulated converter matte is transported to the refinery operations in Springs utilising road infrastructure. Both furnace and converter slag are retreated at the Slag Plant utilising a flotation process. During the smelting operation, off gasses are treated at either the acid plant to produce sulphuric acid, or the sulphuric acid plant which produces gypsum. While these operations do not have a direct value add, they are essential in retaining our operating licence by complying with emissions regulations. The refineries, including both the base metal and precious metal refineries, are located in Springs, east of Johannesburg.

Impala top risks

The Group risk management process is described on page 12 where the top Group risks are listed.

In this context the top additional operations risks identified at Impala in order of priority are:

> Inability to achieve the BP 19 business plan perimeters
> Unfavourable safety performance
> Impact of stakeholder on the ability to execute the 2019 business plan
> Downstream impact of not meeting mining production targets
> Reduced flexibility in processing
> Inability to ramp up new generation shafts
> Deterioration in labour/employee relations climate
> Inability to achieve desired cost savings/increased cost of production
> Failure of critical Infrastructure
> Shortage/disruption of critical reagents.

Valuation

The economic viability of the Impala Mineral Reserves is tested by means of net present value calculations over the LoM of the Mineral Reserve, determining the lowest real rand basket price which would still render the Mineral Reserve viable. These calculations generate basket prices based on the local PGM metal ratios and differs from the overall Group basket prices. This is then tested against the internal Impala estimate of the real long-term basket price and the spot price as at 30 June 2018. These tests indicate that the Impala Operation requires a real long-term basket price of between R23 500 and R24 300 to be economically viable.

The real spot basket price for the Impala operation as at 30 June 2018 was R25 200 (US$1 820) and the Impala internal long-term real basket price is R26 900 (US$2 060). Future investments beyond current infrastructure at Impala will at best be marginal under the price assumptions.

Compliance

Impala has adopted the SAMREC Code for its reporting. The Lead Competent Person for the Impala Mineral Reserves is David Sharpe, a full-time employee of Impala. The Competent Person, PrSciNat SACNASP Registration No: 400018/91, has 30 years' relevant experience. The Lead Competent Person for the Impala Mineral Resources is Johannes du Plessis, also a full-time employee of Impala. The Competent Person, PrSciNat SACNASP Registration No: 4000284/07, has 17 years' relevant experience. Implats has written confirmation from the Lead Competent Persons that the information disclosed in terms of these paragraphs are compliant with the SAMREC Code and, where applicable, the relevant SAMREC Table 1 and JSE Section 12 requirements and that it may be published in the form, format and context in which it was intended.

Impala

Key operating statistics

		FY2018	FY2017	FY2016	FY2015	FY2014
Production						
Tonnes milled ex mine*	(000t)	**10 947**	10 121	10 316	9 199	6 183
Head grade 6E	(g/t)	**4.09**	4.06	4.16	4.19	4.34
Platinum refined	(000 oz)	**581**	655	627	575	411
PGM refined	(000 oz)	**1 127**	1 247	1 220	1 137	766
Cost of sales	(Rm)	**(16 046)**	(17 510)	(16 506)	(14 824)	(12 229)
On-mine operations	(Rm)	**(11 909)**	(11 703)	(10 600)	(10 354)	(6 616)
Processing operations	(Rm)	**(2 997)**	(2 896)	(2 534)	(2 335)	(1 606)
Refining operations	(Rm)	**(689)**	(615)	(571)	(794)	(615)
Other	(Rm)	**(451)**	(2 296)	(2 801)	(1 341)	(3 392)
Total cost	(Rm)	**15 788**	15 411	13 879	13 738	9 057
Per tonne milled*	(R/t)	**1 442**	1 523	1 345	1 493	1 465
	($/t)	**112**	112	93	131	141
Per Pt oz refined	(R/oz)	**27 183**	23 543	22 139	23 884	22 036
	($/oz)	**2 116**	1 726	1 535	2 092	2 125
Financial ratios						
Gross margin ex mine	(%)	**(21)**	(20)	(13)	(11)	(18)
Capital expenditure	(Rm)	**2 767**	2 472	2 490	3 047	2 848
	($m)	**215**	181	173	267	275

** The mined tonnage and grade statistics above exclude the low-grade material from surface sources.*

Support installation in a UG2 stope, 12 Shaft, Impala

Marula

PLATINUM FROM THIS AREA WAS FIRST RECOGNISED BY RENOWNED EXPLORER HANS MERENSKY ON THE NEARBY FARM MAANDAGSHOEK IN 1924. IN JUNE 1998 IMPLATS ENTERED INTO AN ARRANGEMENT TO ACQUIRE THE WINNAARSHOEK PROPERTY FROM PLATEXCO, A CANADIAN-BASED COMPANY.

Location

Marula Mine is located within the Greater Tubatse Local Municipality of the Limpopo province of the Republic of South Africa, approximately 35km northwest of the town of Burgersfort, 120km southeast of Polokwane. The mine is accessible from a well-developed network of national and provincial tarred roads, with the closest public airport located in Polokwane.

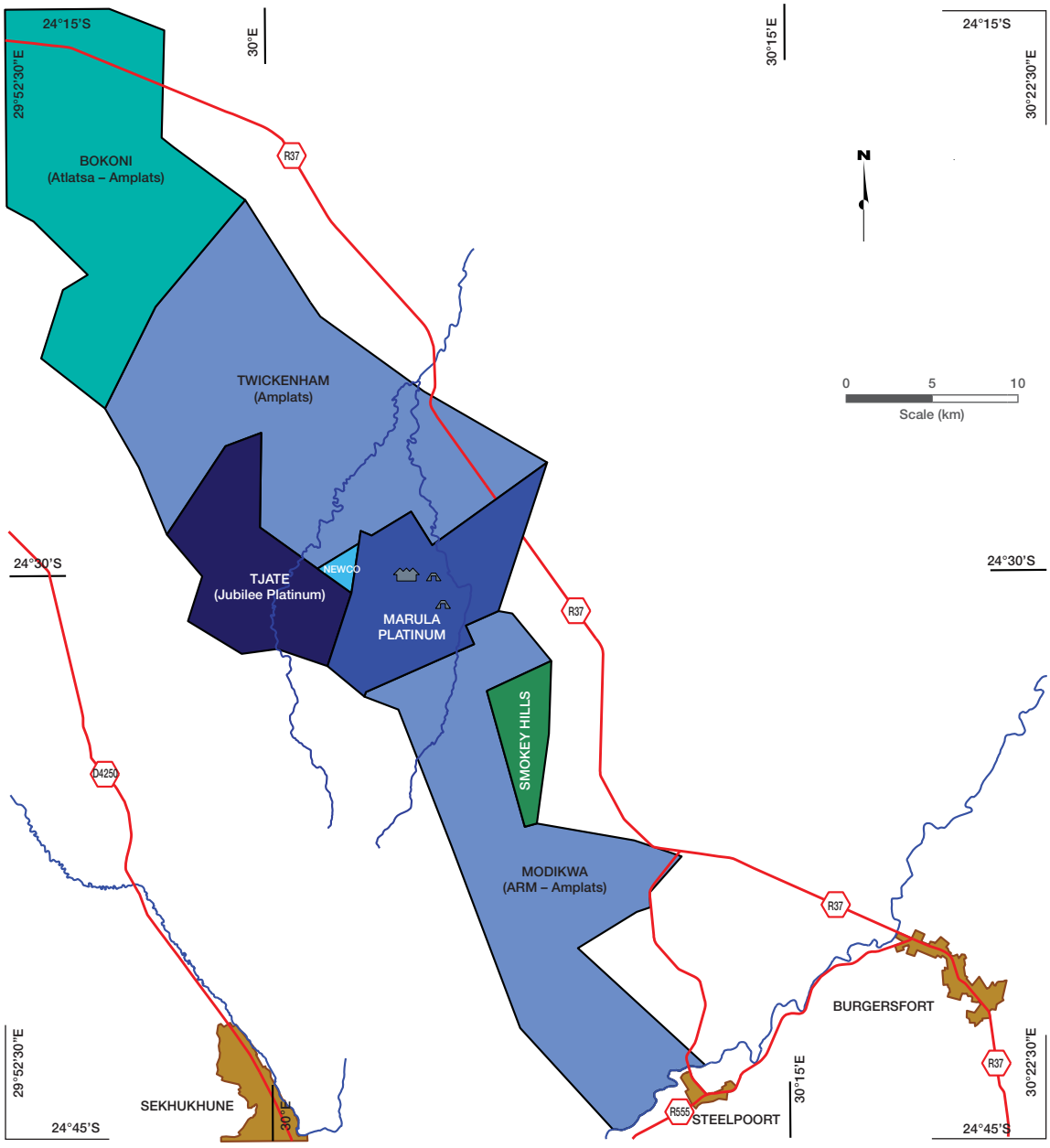
Marula Platinum is situated in the Eastern Bushveld Complex, located south of the Anglo Platinum Twickenham Mine and north of the Anglo Platinum-ARM Modikwa Mine. The western (down-dip) boundary is shared by Jubilee Platinum and its Tjate Project.

Marula

History

Exploration activities, which led to the discovery of PGM mineralisation at the Marula Operations, started in the 1920s, following the discovery of PGMs by Hans Merensky on the nearby Maandagshoek 254KT (now Modikwa Mine). Most of the prospecting activities at that time were prioritised on the Merensky Reef in preference to the UG2 Reef. This early work included trenching, the excavation of adits and sampling of outcrops. In June 1998 Implats entered into an arrangement to acquire the Winnaarshoek property from Platexco, a Canadian-based company. After acquiring Winnaarshoek, the mineral rights to portions of the adjacent farms of Clapham and Forest Hill and a sub-lease to Driekop were subsequently acquired from Anglo Platinum in exchange for Hendriksplaats (now part of Modikwa Platinum Mine), thus consolidating the Marula Mine area. The initial exploration programme commenced in the 1960s by Anglo Platinum. Platexco and Implats explored extensively, with a total of some 750 surface boreholes drilled to date. The establishment and development of the mine commenced in October 2002.

Regional locality map showing PGM mineral rights and infrastructure in the Marula surroundings



Marula

Mineral rights

Marula holds two contiguous mining rights and a prospecting right covering 5 494ha across the farms Winnaarshoek and Clapham, and portions of the farms Driekop, Forest Hill and Hackney. Marula has since submitted an application in terms of Section 11 and 102 of the MPRDA (Mineral and Petroleum Resources Development Act, 2002), with the intention of withdrawing the pending renewal application for the Hackney Prospecting Right. Marula also has a royalty agreement with Modikwa, which allows limited mining on an area adjacent to the Driekop Shaft. These Mineral Resources and Mineral Reserves have not been reflected in the current statement as ownership still rests with Modikwa. Implats has a 73% interest in Marula with each of the three empowerment groupings (Mmakau Mining, the Marula Community Trust and Tubatse Platinum) holding a 9% interest each.

The new-order mining right was awarded for a 30-year period in 2008. In terms of the MPRDA holders of the mining rights may apply for more than one renewal period of a maximum of 30 years each as per the supporting mining work programme, 60 working days before the relevant expiry date.

	Mining right (ha)	Implats' interest (%)
Marula	5 494	73

Infrastructure

The region is well developed, partly due to other mining activities in the vicinity. The R37 tarred road from Burgersfort to Polokwane passes through the area, while a secondary tarred road, built by Marula, links the R37 to the main office and other infrastructure at Marula. The existing mines and villages are supplied with electricity by Eskom.

Marula has an adequate and firm electricity supply and distribution network. The site is supplied by two independent 132kV Eskom power lines. Two 40MVA transformers (one operating and one on standby) convert the voltage to 33kV for surface and underground distribution. Water is provided through the Lebalelo Water Scheme from which Marula has an allocation of 13.8Ml per day, which is more than adequate for planned production levels. Mining infrastructure includes two decline shafts, offices, stores, a concentrator plant, a chromitite recovery plant, a tailings storage facility and overland ore conveyance.

Environmental

Summary details pertaining to the Group environmental management and policy are listed on page 26. This includes the focus areas such as compliance, water stewardship, air quality, managing waste streams and promoting land management practices.

Marula's ISO 14001 certification lapsed in 2017, the operation is currently in the process of being re-certified. In line with our environmental management system expectations, all areas are required to identify and report on environmental incidents. Systems are in place to investigate and determine the direct and root causes of high-severity incidents and to address and close out these incidents. The preliminary design for an additional tailings storage facility is currently under way. An environmental management plan (EMP) for the new facility was approved in 2008. Confirmation that this EMP is valid was obtained from the DMR. Further licensing requirements will be done during the detailed design phase of the project.

Geology

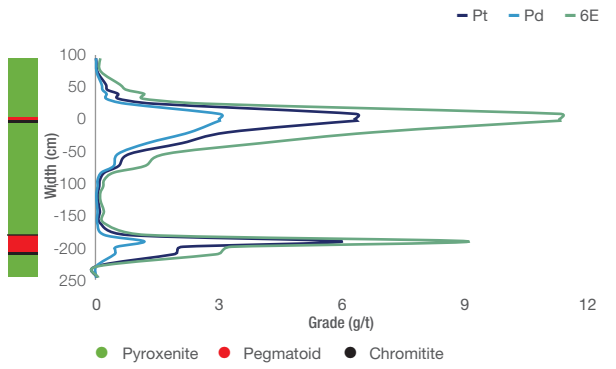
The geological succession is illustrated in the generalised stratigraphic column on page 57. The Merensky and UG2 Reefs are separated by a sequence of mostly anorthositic and noritic layered units of some 400m in combined thickness. Both the Merensky and UG2 Reefs are present but only the UG2 is currently exploited. The geological succession is broadly similar to that of the western limb. The UG2 Reef is defined as a main chromitite layer, with most of the mineralisation confined to this unit, followed by a poorly mineralised pegmatoidal footwall. The Merensky Reef is the upper portion of a pyroxenite layer, with a chromitite stringer close to the hanging wall contact.

Mineralisation peaks over the chromitite stringer and decreases into the hangingwall and footwall. The average 6E metal ratios show the distinct differences between the Merensky and UG2 Reefs, in particular the high proportion of palladium associated with the UG2 at Marula and also the relative high proportion of rhodium in the UG2 Reef, as shown on the next page.

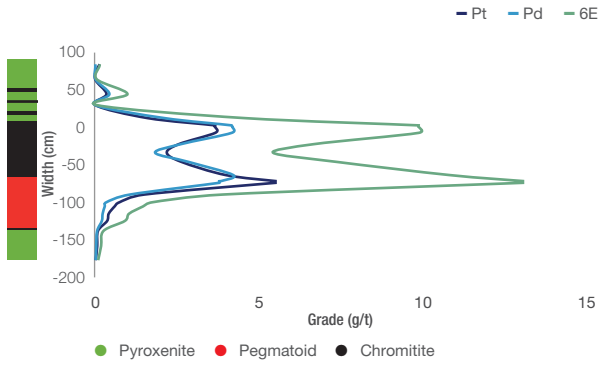
Both mineralised horizons sub-outcrop on the Marula mining rights area and dip in a west-southwest direction at 12° to 14°. The reefs are relatively undisturbed by faults and dykes with one major dolerite dyke traversing the mining area. Potholes represent the majority of the geological losses encountered underground, while a small dunite pipe also disrupts the reef horizons. These geological features are accounted for in the Mineral Resource and Mineral Reserve Statements as geological losses.

Marula

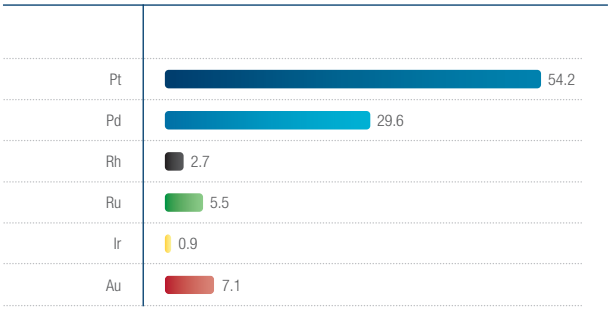
Marula – Merensky



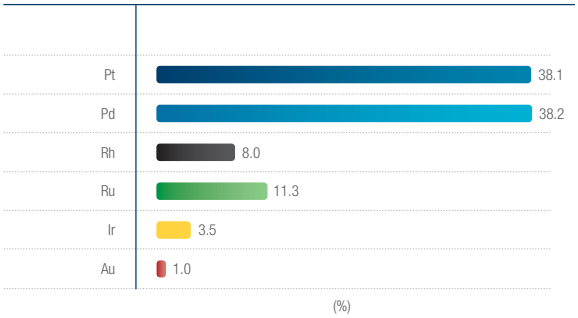
Marula – UG2



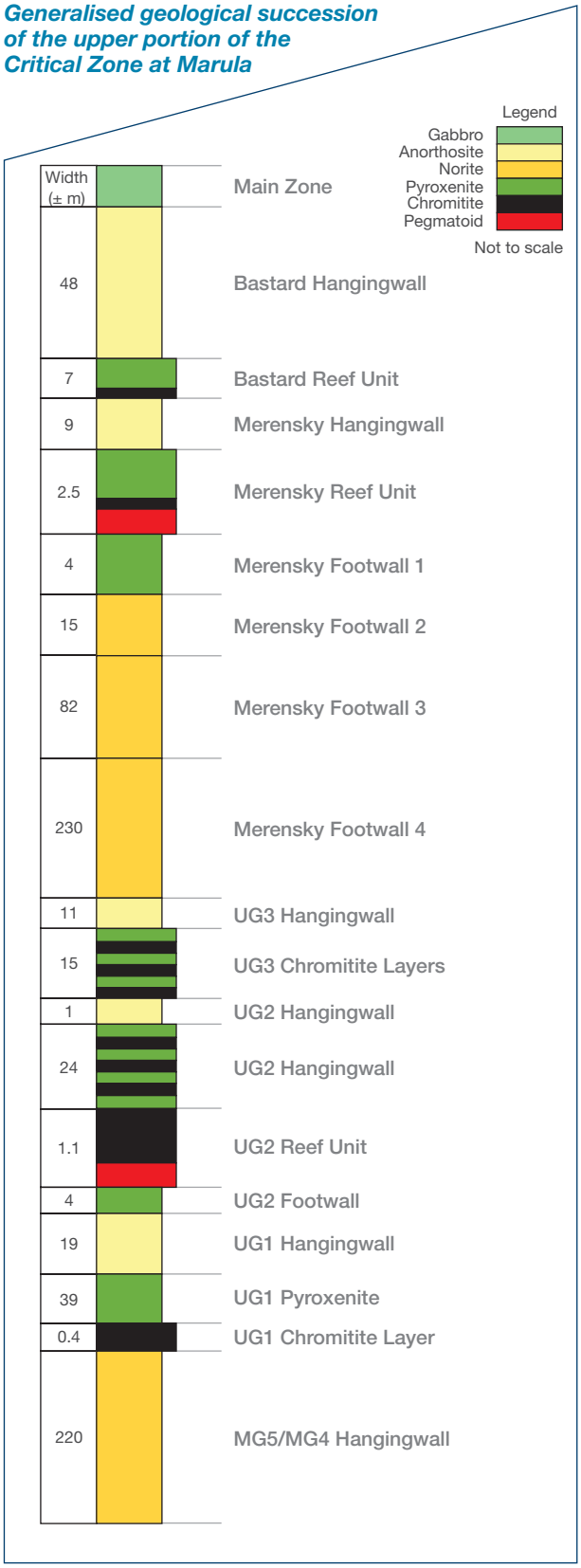
Marula Merensky 6E metal ratio as at 30 June 2018



Marula UG2 6E metal ratio as at 30 June 2018



Generalised geological succession of the upper portion of the Critical Zone at Marula



Marula

Exploration

Exploration activities which led to the discovery of PGMs at Marula Mine started in the 1920s following the recognition of PGMs by Hans Merensky on the nearby Maandagshoek farm (now Modikwa Mine). Follow-up exploration in the 1960s and 1980s by Anglo American Platinum Limited (Anglo Platinum) entailed exploration drilling targeting both the Merensky and the UG2 Reefs. There is limited data relating to these historical explorations initiatives.

Several exploration techniques have been employed at Marula by historical explorers and Implats, with the most notable being surface geological mapping, aeromagnetic surveys and surface exploration drilling. Core drilling is the main drilling technique employed although limited reverse circulation drilling was also undertaken to refine the structural model in areas of potential open-pit mining. Ongoing surface drilling is typically infill work to supplement a broader grid of 500m spacing completed during feasibility stages. Such work is mostly targeted to assist with detailed structural interpretations.

Exploration drilling at Marula

Underground geotechnical core-recovering drilling activities are routinely being undertaken at Marula. This formed part of a proactive safety strategy to detect flammable gas, gas pockets, water-bearing features, possible geological anomalies and related phenomena ahead of current mining operations. Summary statistics pertaining to the work conducted in the past year are summarised in the exploration overview section of this report.

Two surface boreholes were drilled at Marula during the past year. At the two mining shafts at Marula, 111 underground boreholes were drilled, mainly for water cover, as well as geological delineation.

Mineral Resource estimation and reconciliation

The statement on page 59 reflects total estimates for Marula as at 30 June 2018. The corresponding estimated attributable Mineral Resources are summarised on page 27. Note that Mineral Resources are quoted inclusive of Mineral Reserves. Estimated geological losses have been accounted for in the Mineral Resource estimate. Changes in the UG2 and Merensky Mineral Resource estimates since last year reflect an updated estimation using limited additional data. No Inferred Mineral Resources have been converted into Mineral Reserves.

The Mineral Resource estimate for the UG2 Reef is shown at a minimum mining width. The Mineral Resource estimates are reflected in both 4E and 6E formats. Rounding of numbers may result in minor computational discrepancies. Mineral Resource estimates are inherently imprecise in nature and the results tabulated in this report must be read as estimates and not as calculations. Inferred Mineral Resources in particular are qualified as approximations.

The average nickel and copper grades based on exploration samples are 0.20% Ni and 0.11% Cu for the Merensky Reef channel and 0.05% Ni and 0.02% Cu for the UG2 Reef channel.

The estimate has been conducted using the Isatis™ software. A multi-pass search was used for the estimation and capping of extreme values was applied for UG2 Reef data. Estimated losses have been accounted for in the Mineral Resource calculation varying from 18% to 26%, using the geological model, constructed in CADSmine™ software as the basis.

The Mineral Resource classification is based on a Group standard practice that considers the quality of the data, the continuity of the reef, if a seismic survey covers the area or not, the data spacing, and the geostatistical parameters.

Marula

Marula Mineral Resources (inclusive reporting)

as at 30 June 2018

Orebody category		Merensky				UG2				Total
		Measured	Indicated	Inferred	Total	Measured	Indicated	Inferred	Total	
Tonnes	Mt	34.3	7.6	5.2	47.0	50.0	22.4	6.4	78.8	**125.9**
Width	cm	100	100	100		96	102	104		
4E grade	g/t	4.26	4.20	3.82	4.21	6.11	6.18	6.26	6.14	**5.42**
6E grade	g/t	4.56	4.50	4.10	4.50	7.17	7.25	7.34	7.20	**6.19**
Ni	%	0.20	0.19	0.19	0.20	0.04	0.05	0.05	0.05	**0.10**
Cu	%	0.11	0.11	0.10	0.11	0.02	0.02	0.02	0.02	**0.05**
4E oz	Moz	4.7	1.0	0.6	6.4	9.8	4.5	1.3	15.6	**21.9**
6E oz	Moz	5.0	1.1	0.7	6.8	11.5	5.2	1.5	18.3	**25.1**
Pt oz	Moz	2.7	0.6	0.4	3.7	4.4	2.0	0.6	7.0	**10.6**
Pd oz	Moz	1.5	0.3	0.2	2.0	4.4	2.0	0.6	7.0	**9.0**

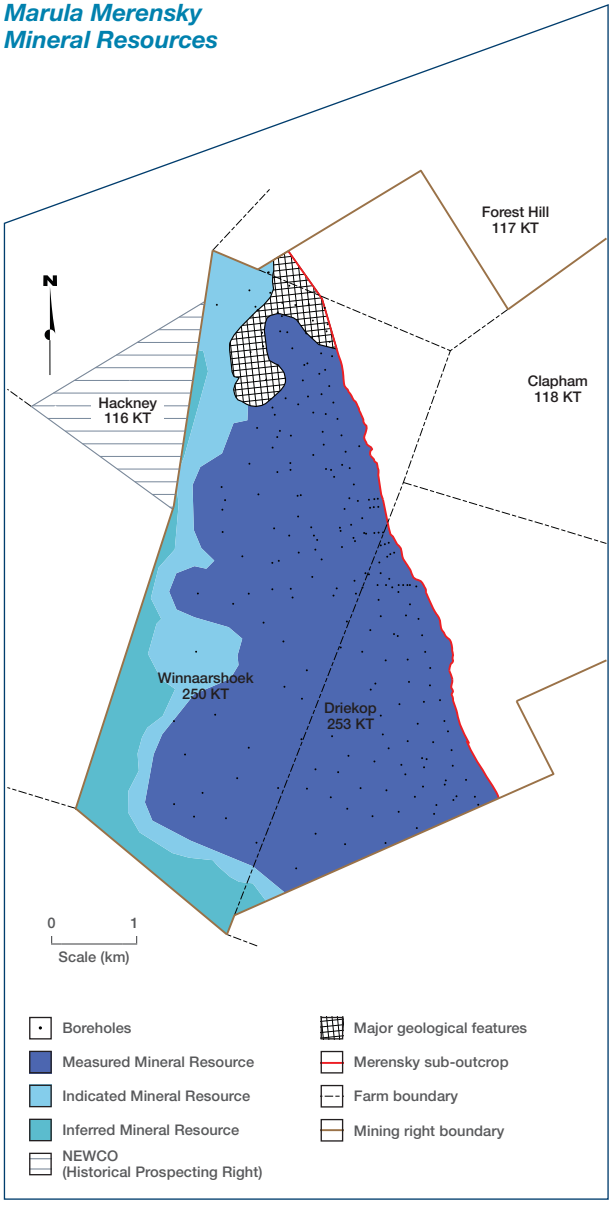
as at 30 June 2017

Orebody category		Merensky				UG2				Total
		Measured	Indicated	Inferred	Total	Measured	Indicated	Inferred	Total	
Tonnes	Mt	34.3	7.6	5.2	47.0	51.2	22.4	6.4	80.0	**127.0**
Width	cm	100	100	100		96	102	104		
4E grade	g/t	4.26	4.20	3.82	4.21	6.13	6.21	6.29	6.17	**5.44**
6E grade	g/t	4.56	4.50	4.10	4.50	7.16	7.25	7.34	7.20	**6.20**
Ni	%	0.20	0.19	0.19	0.20	0.04	0.05	0.05	0.05	**0.10**
Cu	%	0.11	0.11	0.10	0.11	0.02	0.02	0.02	0.02	**0.05**
4E oz	Moz	4.7	1.0	0.6	6.4	10.1	4.5	1.3	15.9	**22.2**
6E oz	Moz	5.0	1.1	0.7	6.8	11.8	5.2	1.5	18.5	**25.3**
Pt oz	Moz	2.7	0.6	0.4	3.7	4.5	2.0	0.6	7.0	**10.7**
Pd oz	Moz	1.5	0.3	0.2	2.0	4.6	2.0	0.6	7.2	**9.2**

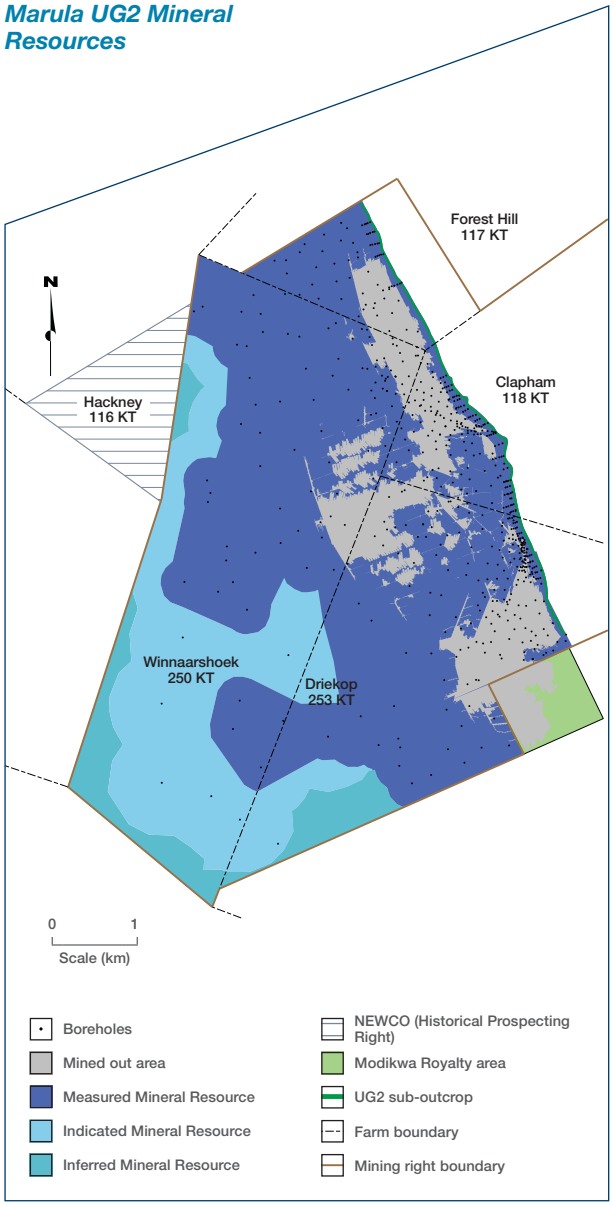
Milling operation

Marula

Marula Merensky Mineral Resources

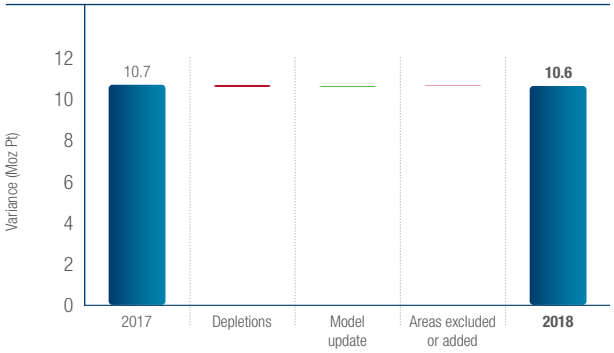


Marula UG2 Mineral Resources



The year-on-year reconciliation of the Marula Mineral Resource estimate shows variations due to mining depletion.

Total Marula Mineral Resources as at 30 June 2018



Marula

Modifying factors

Key modifying factors, such as overbreak, underbreak, off-reef mining, development dimensions, sweepings and mine call factors, are applied to the mining area (centare profile) to generate tonnage and grade profiles. The modifying factors used to convert a Mineral Resource to a Mineral Reserve are derived from historical performance while taking future anticipated conditions into account. Implats' long-term price assumptions in today's money (supporting Mineral Reserve estimates) are shown on pages 5 and 25. Key factors are tabulated below.

Key factors and assumptions

	Merensky Reef factors	UG2 Reef factors
Geological losses	20 – 25%	20 – 25%
Mineral Resource area	15 million ca	21 million ca
Pillar factors	–	10 – 12%
Resource dilution	–	9 – 12%
Mine call factor	–	97 – 100%
Relative density	3.2 – 3.3	3.8 – 3.9
Channel width	100cm	99cm
Stoping width	–	125cm
Concentrator recoveries	–	87 – 88%

Mining methods and mine planning

Marula Mine has two decline shaft systems. Driekop Shaft is exploiting the UG2 Reef by means of a hybrid mining method, while at Clapham Shaft, both a hybrid and conventional mining method are being used to exploit the UG2 Reef. For the two hybrid sections, all main development is done on-reef and the stoping is carried out through conventional single-sided breast mining from a centre gully. Panel face lengths are approximately 16m to 24m, with panels being separated by 6m x 4m grid pillars with 2m ventilation holings. The stoping width averages 125cm. For the conventional operation, the footwall drives are developed on strike approximately 25m below the reef horizon with cross-cut breakaways about 220m apart. This development is undertaken with drill rigs and dump trucks. Stope face drilling takes place with hand-held pneumatic rock drills with air legs.

Mine design and scheduling of the operational shafts is carried out using CADSmine™ software. Geological models and ore blocks are updated and validated using G-Blocks and boundaries in the MRM information system.

Grade block models are developed using Isatis™ software. The planning process starts with the compilation of the LoM plan (August to October) followed by a detailed two-year budget plan (February to April). The spread of Mineral Reserves over the three mining sections is depicted below. The majority of the Mineral Reserves (67%) are located in the Clapham Decline section.

The LoM I encompasses the UG2 Reef Clapham Conventional area up to 5 Level, Driekop Hybrid and Driekop Extension areas. Marula LoM indicates that production will be slightly below two million tonnes per year for the next two years. This is due to the rightsizing of the operation whereby the Hybrid section was stopped and all the Driekop Shaft's loss-making half levels are closed. There are various options to optimise LoM II and III, these are subjects of studies going forward. The comparison between the Mineral Resource Statement and the 20-year LoM profile clearly illustrates Marula's potential to expand operations in future if economically viable. Note that the indicative LoM profile is based on a range of assumptions, which could change in future.

Marula

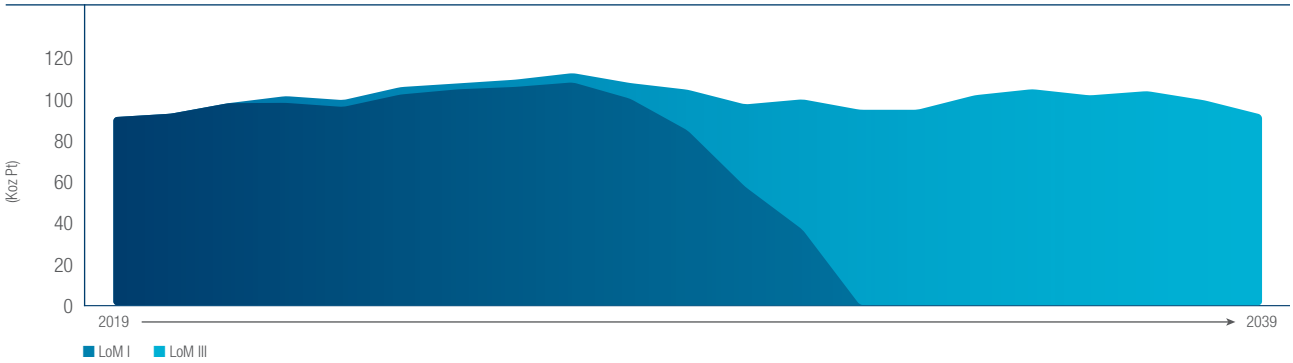
Mineral Reserve estimation and reconciliation

The updated Mineral Reserve estimate for Marula as at 30 June 2018 is tabulated on page 63. The corresponding estimated attributable Mineral Reserves are summarised on page 29. Mineral Reserves quoted reflect the stoping width. The Mineral Reserves quoted reflect the grade delivered to the mill rather than the *in situ* channel grade quoted in respect of the Mineral Resources. The modifying factors used in the UG2 Mineral Reserve estimate are based on the mine plan, which envisages hybrid and conventional breast mining operations.
No Inferred Mineral Resources have been converted into Mineral Reserves. An economic profitability test was conducted at each shaft, in particular also to conduct so-called tail-cutting at the end of a shaft's life.

The Mineral Reserves are reflected in both 4E and 6E formats. Rounding of numbers may result in minor computational discrepancies. The conversion and classification of Mineral Reserves at Marula is informed by:

> Feasible mine plan and project studies, Board approval and available funding
> Economic testing at given market conditions (price deck)
> Measured Mineral Resources are classified as Proved and Probable Mineral Reserves if the mine plan passed economic testing and is approved for funding
> Proved Mineral Reserves are those areas where the main development has been completed and a considerable amount of the geological losses have been discounted
> No Inferred Mineral Resources are converted to the Mineral Reserve category.

Marula 20-year LoM Pt ounce profile as at 30 June 2018 (in concentrate)

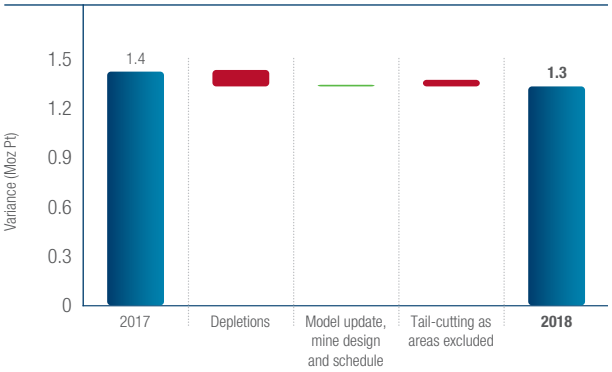


Underground travelling way excavation

Marula

There is no material change in the Mineral Reserve estimate when compared with the June 2017 statement. The variances can be attributed to normal mining depletions, local geological impact and updated mine design in selected areas as well as tail-cutting.

Total Marula Mineral Reserves as at 30 June 2018



Marula Mineral Reserves

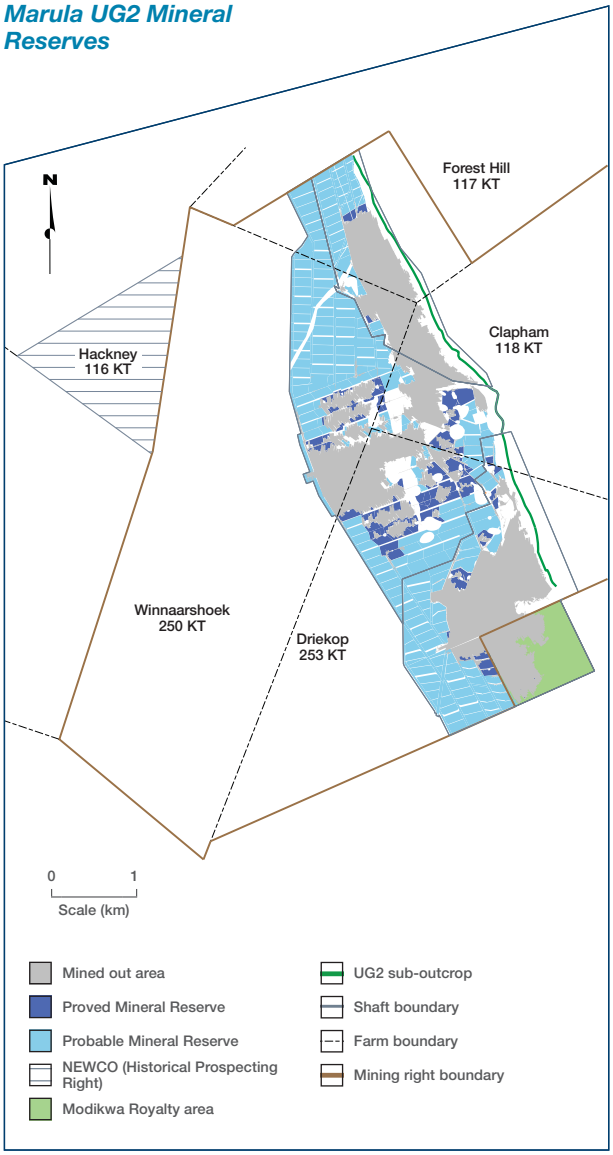
as at 30 June 2018

Orebody category		UG2 Proved	UG2 Probable	Total
Tonnes	Mt	2.8	19.5	**22.3**
Width	cm	126	125	
4E grade	g/t	4.50	4.12	**4.17**
6E grade	g/t	5.28	4.83	**4.89**
4E oz	Moz	0.4	2.6	**3.0**
6E oz	Moz	0.5	3.0	**3.5**
Pt oz	Moz	0.2	1.2	**1.3**
Pd oz	Moz	0.2	1.2	**1.3**

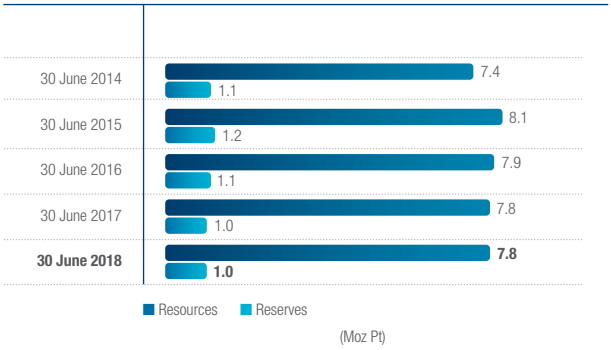
as at 30 June 2017

Orebody category		UG2 Proved	UG2 Probable	Total
Tonnes	Mt	4.3	20.8	**25.1**
Width	cm	134	132	
4E grade	g/t	4.13	3.95	**3.98**
6E grade	g/t	4.82	4.62	**4.65**
4E oz	Moz	0.6	2.6	**3.2**
6E oz	Moz	0.7	3.1	**3.8**
Pt oz	Moz	0.3	1.2	**1.4**
Pd oz	Moz	0.3	1.2	**1.5**

Marula UG2 Mineral Reserves



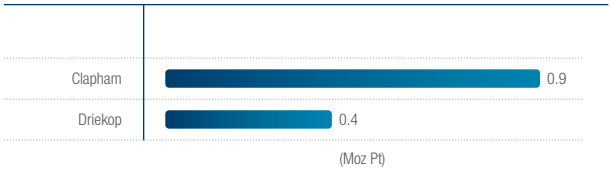
Marula attributable Mineral Resources and Mineral Reserves
as at 30 June 2018



Marula

The distribution of the Mineral Reserves is depicted in the accompanying graph. It is clear that a significant proportion of the Mineral Reserves are located in the Clapham Shaft.

Marula Mineral Reserve distribution as at 30 June 2018



Processing

Marula has a concentrator plant where initial processing is conducted. Concentrate is transported by road to Impala's Mineral Processes in Rustenburg in terms of a LoM offtake agreement with Impala.

Marula top risks

The Group risk management process is briefly described on page 12, where the top 10 Group risks are listed.

In this context the top additional risks identified at Marula are:

> Business interruption due to community unrest
> Failure to achieve production targets
> Unit costs above target
> Labour unavailability
> Disruption and long-term sustainability of water supply
> Capital constraints especially to build the new tailings storage facility
> Regulatory non-compliance
> Failure to improve on environmental performance
> Inability to retain key/critical skills
> Inability to achieve SLP commitments.

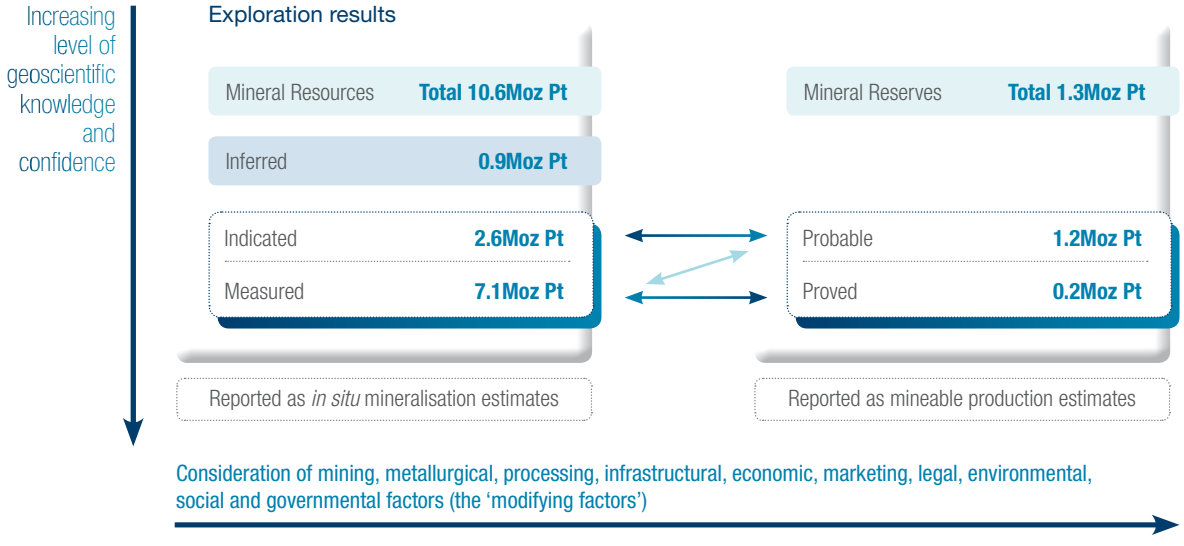
Valuation

The economic viability of the Marula Mineral Reserves is tested by means of net present value calculations over the LoM of the Mineral Reserve, determining the lowest real rand basket price that would still render the Mineral Reserve viable. These calculations generate basket prices based on the local PGM metal ratios and differs from the overall Group basket prices. This is then tested against the internal Marula estimate of the real long-term basket price and the spot price as at 30 June 2018. These tests indicate that the Marula operation requires a real long-term basket price of between R25 200 and R26 000 to be economically viable. The real spot basket price for the Marula operations as at 30 June 2018 was R28 910 (US$2 100) and the Marula internal long-term real basket price is R30 310 (US$2 330).

Compliance

Marula has adopted the SAMREC Code for its reporting. The Lead Competent Person for Marula's Mineral Resources and Mineral Reserves is Sifiso Mthethwa, a full-time employee of Marula. The Competent Person, PrSciNat SACNASP Registration No: 400163/13, has 15 years' relevant experience. Implats has written confirmation from the Lead Competent Person that the information disclosed in terms of these paragraphs are compliant with the SAMREC Code and, where applicable, the relevant SAMREC Table 1 and JSE Section 12 requirements, and that it may be published in the form, format and context in which it was intended.

Relationship between exploration results, Mineral Resources and Mineral Reserves (100%)



Marula

Key operating statistics

		FY2018	FY2017	FY2016	FY2015	FY2014
Production						
Tonnes milled ex mine	(000t)	**1 838**	1 495	1 703	1 662	1 794
Head grade 6E	(g/t)	**4.33**	4.26	4.25	4.19	4.19
Platinum in concentrate	(000 oz)	**85.1**	67.9	77.7	73.6	78.5
PGM in concentrate	(000 oz)	**223.5**	177.6	204.6	193.3	206.4
Cost of sales	(Rm)	**(2 310)**	(2 202)	(2 076)	(1 856)	(1 803)
On-mine operations	(Rm)	**(1 870)**	(1 810)	(1 669)	(1 469)	(1 371)
Concentrating operations	(Rm)	**(247)**	(212)	(206)	(193)	(188)
Other	(Rm)	**(193)**	(180)	(201)	(194)	(244)
Total cost	(Rm)	**2 117**	1 988	1 875	1 662	1 559
Per tonne milled	(R/t)	**1 152**	1 330	1 101	1 000	869
	($/t)	**90**	98	76	88	84
Per Pt oz in concentrate	(R/oz)	**24 877**	29 278	24 131	22 582	19 860
	($/oz)	**1 936**	2 147	1 673	1 978	1 915
Financial ratios						
Gross margin ex mine	(%)	**2.0**	(36.3)	(23.7)	(13.4)	(0.7)
Capital expenditure	(Rm)	**101**	113	89	145	161
	($m)	**8**	8	6	13	16

Underground borehole core

Two Rivers

TWO RIVERS PLATINUM MINE IS LOCATED WITHIN THE SOUTHERN SECTOR OF THE EASTERN LIMB OF THE BUSHVELD COMPLEX.

Location

The mine is located on the farm Dwarsrivier 372KT and extends to portions of the farms Kalkfontein 367KT and Tweefontein 360KT and the farm Buffelshoek 368KT. The mine is situated at longitude 30°07'E and latitude 24°59'S, approximately 30 kilometres from Steelpoort and 60 kilometres from Lydenburg, Mpumalanga province, South Africa. Two Rivers Platinum Mine is neighboured by Mototolo Platinum Mine (Glencore/Amplats) and Dwarsrivier, Tweefontein and Thorncliffe chromite mines.

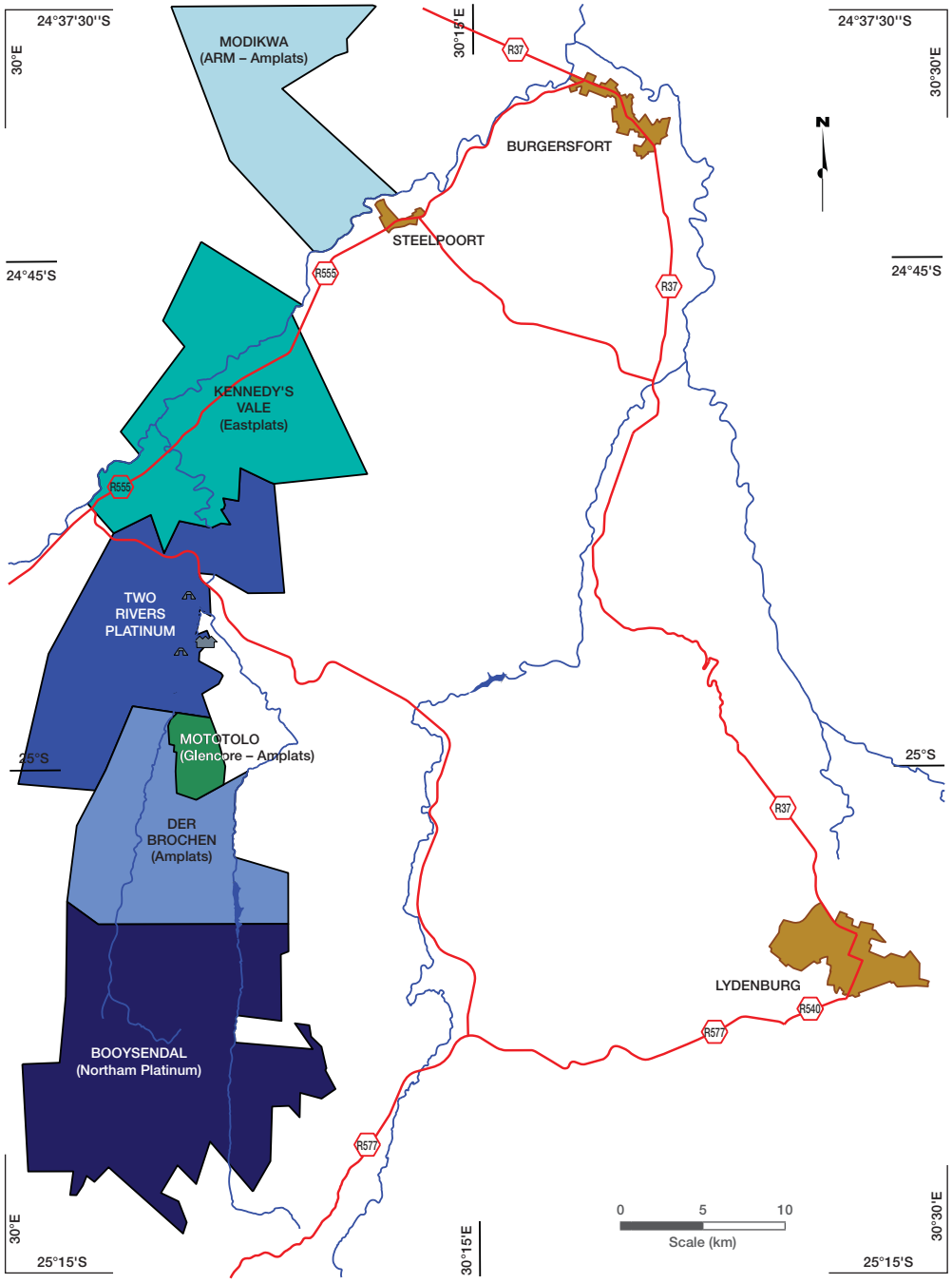
Two Rivers

History

During 2001, Assmang elected to dispose of its platinum interests at the Dwarsrivier Chrome Mine. Two Rivers, the incorporated joint venture between Avmin and Implats, secured the platinum rights in December 2001.

Subsequent corporate activity involving Avmin, African Rainbow Minerals (ARM) and Harmony resulted in the transfer of Avmin's share in Two Rivers to a new, empowered platinum entity, ARM Platinum, a division of ARM. The joint venture partners began development of the Two Rivers project in June 2005. The concentrator plant was commissioned in 2006 and in 2008 the mine successfully made the transition from a project to a mechanised operation.

Regional locality map showing PGM mineral rights and infrastructure in the Two Rivers surroundings



Two Rivers

Mineral rights

The operation is managed by ARM and Implats has a 46% stake in the joint venture. Two Rivers was granted a new-order mining right in 2013 over 2 140ha on the western portion of the farm Dwarsrivier. The mining rights were awarded for a 25-year period at which time the MPRDA allows for an extension. In 2015, portions 4, 5 and 6 of the adjoining farm, Kalkfontein, as well as portions of the farm Tweefontein held by Impala, were incorporated into the Two Rivers mining right. An agreement was also reached for the remaining Implats-owned mineral rights on portions of the farm Kalkfontein and the farm Buffelshoek in exchange for a royalty payment.

The transfer of the additional Tamboti area on the RE portion of the farm Kalkfontein was concluded in November 2017. This impacted positively on the Mineral Resource and Mineral Reserve estimate for Two Rivers. In terms of the agreement the shareholding of Implats in Two Rivers reduced from 49% to 46%.

	Mining right (ha)	Implats' interest (%)
Two Rivers	11 349	46

Infrastructure

The tarred access road constructed by Two Rivers to the mine is in a good condition and well maintained. The nearest railway station at Steelpoort is 28km from the mine.

Two Rivers has a Water Use Licence (WUL) to obtain its water from the Groot and Klein Dwars Rivers and from underground dewatering. The annual WUL (January to December) allocation is 2 926Ml. Electricity is obtained from Eskom via one of two 40MVA transformers at the Uchoba sub-station, which are fed from a 132kV line from the Merensky sub-station.

Mining infrastructure includes two decline shafts, offices, stores, a concentrator plant, a chromitite recovery plant, tailings storage facility and overland ore conveyance.

Environmental

Two Rivers is currently ISO 14001 certified. Environmental management activities include monitoring the status of Environmental Management Programme Reports (EMPRs), WUL applications and Environmental Impact Assessments (EIAs).

Geology

The geological succession is illustrated in the generalised stratigraphic column on page 69. The Merensky and UG2 Reefs are separated by a sequence of mostly anorthositic and noritic layered units of some 140m to 160m in combined thickness. Both the Merensky and UG2 Reefs are present but only the UG2 is currently exploited. However, no Merensky Reef is present on Tweefontein and the UG2 Reef only occurs on a small portion of this farm. The UG2 Reef outcrops in the Klein Dwarsrivier valley over a north-south strike of 7.5km and dips to the west at 7° to 10°. Due to the extreme topography, the Merensky Reef outcrops further up the mountain slope.

The topography also means that the UG2 occurs at approximately 1 650m below surface on the southwestern boundary. The geological succession is broadly similar to other areas of the eastern limb of the Bushveld Complex. An exception is the presence of the Steelpoortpark granite in the southwestern part of the project, which is unique to this area. Three distinct reef types have been defined for the UG2 Reef, namely the 'normal' reef with a thick main chromitite layer; a 'split' reef characterised by an internal pyroxenite/norite lens within the main chromitite layer; and a 'multiple split' reef with numerous pyroxenite/norite lenses occurring within the main chromitite layer. The multiple split reef predominates in the southern portion of the mining area. The Merensky Reef is a pyroxenite layer with a chromitite stringer close to the hangingwall contact and also at the basal contact. Mineralisation is primarily associated with the upper and lower chromitite stringers. The graphical illustration of the profiles is shown on the next page.

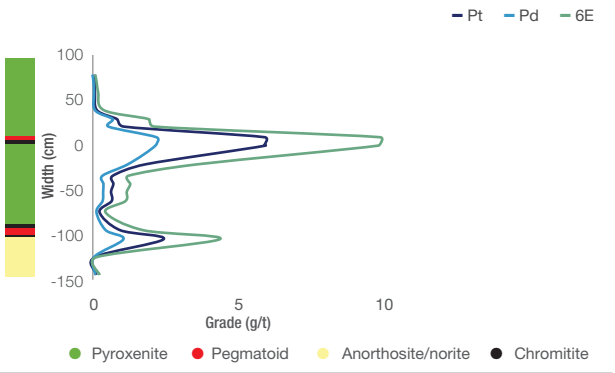
The geological structure of the area is dominated by the regional north-northeast to south-southwest trending Kalkfontein fault, which has an apparent vertical displacement of 1 200m down throw to the west. A series of sub-parallel faults occur to the south-east adjacent to the Kalkfontein fault, which affect both the Merensky and UG2 Reefs. These faults exhibit variable apparent vertical displacements of between 20m and 110m.

Exploration

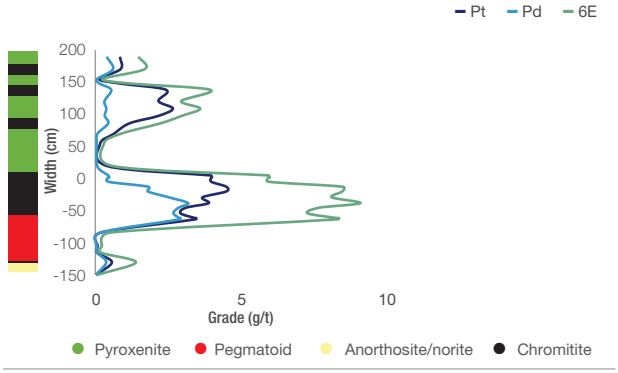
Surface exploration drilling approach is to address the paucity of historical drilling on the farm Buffelshoek 368KT and to conduct a phased surface infill drilling programme to further evaluate the Merensky and UG2 Reefs which are both currently classified as Inferred Resources. During FY2018 17 boreholes were drilled on the farm Buffelshoek and Tweefontein for a total of 10 269m at an all-inclusive exploration cost of R11.73 million. Cover and geological delineation drilling was done from underground. In total 119 boreholes were drilled underground (9 520m) at a cost of R5.08 million. Exploration drilling planned for FY2019 includes an additional 13 boreholes on the farms Kalkfontein and Tweefontein and 171 underground boreholes for cover and geological delineation drilling.

Two Rivers

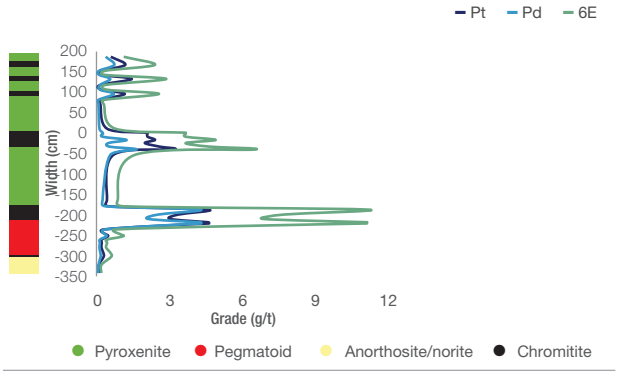
Two Rivers – Merensky



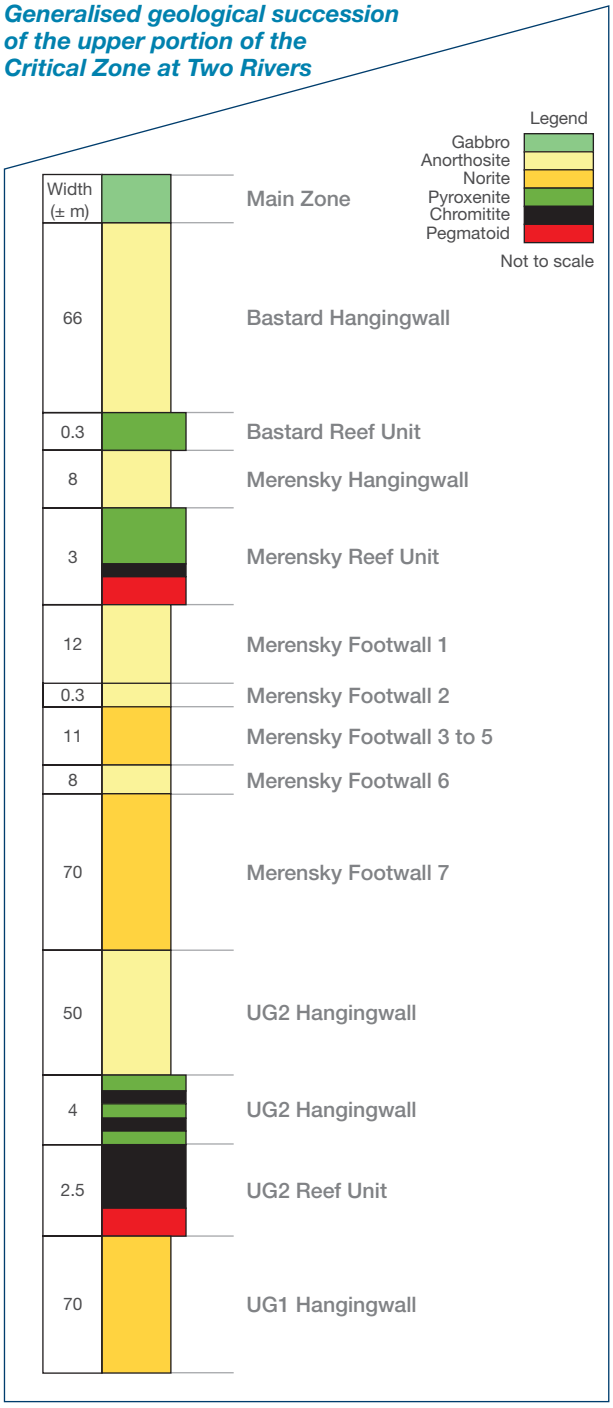
Two Rivers – UG2 (normal)



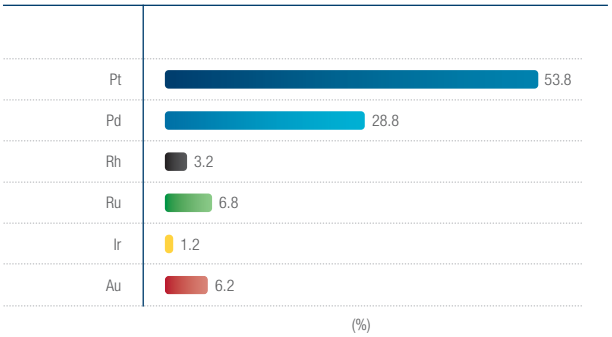
Two Rivers – UG2 (split)



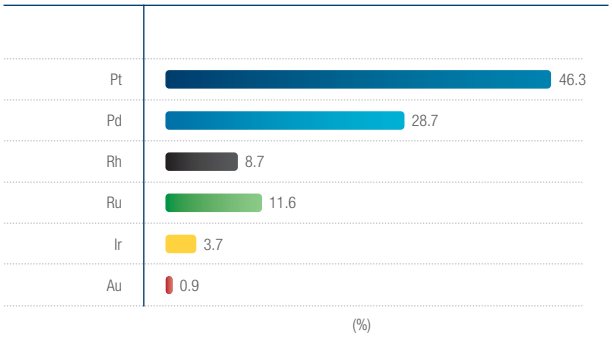
Generalised geological succession of the upper portion of the Critical Zone at Two Rivers



Two Rivers Merensky 6E metal ratio as at 30 June 2018



Two Rivers UG2 6E metal ratio as at 30 June 2018



Two Rivers

Mineral Resource estimation and reconciliation

The updated Mineral Resource estimates are tabulated below and reflect total estimates for Two Rivers as at 30 June 2018. Corresponding estimated attributable Mineral Resources are summarised on page 27 📄. Mineral Resources are quoted inclusive of Mineral Reserves and estimated geological losses have been accounted for in the Mineral Resource calculation. Grade estimates were obtained by means of ordinary kriging of UG2 and Merensky Reef borehole intersections. The Merensky Reef model has not been updated in the past three years and the reported estimates are the same as at 30 June 2015.

The Mineral Resources classification for UG2 and Merensky is based on several factors. These include the geological and grade continuity, borehole spacing, geostatistical parameters and the historical classification.

Rounding of numbers may result in minor computational discrepancies. Mineral Resource estimates are inherently imprecise in nature. The results tabulated in this report must be read as estimates and not as calculations. Inferred Mineral Resources in particular are qualified as approximations.

More information regarding the Mineral Resources and Mineral Reserves can be found in the 2018 ARM annual report.

Two Rivers Mineral Resources (inclusive reporting)

as at 30 June 2018

Orebody category		Merensky			UG2				
		Indicated	Inferred	Total	Measured	Indicated	Inferred	Total	Total
Tonnes	Mt	75.0	104.7	179.7	13.1	80.1	80.4	173.6	**353.2**
Width	cm	214	149		151	152	116		
4E grade	g/t	3.06	3.59	3.37	4.54	4.69	4.77	4.72	**4.03**
6E grade	g/t	3.34	3.90	3.66	5.50	5.63	5.69	5.65	**4.64**
Ni	%	0.14	0.14	0.14	0.04	0.04	0.04	0.04	**0.09**
Cu	%	0.08	0.09	0.08	0.01	0.01	0.01	0.01	**0.05**
4E oz	Moz	7.4	12.1	19.5	1.9	12.1	12.3	26.3	**45.8**
6E oz	Moz	8.0	13.1	21.2	2.3	14.5	14.7	31.5	**52.7**
Pt oz	Moz	4.4	7.0	11.4	1.1	6.5	6.5	14.1	**25.5**
Pd oz	Moz	2.3	3.8	6.1	0.6	4.2	4.5	9.4	**15.4**

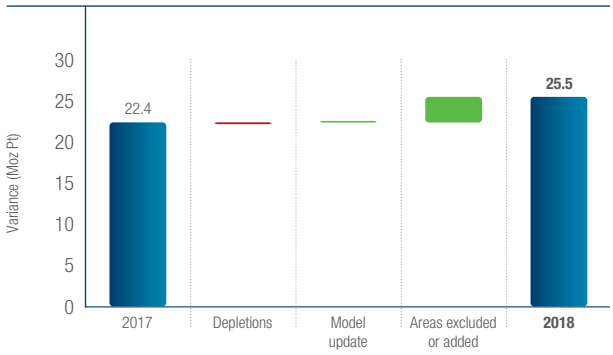
as at 30 June 2017

Orebody category		Merensky			UG2				
		Indicated	Inferred	Total	Measured	Indicated	Inferred	Total	Total
Tonnes	Mt	60.6	99.2	159.8	14.4	62.0	80.6	157.1	**316.8**
Width	cm	229	148		146	163	114		
4E grade	g/t	2.85	3.61	3.32	4.44	4.36	4.73	4.56	**3.93**
6E grade	g/t	3.11	3.92	3.61	5.43	5.28	5.60	5.46	**4.53**
Ni	%	0.13	0.14	0.14	0.04	0.05	0.05	0.05	**0.09**
Cu	%	0.08	0.09	0.08	0.01	0.01	0.01	0.01	**0.05**
4E oz	Moz	5.5	11.5	17.1	2.1	8.7	12.3	23.0	**40.1**
6E oz	Moz	6.1	12.5	18.6	2.5	10.5	14.5	27.6	**46.1**
Pt oz	Moz	3.3	6.7	9.9	1.2	4.7	6.5	12.4	**22.4**
Pd oz	Moz	1.7	3.7	5.4	0.7	3.0	4.4	8.1	**13.5**

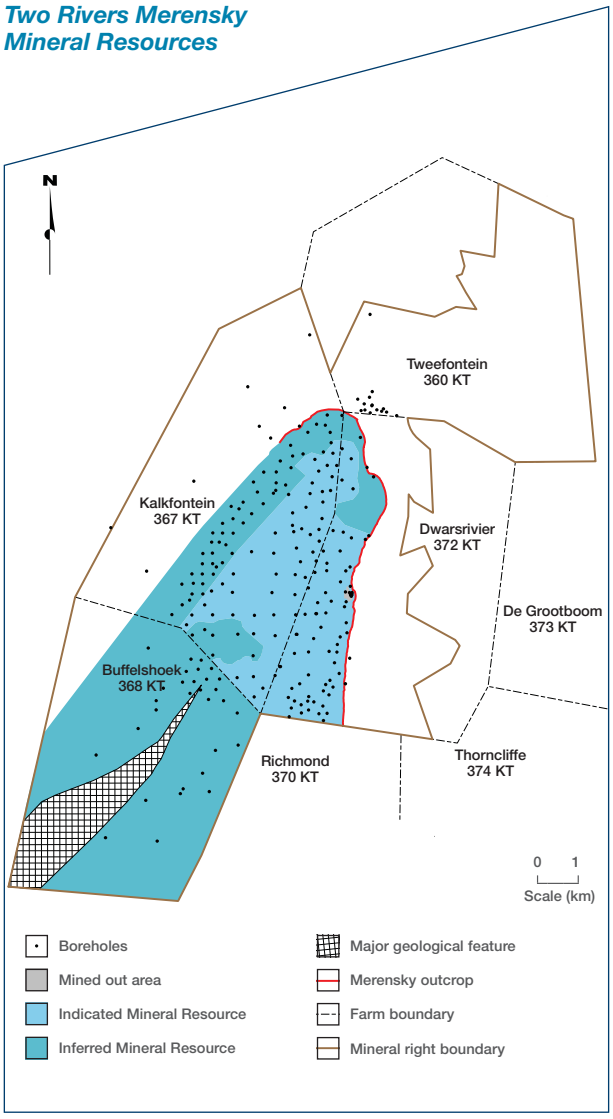
Two Rivers

The year-on-year comparisons indicate that there has been a change since the 30 June 2017 statement; the main change can be attributed to the inclusion of the Kalkfontein RE portion. The year-on-year reconciliation of the total Two Rivers Mineral Resources is depicted in the accompanying graph.

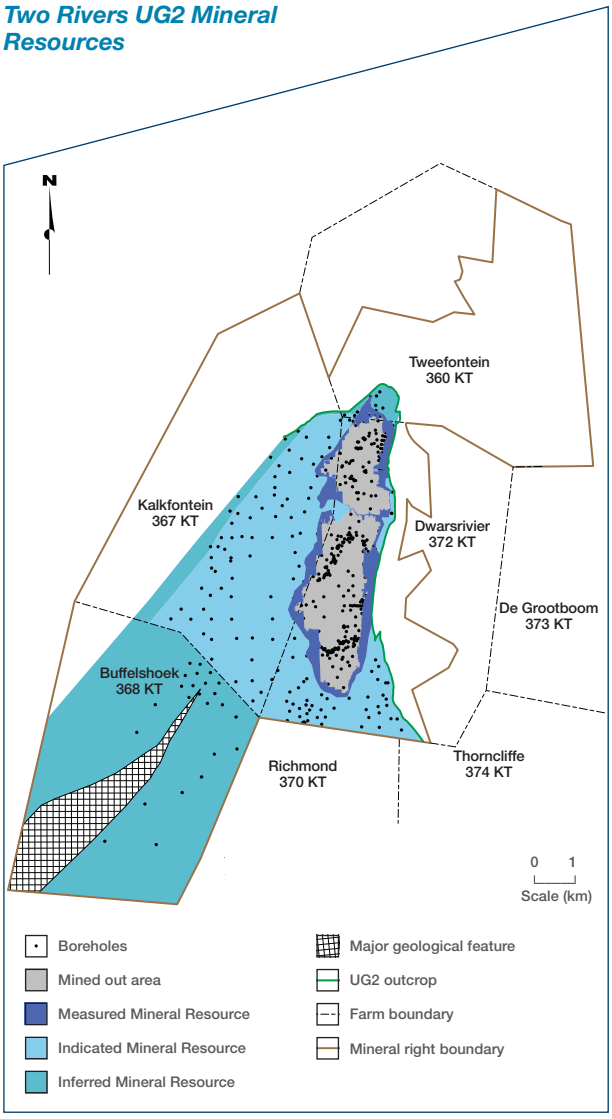
Total Two Rivers Mineral Resources as at 30 June 2018



Two Rivers Merensky Mineral Resources



Two Rivers UG2 Mineral Resources



Two Rivers

Modifying factors

The modifying factors used to convert Mineral Resources to Mineral Reserves are derived from historical performance while taking future anticipated conditions into account. Implats' long-term assumptions in today's money (supporting Mineral Reserve estimates) are shown on pages 5 and 25. The following other modifying factors were applied to the Mineral Resources:

Key factors and assumptions

	Merensky Reef factors	UG2 Reef factors
Geological losses	30%	25 – 27%
Mineral Resource area in centares (ca)	49 million ca	49 million ca
Pillar factors	–	15 – 25%
Resource dilution	–	26 – 30%
Mine call factor	–	99%
Relative density	3.2 – 3.3	3.6 – 3.8
Channel width	179cm	136cm
Stoping width	–	249cm
Concentrator recoveries	–	86.4 – 87.6%

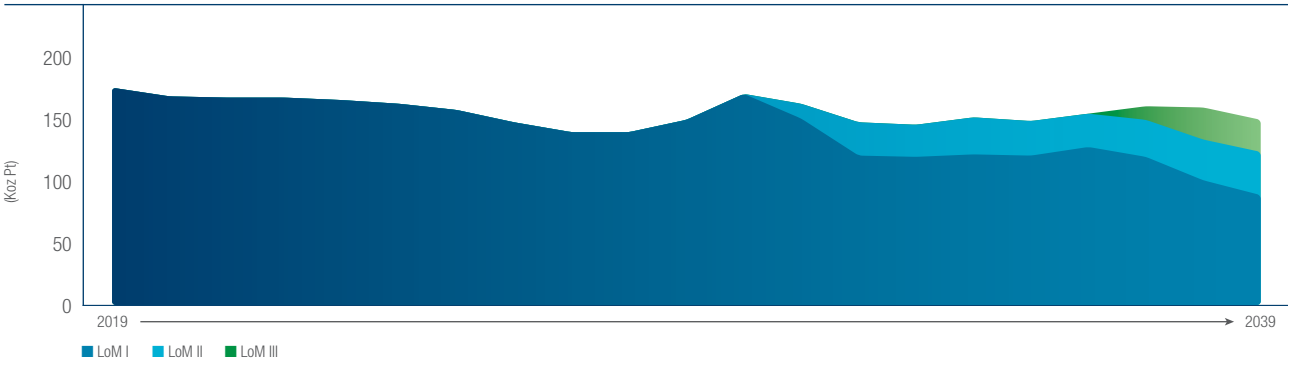
Mining methods and mine planning

The UG2 orebody is accessed via two decline shaft systems situated 3km apart, namely the Main Decline and the North Decline. Reef production is through a fully mechanised bord and pillar stoping method. A mining section consists of 8m to 12m bords, with pillar sizes increasing with depth below surface. In the shallow areas up to 100m below surface, the pillars are 6m x 6m to 12m x 12m in size. The bords are mined mainly on strike.

A 3D geological model with layer grades and widths per stratigraphic unit is used in the mine planning. The mine scheduling of the two declines is done in Datamine Studio 5D Planner™. The schedule is evaluated against the grade and thickness block model. The three distinct reef types impact significantly on the mine plan.

Dilution calculations are based on the specific reef type. Hangingwall and footwall overbreak, percentage off-reef, ore remaining (mining losses), geological losses (potholes, faults, dykes and replacement pegmatoid) and a shaft call factor are applied to the planned areas to generate the tonnage and grade profiles.

Two Rivers 20-year LoM Pt ounce profile as at 30 June 2018 (in concentrate)



The 20-year profile of Two Rivers is shown above. LoM I constitutes production from the Main and North Decline Shafts. LoM II is an extension of the Main Decline infrastructure into the Kalkfontein Fault Blocks 1 and 2. The UG2 at Buffelshoek is included in LoM III. The profile is based on assumptions and may change in future. Trial mining and a feasibility study was conducted in 2012/13 on the Merensky Reef. This is on hold as full-scale mining of the Merensky Reef is not economically viable at present. No feasibility study has been concluded in the past year.

Two Rivers

Mineral Reserve estimation and reconciliation

The updated Mineral Reserve estimates reflect total estimates for Two Rivers as at 30 June 2018. Corresponding estimated attributable Mineral Reserves are summarised on page 29.

Mineral Reserves quoted reflect the width and grade delivered to the mill rather than an *in situ* channel grade quoted in respect of the Mineral Resources. The modifying factors used in the UG2 Mineral Reserve estimate are based on the mine plan, which envisages a mechanised bord and pillar layout. No Inferred Mineral Resources have been converted into Mineral Reserves. The Mineral Reserves are reflected in both 4E and 6E formats.

Rounding of numbers may result in minor computational discrepancies. Mineral Resource estimates are inherently imprecise in nature. The results tabulated in this report must be read as estimates and not as calculations. Inferred Mineral Resources in particular are qualified as approximations. More details regarding the Mineral Resources and Mineral Reserves can be found in the 2018 ARM annual report.

The conversion and classification of Mineral Reserves at Two Rivers is informed by:

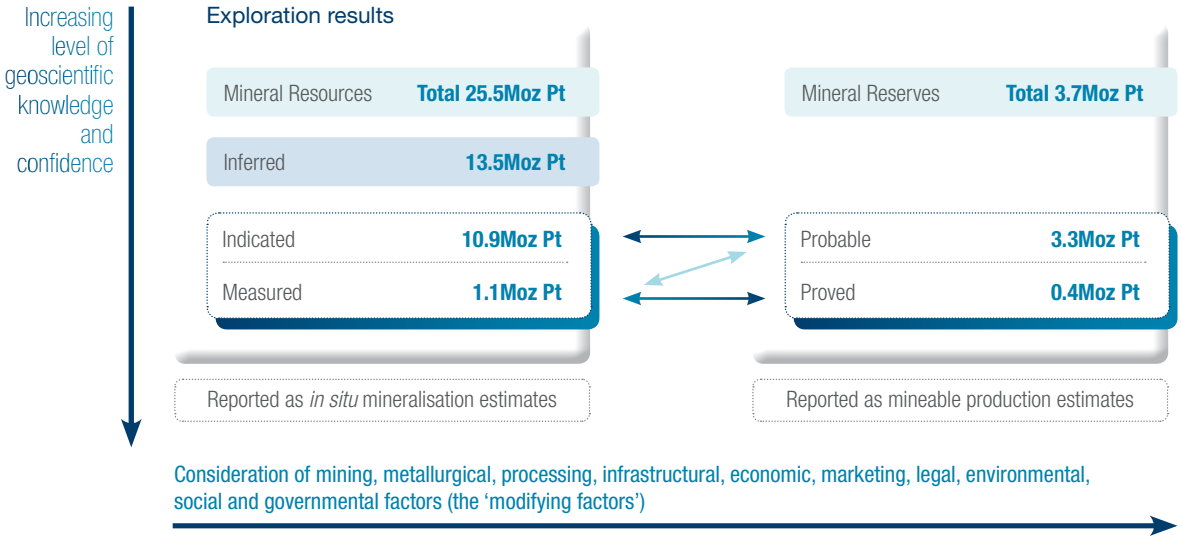
> Economic testing at given market conditions (price deck)
> Most of the Indicated Mineral Resources can be classified as Probable Mineral Reserves
> Most of the Measured Mineral Resources can be classified as Proved Mineral Reserves.

Two Rivers Mineral Reserves

as at 30 June 2018				
Orebody category		**UG2**		
		Proved	**Probable**	**Total**
Tonnes	Mt	8.3	62.7	**71.0**
Width	cm	256	249	
4E grade	g/t	3.03	2.96	**2.97**
6E grade	g/t	3.61	3.49	**3.50**
4E oz	Moz	0.8	6.0	**6.8**
6E oz	Moz	1.0	7.0	**8.0**
Pt oz	Moz	0.4	3.3	**3.7**
Pd oz	Moz	0.3	2.0	**2.3**

as at 30 June 2017				
Orebody category		**UG2**		
		Proved	**Probable**	**Total**
Tonnes	Mt	10.7	22.5	**33.2**
Width	cm	236	252	
4E grade	g/t	2.96	2.77	**2.83**
6E grade	g/t	3.64	3.39	**3.47**
4E oz	Moz	1.0	2.0	**3.0**
6E oz	Moz	1.3	2.5	**3.7**
Pt oz	Moz	0.6	1.1	**1.7**
Pd oz	Moz	0.3	0.7	**1.0**

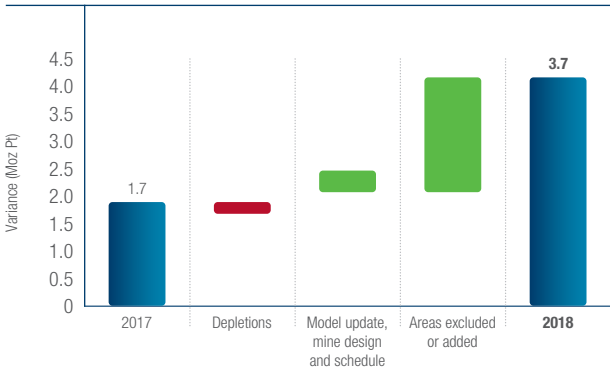
Relationship between exploration results, Mineral Resources and Mineral Reserves (100%)



Two Rivers

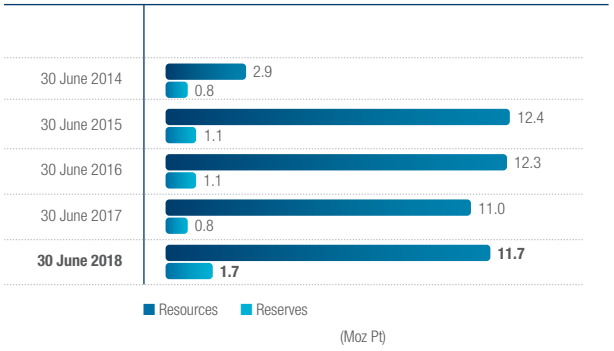
The year-on-year comparisons indicate that there has been a material change since the 30 June 2017 statement: the main changes can be attributed to addition of the RE portion of Kalkfontein which also facilitated access to the adjacent Mineral Reserves. In addition depletion and model updates related to split reef facies impacted on the Mineral Reserve estimate as at 30 June 2018. This year-on-year reconciliation of the total Two Rivers Mineral Reserves is depicted in the accompanying graph. In addition the five-year attributable estimated platinum ounces are shown for both Mineral Resources and Mineral Reserves.

Total Two Rivers Mineral Reserves as at 30 June 2018



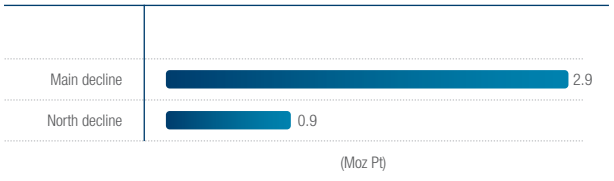
Two Rivers attributable Mineral Resources and Mineral Reserves

as at 30 June 2018

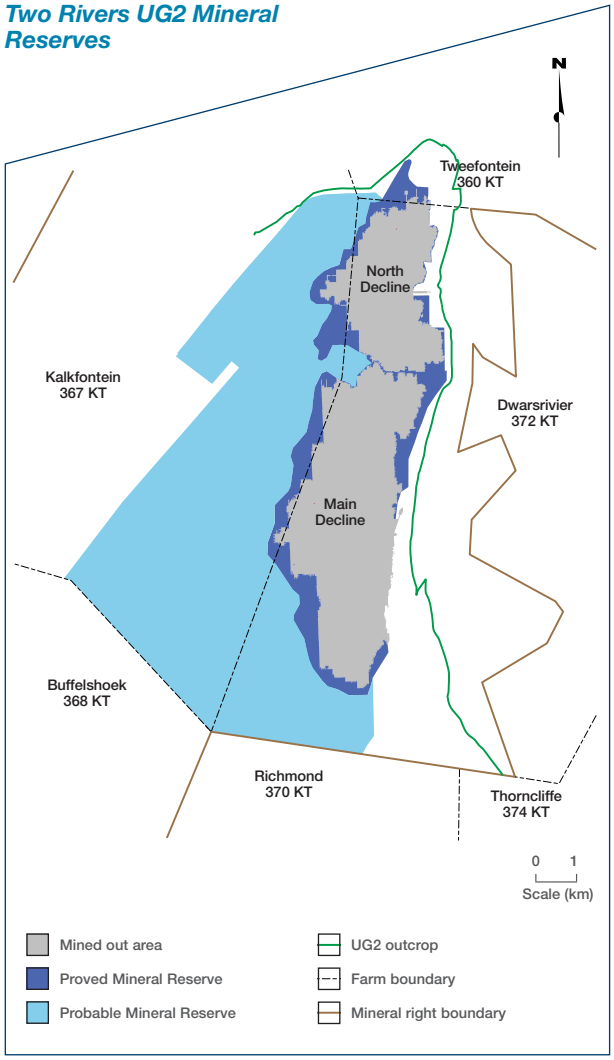


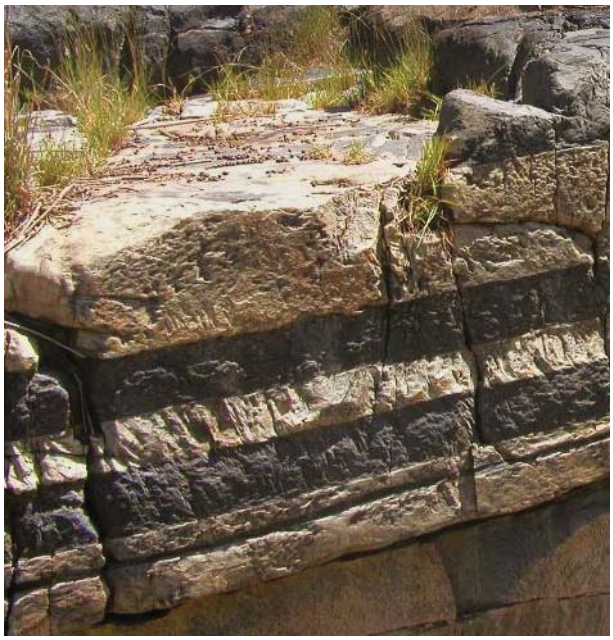
The larger portion of the Two Rivers Mineral Reserves (77%) is located in the Main Decline block.

Two Rivers Mineral Reserve distribution as at 30 June 2018



Two Rivers UG2 Mineral Reserves





UG1 outcrop, Two Rivers

Processing

Two Rivers has a concentrator plant on site where initial processing is done. It comprises a standard MF2 design as generally used in the industry. Concentrate is transported by road to Impala Mineral Processes in Rustenburg where further processing takes place in terms of an agreement with Impala.

Two Rivers top risks

The top risks identified by Two Rivers Mine are:

> Lack of formal approval of Section 31 application
> Lack of mining flexibility
> Business interruption due to community unrest
> Uncertainty regarding regulatory changes
> Failure of electrical infrastructure
> Inability to complete construction of the new tailings facility by May 2021
> Lower plant once output due to a lower mill grades
> Underground fire resulting in multiple fatalities and business interruptions.

Valuation

The economic viability of the Two Rivers Mineral Reserves is tested by Implats by means of net present value calculations over the LoM of the Mineral Reserve, determining the lowest real rand basket price that would still render the Mineral Reserve viable. These calculations generate basket prices based on the local PGM metal ratios and differs from the overall Group basket prices. This is then tested against the internal estimate of the real long-term basket price and the spot price as at 30 June 2018. These tests by Implats indicate that the Two Rivers operation requires a real long-term basket price of between R16 300 and R17 100 to be economically viable. While the real spot basket price for Two Rivers as at 30 June 2018 was R23 110 (US$1 670), the Two Rivers internal long-term real basket price is R24 400 (US$1 880).

Compliance

Two Rivers has adopted the SAMREC Code for its reporting. The Lead Competent Person for Two Rivers Mineral Resources is Shepherd Kadzviti, PrSciNat SACNASP Registration No: 400164/05, a full-time employee of ARM with 28 years of relevant experience. The Lead Competent Person for Two Rivers Mineral Reserves is Michael Cowell, PrSciNat SACNASP Registration No: 400102/02, a full-time employee of Two Rivers with 16 years of relevant experience. Implats has written confirmation from the Competent Persons that the information disclosed in terms of these paragraphs are compliant with the SAMREC Code and, where applicable, the relevant SAMREC Table 1 and JSE Section 12 requirements and that it may be published in the form, format and context in which it was intended.

Key operating statistics

		FY2018	FY2017	FY2016	FY2015	FY2014
Production						
Tonnes milled ex mine	(000t)	**3 445**	3 501	3 511	3 362	3 279
Head grade 6E	(g/t)	**3.63**	3.90	4.06	3.98	4.01
Platinum in concentrate	(000 oz)	**163**	182	186	174	175
PGM in concentrate	(000 oz)	**348**	390	401	373	375
Cost of sales	(Rm)	**(2 785)**	(2 872)	(2 822)	(2 657)	(2 587)
On-mine operations	(Rm)	**(1 940)**	(1 927)	(1 785)	(1 714)	(1 657)
Concentrating operations	(Rm)	**(419)**	(424)	(404)	(359)	(345)
Other	(Rm)	**(426)**	(521)	(633)	(584)	(585)
Total cost	(Rm)	**2 359**	2 351	2 189	2 073	2 002
Per tonne milled	(R/t)	**683**	672	623	617	611
	($/t)	**53**	49	43	54	59
Per Pt oz in concentrate	(R/oz)	**14 517**	12 925	11 775	11 948	11 433
	($/oz)	**1 130**	948	816	1 047	1 103
Financial ratios						
Gross margin ex mine	(%)	**26**	27.3	27.5	27.7	29.5
Capital expenditure	(Rm)	**454**	293	282	275	319
	($m)	**35**	21	20	24	31

Zimplats

ZIMPLATS' OPERATIONS ARE LOCATED IN THE MASHONALAND WEST PROVINCE OF ZIMBABWE.

Location

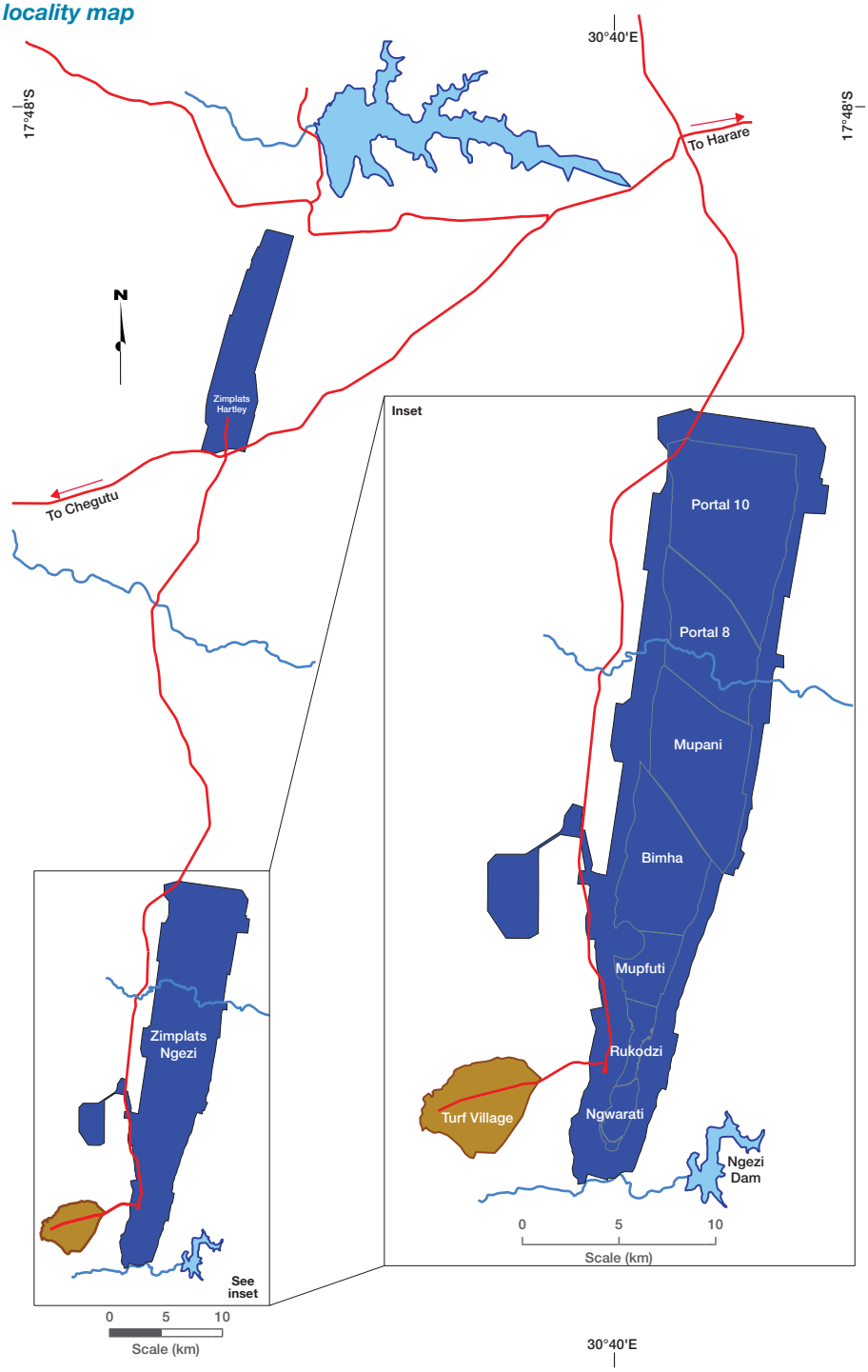
Ngezi Mine is located approximately 150km southwest of Harare, at the southern end of the Sebakwe sub-chamber of the Hartley Complex on the Great Dyke. Hartley Mine and the Selous Metallurgical Complex (SMC) are located 80km west-southwest of Harare and 77km north of the Ngezi Mine in the Darwendale sub-chamber of the Hartley Complex of the Great Dyke.

Zimplats

History

Delta Gold brought BHP into a joint venture (66.7% BHP and 33.3% Delta Gold) to develop Hartley Platinum Mine and development started in 1994. By 1998 Delta Gold had extended its cover to include interests in all the platinum resources of the Hartley Complex. In 1998, Delta Gold demerged its platinum interests into a special purpose vehicle, Zimplats. In 1999 it became apparent that Hartley Platinum Mine had failed to meet its development targets and was put on care and maintenance by BHP. Zimplats subsequently took over BHP's share of Hartley, Selous Metallurgical Complex (SMC) and initiated the Ngezi/SMC project in 2001 with the assistance of Implats and ABSA Bank Investment. A 2.2 million tonne per year open pit mine was established at Ngezi whose ore was trucked to Selous where it was processed in the SMC concentrator and smelting facilities. The first converter matte was exported to South Africa in April 2002 and Implats progressively increased its shareholding in Zimplats until 2003, when it made an unconditional cash offer to minority shareholders in Zimplats. In 2003, Zimplats embarked on the development of underground operations at Ngezi to

Zimplats regional locality map



Zimplats

replace the east and west open pits, which were eventually stopped in 2008. Over the past eight years the production volumes from the operations have been increased to the current 6.2 million tonnes of ore per year from four underground portals and one open pit, all of which feed the two concentrator modules at Ngezi, as well as the SMC concentrator. The open pit mine was closed during the past year and the construction of a new portal is under way. Currently Implats' shareholding in the entity is 87% with the remaining 13% being held by minority shareholders.

Mineral rights

In March 2013, the GoZ gazetted a preliminary notice of its intention to compulsorily acquire a large portion of land held under the Zimplats special mining lease and situated to the north of Portal 10. In March 2013 Zimplats lodged a formal objection to the preliminary notice to compulsorily acquire the land. From January 2015 Zimplats was actively engaged in discussions with the GoZ in an endeavour to resolve the matter amicably. On 29 June 2016 Zimplats was served with an application filed in the Administrative Court of Zimbabwe in which the GoZ sought an order authorising the acquisition by the GoZ of the land described in the preliminary notice referred to above. On 18 November 2016, the GoZ reissued the gazette using the same coordinates as previously gazetted in March 2013. On 13 January 2017 the GoZ again issued, through a Government Gazette Extraordinary, a preliminary notice in terms of which it gave fresh notice that it intended to compulsorily acquire land measuring 27 948 hectares within Zimplats' mining lease area. This notice repealed all previous notices issued by the GoZ in respect to its proposed compulsory acquisition of this portion of Zimplats' mining lease area. Papers opposing the application were filed on behalf of Zimplats Holdings Limited and Zimplats.

Zimplats announced on 6 June 2018 that the issue concerning the proposed compulsory acquisition of a portion of Zimplats' mining lease area, as well as the issue of security of Zimplats' mining tenure, had been resolved amicably between Zimplats, through the operating subsidiary, and the government to the mutual benefit of the parties. Zimplats agreed to release to the government land measuring 23 903 hectares within Zimplats' mining lease area in support of the government's efforts to enable participation by other investors in the platinum mining industry in Zimbabwe.

Following this release of land, Zimplats now holds two separate and non-contiguous pieces of land measuring in aggregate 24 632 hectares. Consequently, the operating subsidiary applied for and was granted with effect from 31 May 2018, two separate mining leases over the two pieces of land measuring 6 605 hectares and 18 027 hectares respectively. These mining leases replace the special mining lease which was due for renewal in August 2019.

The two mining leases issued to the operating subsidiary are valid for the life-of-mine of Zimplats' mining operations and they secure the operating subsidiary's mining tenure.

This arrangement whereby Zimplats released a large portion of land north of Portal 10 had a material impact on the Mineral Resource estimate, the details of which are described in the Mineral Resources estimation section.

	Mining right (ha)	Implats' interest (%)
Zimplats	24 632	87

Infrastructure

Infrastructure to support production consists of integrated road networks, four production decline portals, conveyor networks and ore load out facilities for road trains. Ore processing infrastructure consists of two concentrator modules at Ngezi with a combined capacity of 4Mtpa, one concentrator and a smelter at SMC. Water for the Ngezi operations is drawn from the Ngezi and Chitsuwa Dams. Zimplats' annual allocation from the two dams is 11 000Ml and this exceeds the current requirements. The SMC is located some 77km north of Ngezi Mine with processing infrastructure which includes a 2.2Mtpa concentrator, a 13.5MVA smelter, tailings storage facilities, stores and offices. Water for the SMC operations is abstracted from the Manyane Dam where Zimplats has an annual allocation of 5 000Ml. Power from ZESA's Selous sub-station is fed to the transformers at Ngezi and SMC via the 132kV overhead lines. These assets and the wide network of information technology and communication equipment provide services to the business.

Environmental

Summary details pertaining to the Group environmental management and policy are listed on page 26. This includes the focus areas such as compliance, water stewardship, air quality, managing waste streams and promoting land management practices.

Zimplats is ISO 14001 certified. In line with the environmental management system expectations, all areas are required to identify and report on environmental incidents. Systems are in place to investigate and determine the root causes of high severity incidents, to address and close out these incidents. One tailings storage facility is located at SMC within the special mining lease area. The tailings storage facility is designed for a deposition rate of 2.4 million tonnes per year and a LoM storage capacity of 72 million tonnes. Additional space is available to extend the tailings facility in future.

The tailings storage facility at Ngezi is designed for a ramp up in deposition from 2 million tonnes to 12 million tonnes per year. The current deposition rate is 4.2Mtpa. The tailings dam is designed for a LoM deposition of 450 million tonnes. Tree planting and grassing at Ngezi and the SMC tailings dams are carried out regularly to create a physical barrier and to address the issue of dust from the tailings dam, while efforts are also made to keep the dam moist to suppress dust. The current tailings dam rehabilitation targets new surfaces created as the tailings dam continues to rise.

Zimplats has successfully completed work to attain 100% compliance with the waste and effluent regulations requirements through the construction of leachate collection systems and landfill lining for both the Ngezi and SMC landfills.

Zimplats

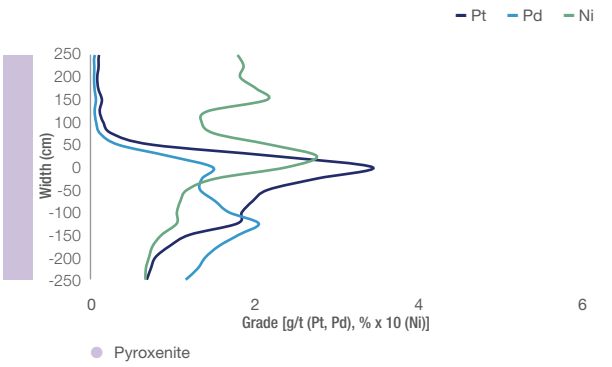
Geology

The Great Dyke of Zimbabwe developed as a series of initially discrete magma chamber compartments, which coalesced as the chambers filled. On the basis of structure, style of layering and continuity of layers, the Great Dyke has been sub-divided into five sub-chambers, namely the Wedza, Selukwe (Shurugwi), Sebakwe, Darwendale and Musengezi sub-chambers. The stratigraphic units in each sub-chamber are classified into the ultramafic (lower) and the mafic (upper) sequence. The ultramafic rocks are dominated from the base upwards by dunite, harzburgite and pyroxenite, while the mafic rocks consist mainly of gabbro and gabbronorite. Narrow layers of chromitite occur at the base of cyclic units throughout the ultramafic sequence. The platinum-bearing horizon is known as the Main Sulphide Zone (MSZ), which is part of the lower sequence and is located below the contact with the mafic sequence.

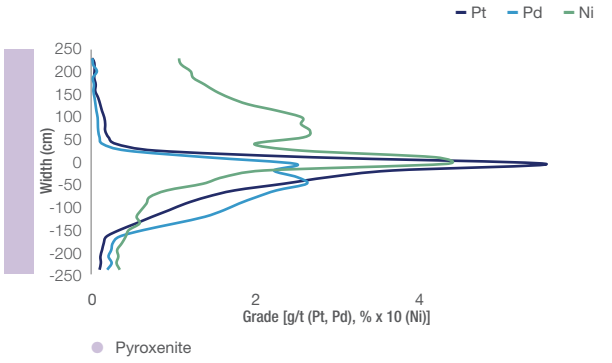
The platinum-bearing MSZ is located in the P1 pyroxenite some 5m to 50m below the ultramafic/mafic contact. The MSZ is a continuous layer, 2m to 10m thick, and forms an elongated basin. The zone strikes in a north-northeasterly trend and dips between 5° and 20° on the margins, flattening towards the axis (centre) of the basin. The areas where the dip is less than 9° is referred to as the 'Flats'; these have historically been the target for mining due to the ease of operating. The areas with dips between 9° and 14° are referred to as the 'Upper Ores I'. Peak base metal and PGM values are offset vertically with palladium peaking at the base, platinum in the centre and nickel towards the top. Visual identification of the MSZ is difficult, therefore systematic monitoring of the reef using various sampling methods is needed to guide mining. The accompanying schematic diagram illustrates the form of the Great Dyke.

The geological sequence is illustrated in the accompanying generalised stratigraphic column on the following page.

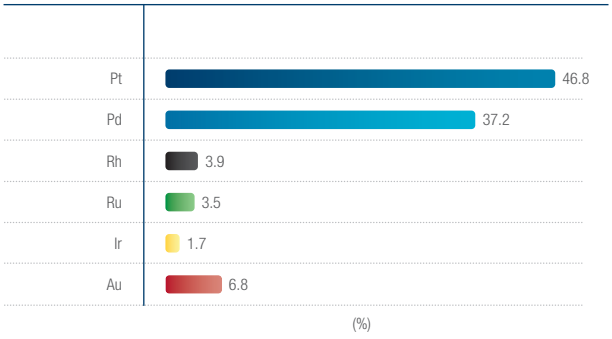
Ngezi – MSZ



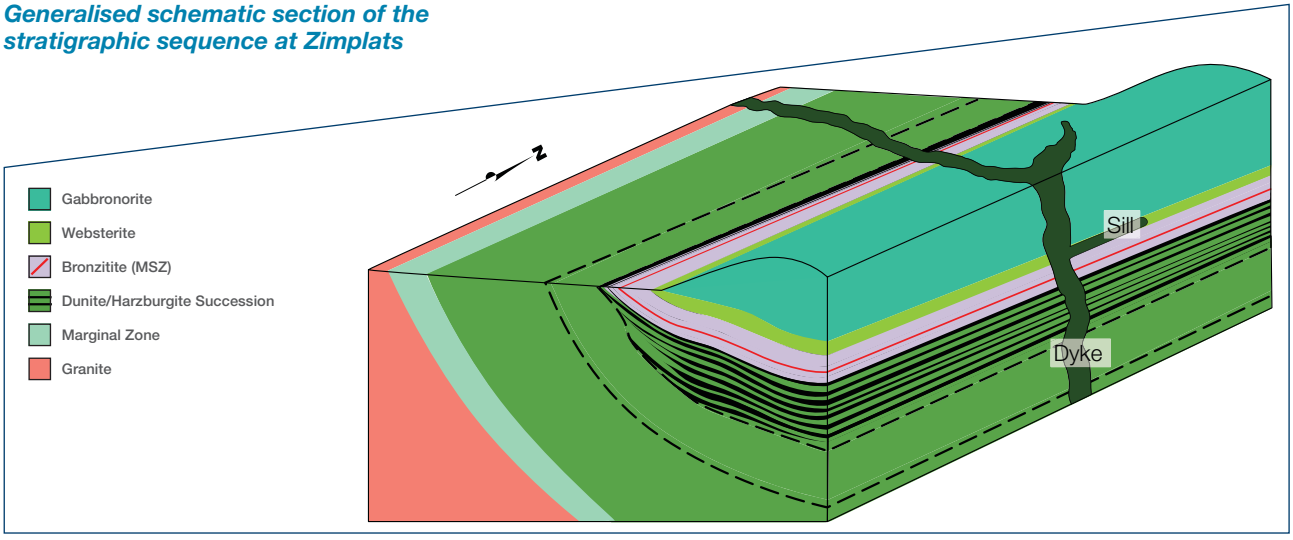
Hartley – MSZ



Zimplats MSZ 6E metal ratio as at 30 June 2018

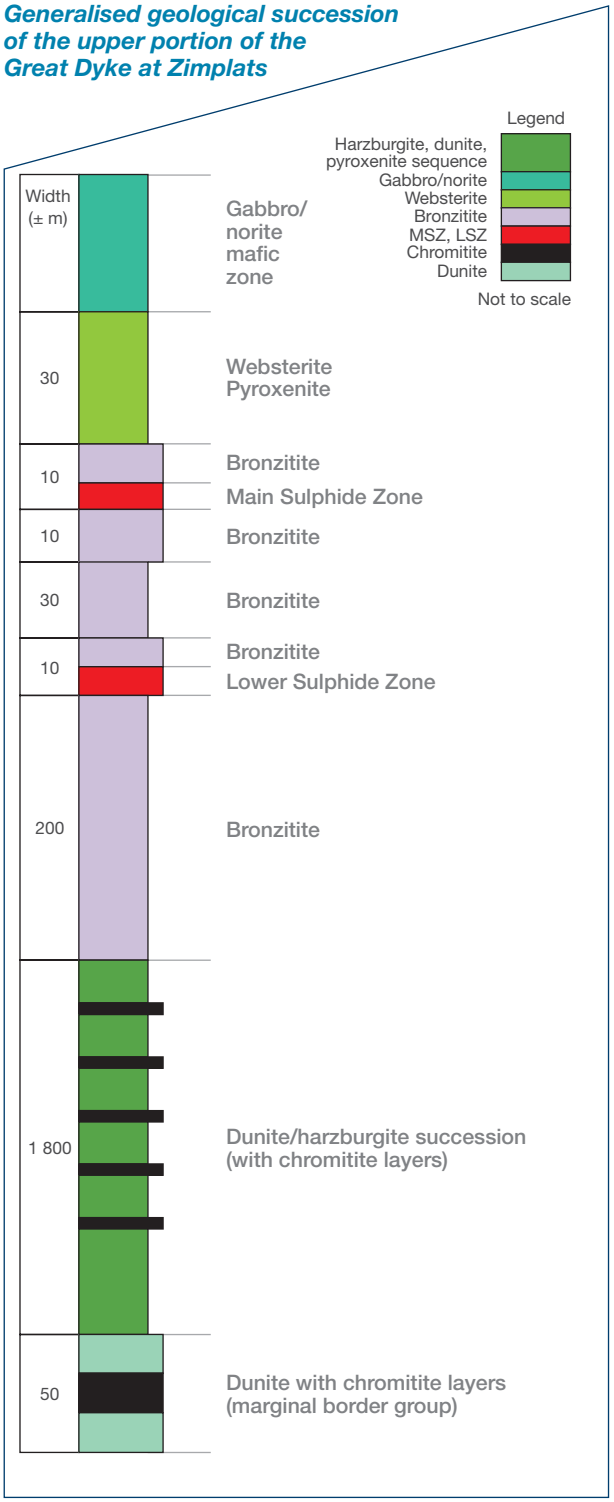


Generalised schematic section of the stratigraphic sequence at Zimplats



Zimplats

Generalised geological succession of the upper portion of the Great Dyke at Zimplats



Exploration

During the past year surface exploration drilling at Zimplats was targeted at increasing the density of geological and geotechnical knowledge of the Mineral Resource with focus on the Upper Ores I which dip between 9° and 14° at Bimha and at Portal 8 where large-scale displacements were investigated.

Surface exploration drilling for Mineral Resources evaluation and geotechnical assessment continued during the past year. The bulk of the focus was to support studies at Portals 8 and 10 as well as the feasibility of mining the Upper Ores. The following surface drilling was completed:

> Mupfuti Mine – 15 boreholes
> Bimha Mine – 20 boreholes
> Mupani Mine – 7 boreholes
> Portal 8 – 26 boreholes
> Portal 10 – 7 boreholes

Underground core-recovering drilling was done for reef profiling and geotechnical assessment as follows:

> Ngwarati Mine – 13 boreholes
> Rukodzi Mine – 13 boreholes
> Mupfuti Mine – 28 boreholes
> Bimha Mine – 28 boreholes
> Mupani Mine – 5 boreholes

All holes were logged and sampled and no new major geological structures were identified.

Mineral Resource estimation and reconciliation

The updated Mineral Resource estimates as at 30 June 2018 are tabulated on page 81. Corresponding estimated Mineral Resources attributable to Implats are summarised on page 27. Note that the Mineral Resources are quoted inclusive of Mineral Reserves. Day-to-day operations are monitored using in-house lead collection fire assays with AA finish. The Mineral Resources and Mineral Reserves in this statement are based largely on external nickel sulphide collection fire assays with ICP-MS finish. The differences between the methods are incorporated within the modifying factors that have been applied, which means that there may be slight distortions in recovery and other parameters.

Zimplats

Oxides have lower metallurgical recovery than sulphides with conventional extraction technology and are currently marginal to sub-economic. Oxides are rarely sampled directly, therefore some elements, particularly palladium, may be depleted relative to the figures quoted.

Mineral Resources have been estimated using kriging techniques on assay data derived from surface boreholes. Estimates are based on composite widths that vary depending on cut-off grades, which are based on appropriate economic parameters. The recently completed numerical modelling exercise has confirmed that the revised pillar layout is robust and will arrest any propagation of pillar failure in the mine.

The classification of Mineral Resources at Zimplats is informed by a matrix considering geological complexity and the confidence in the geostatistical estimation. In broad terms confidence is derived from surface borehole spacing and this has the largest weighting on classification of Mineral Resources:

- Borehole spacing of 250m or less supports Measured Mineral Resources
- Borehole spacing between 250m and 500m supports Indicated Mineral Resources
- Borehole spacing greater than 500m supports Inferred Mineral Resources.

Rounding-off of figures in this report may result in minor computational discrepancies. Where this occurs it is not deemed significant. Mineral Resources estimates are inherently imprecise and require the application of judgement and are subject to future revisions. The results tabulated in this report must be read as estimates and not as calculations. Inferred Mineral Resources in particular are qualified as approximations. More details regarding the Mineral Resources and Mineral Reserves can be obtained from the 2018 Zimplats annual report.

Zimplats Mineral Resources (inclusive reporting)

as at 30 June 2018

Orebody		Ngezi Portals				Mining lease north of Portal 10			Hartley				Oxides – all areas			
category		Measured	Indicated	Inferred	Total	Indicated	Inferred	Total	Measured	Indicated	Inferred	Total	Indicated	Inferred	Total	Total
Tonnes	Mt	152.8	454.3	121.7	728.7				28.3	143.1	46.3	217.7	16.0	39.3	55.4	**1 001.7**
Width	cm	252	238	200					158	189	191		250	216		
4E grade	g/t	3.34	3.42	3.28	3.38				4.53	3.97	3.89	4.03	3.42	3.55	3.51	**3.53**
6E grade	g/t	3.52	3.60	3.45	3.56				4.78	4.19	4.10	4.25	3.61	3.75	3.71	**3.72**
Ni	%	0.11	0.12	0.12	0.12				0.14	0.13	0.13	0.13	0.10	0.12	0.11	**0.12**
Cu	%	0.07	0.09	0.09	0.08				0.12	0.11	0.10	0.11	0.07	0.10	0.09	**0.09**
4E oz	Moz	16.4	50.0	12.8	79.2				4.1	18.3	5.8	28.2	1.8	4.5	6.3	**113.7**
6E oz	Moz	17.3	52.6	13.5	83.4				4.3	19.3	6.1	29.7	1.9	4.7	6.6	**119.8**
Pt oz	Moz	8.2	25.1	6.6	39.9				2.0	9.3	3.0	14.2	0.9	2.2	3.1	**57.3**
Pd oz	Moz	6.4	19.0	4.7	30.0				1.6	6.8	2.1	10.6	0.7	1.7	2.4	**43.0**

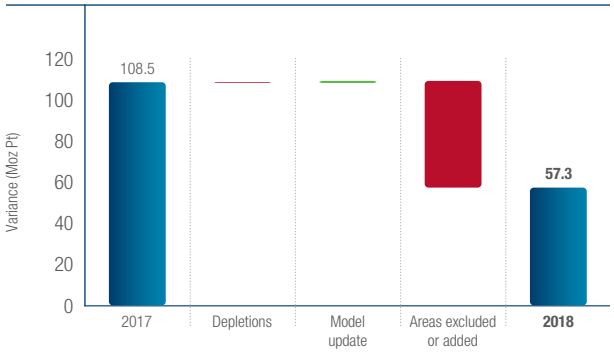
as at 30 June 2017

Orebody		Ngezi Portals				Mining lease north of Portal 10			Hartley				Oxides – all areas			
category		Measured	Indicated	Inferred	Total	Indicated	Inferred	Total	Measured	Indicated	Inferred	Total	Indicated	Inferred	Total	Total
Tonnes	Mt	140.2	436.5	99.7	676.4	70.0	1 021.0	1 091.0	28.3	143.1	46.3	217.7	16.0	59.3	75.4	**2 060.4**
Width	cm	250	234	214		192	239		158	189	191		250	225		
4E grade	g/t	3.33	3.37	3.22	3.34	3.44	3.22	3.23	4.53	3.97	3.89	4.03	3.42	3.42	3.42	**3.36**
6E grade	g/t	3.52	3.55	3.39	3.52	3.70	3.50	3.51	4.78	4.19	4.10	4.25	3.61	3.64	3.64	**3.60**
Ni	%	0.10	0.11	0.12	0.11	0.20	0.12	0.13	0.14	0.13	0.13	0.13	0.10	0.12	0.11	**0.12**
Cu	%	0.08	0.08	0.08	0.08	0.18	0.09	0.10	0.12	0.11	0.10	0.11	0.07	0.10	0.09	**0.09**
4E oz	Moz	15.0	47.3	10.3	72.6	7.7	105.7	113.4	4.1	18.3	5.8	28.2	1.8	6.5	8.3	**222.6**
6E oz	Moz	15.8	49.8	10.9	76.5	8.3	114.9	123.2	4.3	19.3	6.1	29.7	1.9	7.0	8.8	**238.3**
Pt oz	Moz	7.4	23.6	5.5	36.5	3.4	50.2	53.6	2.0	9.3	3.0	14.2	0.9	3.2	4.1	**108.5**
Pd oz	Moz	5.9	18.2	3.6	27.6	3.2	42.7	45.8	1.6	6.8	2.1	10.6	0.7	2.6	3.2	**87.3**

Zimplats

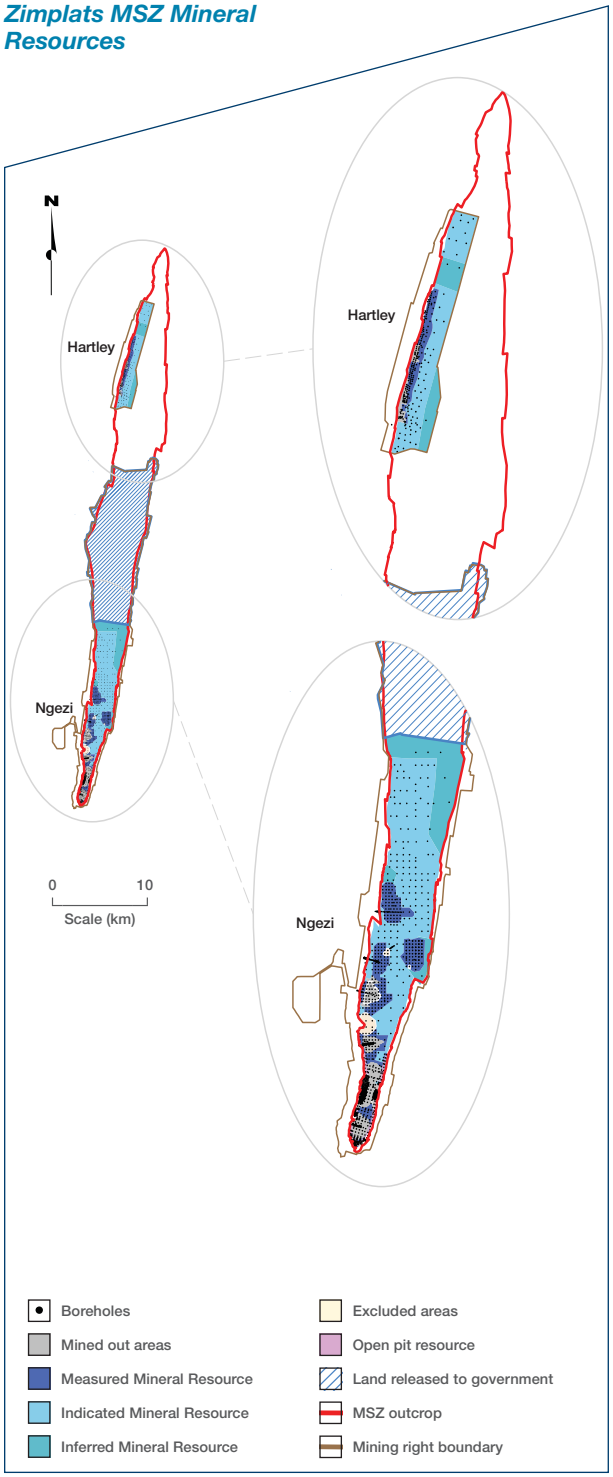
The year-on-year reconciliation of the Mineral Resources for Zimplats show a material reduction, this relates mostly to the release of land north of Portal 10 to the GoZ. The impact of this process is estimated at some 51.9Moz Pt that was removed from the Zimplats Mineral Resource inventory. The estimated total platinum Mineral Resource decreased from 108.5Moz Pt to 57.3Moz Pt; this translates to a decrease of some 47% and includes the impact of normal mining depletion and model updates. The release of land does not have any impact on the 30-year LoM plan for Zimplats.

Total Zimplats Mineral Resources as at 30 June 2018



Measuring stress variations in underground pillars at Zimplats

Zimplats MSZ Mineral Resources



Zimplats

Modifying factors

The modifying factors used to convert Mineral Resources to Mineral Reserves are derived from historical performance while taking future anticipated conditions into account. Implats' long-term price assumptions in today's money (supporting Mineral Reserve estimates) are shown on pages 5 and 25. The following other modifying factors were applied to the Mineral Resources:

Key factors and assumptions

Main Sulphide Zone	Factors
Geological losses	5 – 26%
Mineral Resource area	203 million ca
Pillar factors	20 – 34%
Resource dilution	6 – 10%
Mine call factor	91%
Relative density	3.18 – 3.25
Resource width	236cm
Stoping width	275cm
Concentrator recoveries	80 – 81%

Zimplats portal names	
Portal 1	Ngwarati
Portal 2	Rukodzi
Portal 3	Mupfuti
Portal 4	Bimha
Portal 6	Mupani

Mining methods and mine planning

The current mine infrastructure consists of five portals (decline shafts), the one remaining open pit was terminated during the past year. The deepest operating depth is some 310m at Bimha Mine (Portal 4). Boundaries between individual portals are based on a maximum strike length of 3km to 6km or are terminated on known geological discontinuities such as major faults.

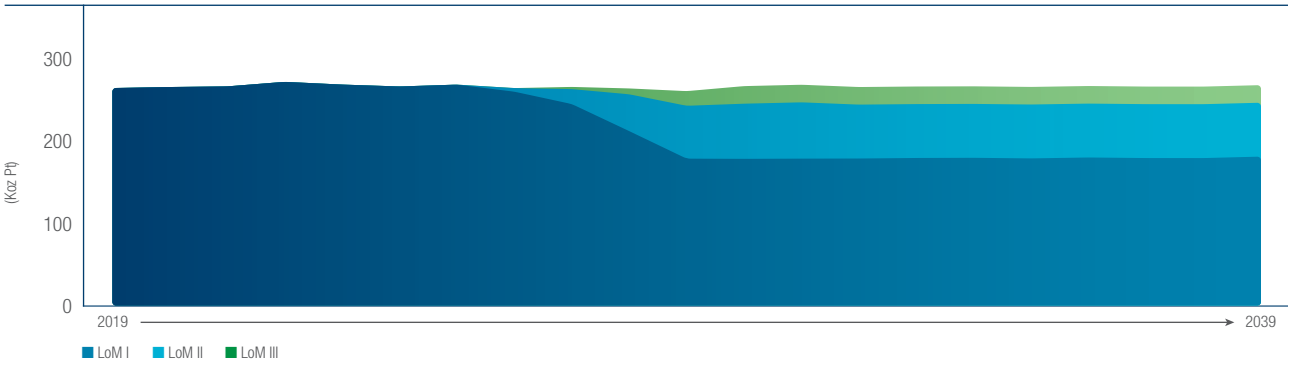
Minor faults and other geological discontinuities are present at the operations and are accounted for as geological losses during the Mineral Resources and Mineral Reserves estimation process. At all the underground portals, Zimplats employs a mechanised room and pillar mining method on a narrow reef to extract ore from stopes whose nominal width is 2.5m. During the past year trial mining to confirm a mechanised method to efficiently extract the Upper Ores I, which are areas dipping between 9° and 14°, was successfully concluded. To this effect some of the Upper Ore areas have been converted to Mineral Reserves and resulted in a material increase in the Mineral Reserve estimate at Zimplats.

The trackless mechanised machinery consist of low profile single boom face rigs for drilling, low profile roof bolters for support drilling, 10t load and dump (LHDs) and 30t dump trucks. A self-directed work team (SDWT) is allocated about 20 rooms and its total face length is dependent on the sizes (widths) of the pillars and rooms. This enables the SDWT to adhere to a mining cycle consisting of face drilling and blasting, support installation and loading and hauling with adequate redundancy to achieve set production targets. At Rukodzi and Ngwarati Mines, the broken rock is loaded onto trucks by LHD and trucked to a surface crusher. Mupfuti Mine has an underground crushing plant and ore is tipped into the crusher and conveyed to surface. The production target for each fleet varies from 17 500t to more than 20 000t of ore per month, depending on the particular mine, ground conditions and the existing pillar layout. The typical layout comprises 7m panels with different sizes of in-stope pillars, which are determined by the depth below surface and geotechnical considerations. At Mupfuti and Bimha mines, barrier pillars are set out on a 200m x 200m 'paddock'. This pillar layout is meant to contain any likelihood of cascading pillar failure should in-stope pillars fail. Ngwarati and Rukodzi Mines do not have barrier pillars nor paddocks owing to their shallow depth below surface. At all the portals, the spans of rooms may decrease and pillar dimensions may increase in bad ground. A combination of roof bolts and tendons is integral to the support design.

Bimha Mine redevelopment is on target and the ramp-up to full production was achieved during the past year. A total combined production of 6.2Mtpa will be sustained beyond the next 30 years as the next new portal (Mupani Mine) is on course to replace the mature Rukodzi and Ngwarati mines which will be depleted in FY2021 and FY2025 respectively. The production from the new mine will feed ore to the SMC concentrator and the high level LoM profile is depicted in the accompanying graph. Evaluation work on the next mine to be developed has commenced to better understand the geological structures.

Zimplats

Zimplats 20-year LoM Pt ounce profile as at 30 June 2018 (in matte)



Mineral Reserve estimation and reconciliation

The Zimplats Mineral Reserve Statement as at 30 June 2018 is shown alongside. Corresponding estimated Mineral Reserves attributable to Implats are summarised on page 29. The Mineral Reserves quoted reflect anticipated grades delivered to the mill.

The conversion and classification of Mineral Reserves at Zimplats is informed by:

> Feasible mine plan and project studies, Board approval and available funding
> Economic testing at given market conditions (price deck)
> Indicated Mineral Resources can be classified as Probable Mineral Reserves if the mine plan, approval, funding and economic test is passed
> Measured Mineral Resources can be classified as Proved Mineral Reserves if the mine plan approval, funding and economic test is passed
> In certain exceptional circumstances the Competent Person may elect to convert Measured Mineral Resources to Probable Mineral Reserves if the confidence in the modifying factors is being confirmed
> No Inferred Mineral Resources are converted to the Mineral Reserve category.

More details regarding the Mineral Resources and Mineral Reserves can be obtained from the 2018 Zimplats annual report on **www.zimplats.com**.

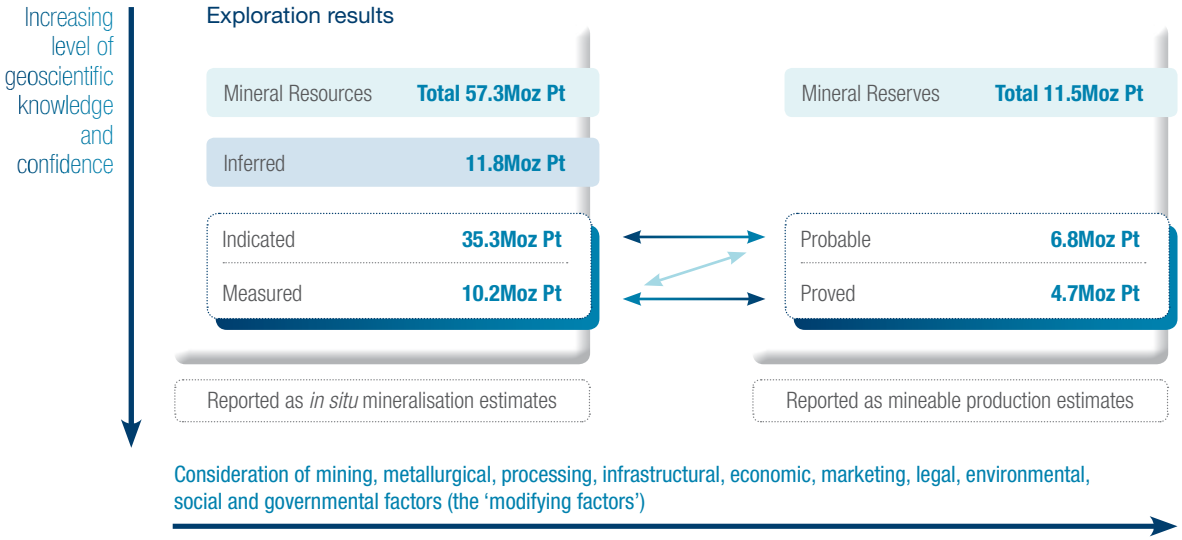
Zimplats Mineral Reserves

as at 30 June 2018				
Orebody category		**Proved**	**Probable**	**Total**
Tonnes	Mt	93.4	132.9	**226.3**
Width	cm	265	265	
4E grade	g/t	3.17	3.21	**3.19**
6E grade	g/t	3.34	3.38	**3.37**
Ni	%	0.10	0.10	**0.10**
Cu	%	0.07	0.07	**0.07**
4E oz	Moz	9.5	13.7	**23.2**
6E oz	Moz	10.0	14.4	**24.5**
Pt oz	Moz	4.7	6.8	**11.5**
Pd oz	Moz	3.8	5.3	**9.1**

as at 30 June 2017				
Orebody category		**Proved**	**Probable**	**Total**
Tonnes	Mt	63.6	101.5	**165.1**
Width	cm	266	265	
4E grade	g/t	3.25	3.26	**3.25**
6E grade	g/t	3.43	3.44	**3.43**
Ni	%	0.10	0.09	**0.10**
Cu	%	0.07	0.08	**0.08**
4E oz	Moz	6.6	10.6	**17.3**
6E oz	Moz	7.0	11.2	**18.2**
Pt oz	Moz	3.3	5.3	**8.6**
Pd oz	Moz	2.6	4.1	**6.7**

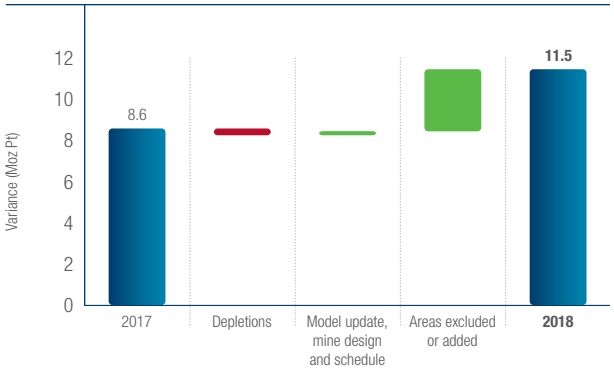
Zimplats

Relationship between exploration results, Mineral Resources and Mineral Reserves (100%)



The year-on-year reconciliation of the Mineral Reserves at Zimplats shows a large increase due to the conversion of some Upper Ores to the Mineral Reserve category. This is the result of extensive trial studies and resulted in a 33% increase in the estimated Mineral Reserves at Zimplats which increased from 8.6Moz Pt to 11.5Moz Pt.

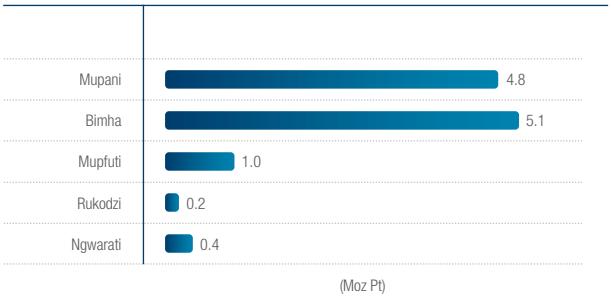
Total Zimplats Mineral Reserves as at 30 June 2018



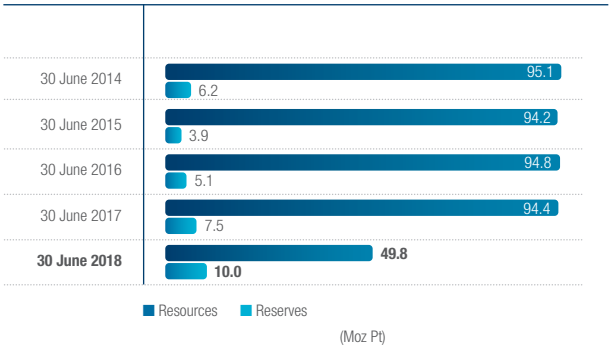
More details related to this change can be found on the Zimplats website **www.zimplats.com**.

The distribution of Mineral Reserves at the different portals is shown alongside, indicating the varying sizes and remaining production potential.

Zimplats Mineral Reserve distribution as at 30 June 2018



Zimplats attributable Mineral Resources and Mineral Reserves as at 30 June 2018



Zimplats

Processing

Ore from the mines is processed by two concentrators (one at SMC and the other at Ngezi). The concentrator at Ngezi has two similar modules, which were commissioned in 2009 and 2013 respectively. Each module has a capacity of 2Mtpa, which makes up a total of 4Mtpa. The SMC concentrator has a capacity of 2.2Mtpa. Approximately one-third of the mined ore (2.2Mt) is transported by road trains to the concentrator at SMC, which operates a single semi-autogenous grinding mill (SAG), while the rest is transported by overland conveyor system to the crusher and ball mill concentrator modules at Ngezi.

Concentrate from both Ngezi plants and SMC is then smelted in an arc furnace and converted to matte at SMC. The resulting matte is despatched to Impala's refinery in Springs under the terms of a LoM agreement with Impala.

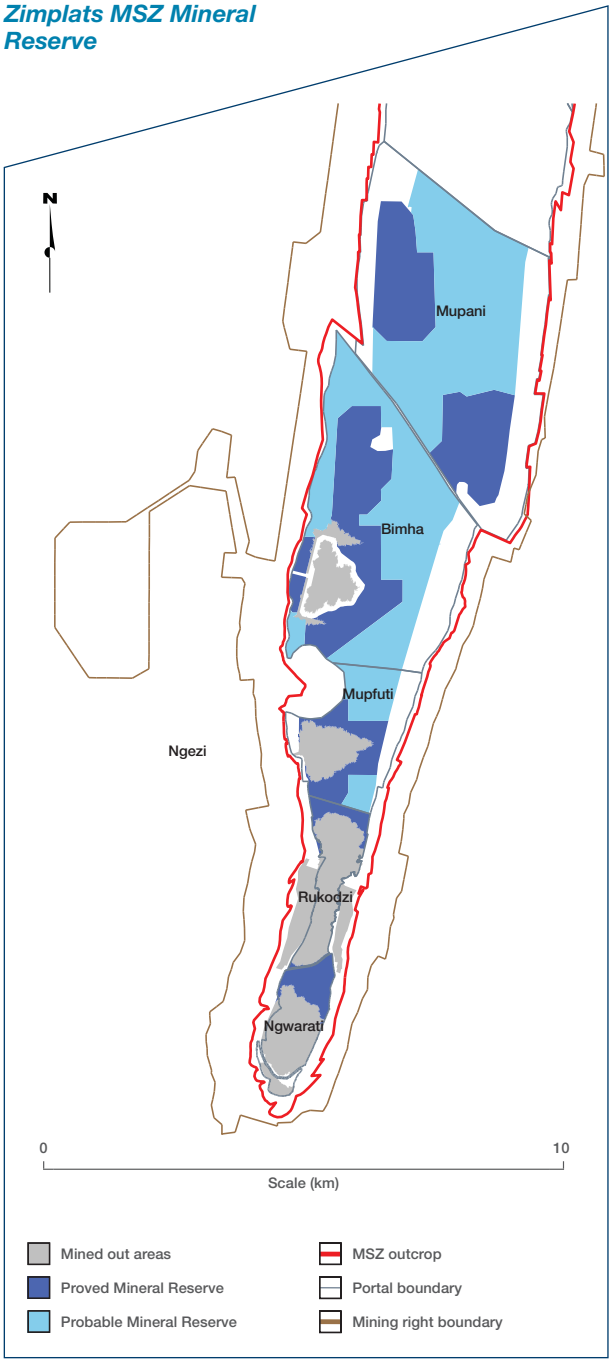
Zimplats top risks

The Group risk management process is briefly described on page 12 where the top 10 Group risks are listed.

In this context the top risks identified at Zimplats are:
> Depressed metal prices
> Inadequate foreign currency
> Cost escalation
> Failure to preserve cash
> Smelter risks
> Taxation
> Indigenisation compliance
> Cyber risk
> Unavailability of reliable, secure and affordable power
> Tailings dam failure.

Control measures to mitigate against these risks are in place.

Zimplats MSZ Mineral Reserve



Zimplats

Valuation

The economic viability of the Zimplats Mineral Reserves is tested by Implats by means of net present value calculations over the LoM of the Mineral Reserve, determining the lowest real rand basket price that would still render the Mineral Reserve viable. These calculations generate basket prices based on the local PGM metal ratios and differs from the overall Group basket prices. This is then tested against the internal Zimplats estimate of the real long-term basket price and the spot price as at 30 June 2018. These tests indicate that the Zimplats operation requires a real long-term basket price of between R20 300 and R21 100 to be economically viable. While the real spot basket price for Zimplats as at 30 June 2018 was R28 780 (US$2 090), the Zimplats internal long-term real basket price is R30 320 (US$2 330).

Compliance

Zimplats Mineral Resources and Mineral Reserves are estimated and reported in accordance with the Implats code of practice for the estimation, classification and reporting of Mineral Resources and Mineral Reserves. The code of practice is an Implats Group-wide protocol that seeks to provide more prescriptive guidance than the Australasian Code for Reporting Exploration Results, Mineral Resources and Mineral Reserves, the Joint Ore Reserve Committee Code (JORC Code), 2012 edition and the SAMREC Code. Zimplats Mineral Resources and Mineral Reserves also meet the requirements of the Code for the Technical Assessment and Valuation of Mineral and Petroleum Assets and Securities for Independent Experts reports, the VALMIN Code, 2005 edition.

The Lead Competent Persons designated in terms of the JORC Code, who took responsibility for the reporting of Mineral Resources and Mineral Reserves as at 30 June 2018, are Steven Duma (PrSciNat SACNASP), AusIMM and Caston Mutevhe (PrEng) ECSA, SAIMM who are full-time employees of Zimplats. Steve is responsible for Mineral Resources and has 21 years of experience in mining and exploration of which nine years have been in platinum in Zimbabwe and South Africa. Caston is responsible for Mineral Reserves and has 24 years of experience in mining of which nine years have been in the platinum mining industry in Zimbabwe. Implats has written confirmation from the Lead Competent Persons that the information disclosed in terms of these paragraphs are compliant with the JORC Code and SAMREC Code and, where applicable, the relevant JORC Table 1 and JSE Section 12 requirements and that it may be published in the form, format and context in which it was intended.

Key operating statistics

		FY2018	FY2017	FY2016	FY2015	FY2014
Production						
Tonnes milled ex mine	(000t)	**6 570**	6 716	6 406	5 164	5 939
Head grade 6E	(g/t)	**3.48**	3.49	3.48	3.47	3.47
Platinum in matte	(000 oz)	**271**	281	290	190	240
PGM in matte	(000 oz)	**578**	602	617	406	516
Cost of sales	(Rm)	**(5 440)**	(5 753)	(6 198)	(4 181)	(3 934)
On-mine operations	(Rm)	**(2 613)**	(2 828)	(2 904)	(2 071)	(1 850)
Processing operations	(Rm)	**(1 562)**	(1 514)	(1 572)	(1 232)	(1 139)
Other	(Rm)	**(1 265)**	(1 411)	(1 722)	(878)	(945)
Total cost	(Rm)	**4 568**	4 787	4 721	3 650	3 208
Per tonne milled	(R/t)	**695**	713	737	707	540
	($/oz)	**54**	52	51	62	52
Per Pt oz in matte	(R/oz)	**16 869**	17 030	16 291	19 211	13 383
	($/oz)	**1 313**	1 249	1 130	1 683	1 291
Financial ratios						
Gross margin ex mine	(%)	**27.3**	18.3	8.2	10.3	34.1
Capital expenditure	(Rm)	**1 738**	863	981	968	1 166
	($m)	**135**	63	68	85	112

Mimosa

MIMOSA MINING COMPANY IS SITUATED 32KM WEST FROM ZVISHAVANE TOWN, ABOUT 340KM SOUTHWEST FROM THE CAPITAL CITY OF HARARE.

Location

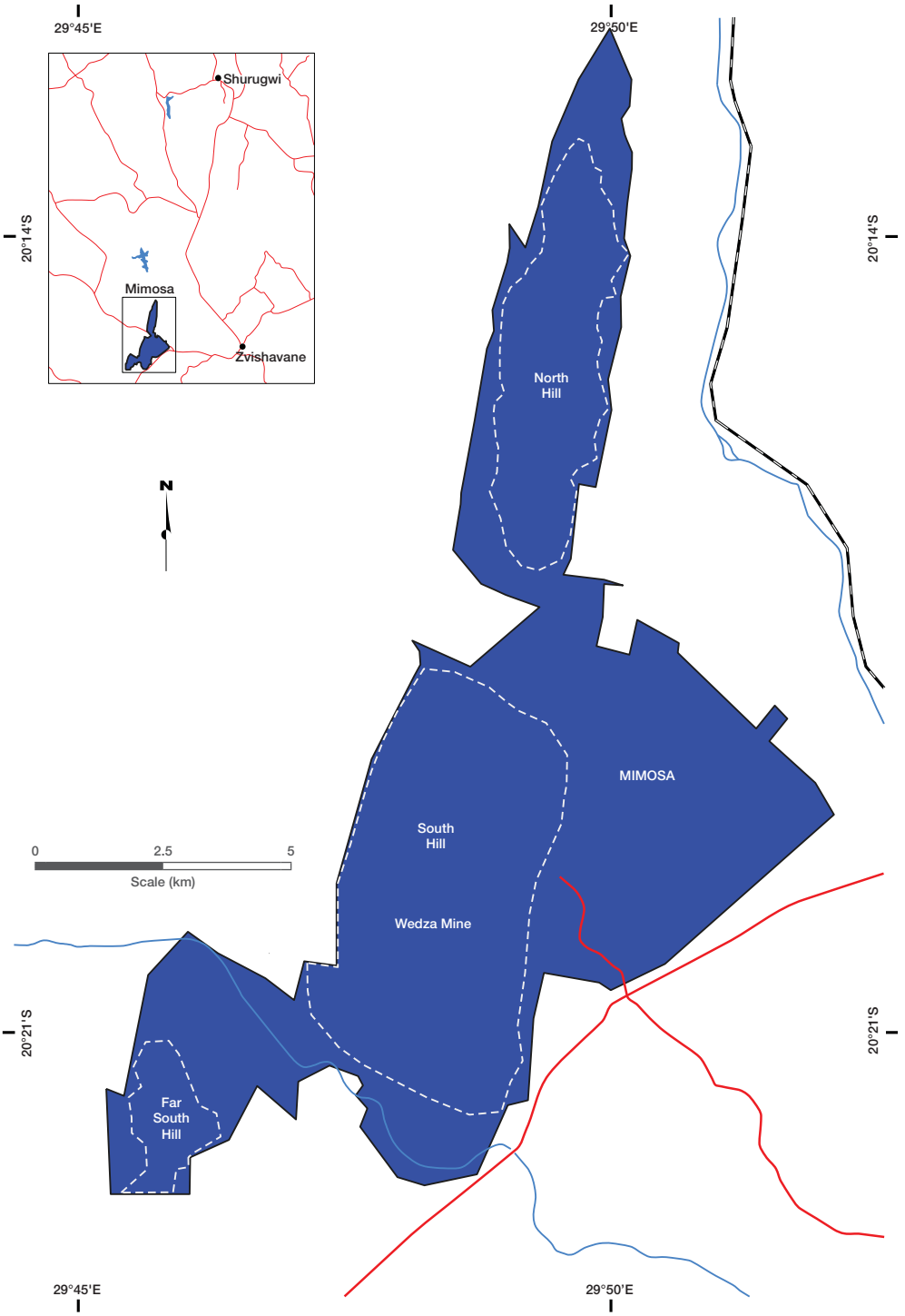
Mimosa is located on the Wedza geological complex of the Great Dyke, about 150km east of Bulawayo in the southern part of the Midlands province, Zimbabwe. The Mimosa Mine is located some 80km south-southwest of the Unki Platinum Mine which is operated by Anglo Platinum.

Mimosa

History

Mining operations targeting mineral extraction from oxide ores started in 1926 at North Hill and lasted approximately two years and approximately 60oz of platinum was recovered. Union Carbide Zimbabwe secured an EPO in the Wedza area over the Mimosa deposit in 1962. Exploration and trial mining were periodically undertaken over a 30-year period. Mimosa was acquired by Zimasco from Union Carbide in 1993. Zimasco piloted platinum mining in Zimbabwe by resuscitating the operation and steadily increasing production to 1 000 tonnes per day, which was achieved in 1998. In July 2001, Implats acquired a 35% stake in Mimosa and increased this stake to 50% with a further acquisition of 15% in August the following year. Aquarius acquired a 50% stake in Mimosa during the same year. Sibanye-Stillwater concluded a deal on 12 April 2016

Mimosa regional locality map



Mimosa

which resulted in Sibanye-Stillwater acquiring all the shares that formerly belonged to Aquarius. Mimosa is wholly owned by Mimosa Investments Limited, a Mauritius-based company held by Implats and Sibanye-Stillwater.

Mineral rights

The Mimosa mining rights are covered by a contiguous mining lease covering an area of 6 594 hectares. The mining lease, namely Lease No 24, was granted to Mimosa on 5 September 1996. The lease was registered for nickel, copper, cobalt, gold, silica, chromite and platinum group minerals and Mimosa Mining Company (Pvt) Ltd currently holds the mining rights to that lease. The lease agreement gives Mimosa exclusive mining rights for PGMs and base metals within the vertical limits of its boundary.

The GoZ has been pursuing the greater participation in the mining sector by indigenous Zimbabweans. Implats is continuing to engage with the GoZ with respect to agreeing plans for the indigenisation of Mimosa. The current position on the implementation of the indigenisation plans remains unclear and depending on what position is ultimately taken by the GoZ, Implats' attributable Mineral Resources and Mineral Reserves may be significantly reduced. The indigenisation plan has not been completed and the reported attributable Mineral Resources and Mineral Reserves are still at the same attributable ownership level of 50%.

	Mining right (ha)	Implats' interest (%)
Mimosa	6 594	50

Discussions continue with the GoZ regarding the studies and options for Mimosa Mine to beneficiate concentrate. Given the current depressed metal price regime it is for example seen that the potential implementation of a 15% beneficiation tax on platinum revenue could render Mimosa Mine unprofitable depending on future prices. Such a scenario will have a material impact on the Mimosa Mineral Resource and Mineral Reserve Statement. Given the above, it must be noted that Mimosa has the legal entitlement to the minerals being reported upon without any known impediments.

Infrastructure

The mining operation is well established with a mature infrastructure. The mine currently extracts 2 900Ml raw water per annum from the Khumalo weir. The weir is 6km from the mine and located in the Ngezi River. The river is supplied downstream from the Palawan Dam. Water is released from the dam for the mine and other water use permit holders.

The power supply to the mine is through a 132kV overhead powerline feeder teeing off Mberengwa switching station located some 15km south of the Mimosa Mine consumer sub-station. The maximum load capacity of the line feeding the mine consumer sub-station is 118MVA. It is adequate to accommodate an additional load.

The access surface tarred road to the mine is in a good condition and well maintained. The nearest railway station (Bannockburn) is 16km from the mine.

Environmental

Summary details pertaining to the Group environmental management and policy are listed on page 26. This includes the focus areas such as compliance, water stewardship, air quality, managing waste streams and promoting land management practices.

All environmental parameters are covered in the mine's Environmental Impact Assessment (EIA) covering the whole mining lease. Project specific EIAs are also carried out as and when required. Mimosa is certified to operate on ISO 14001 and OSHAS 18001 business management systems which cover the environmental and employees' occupational safety respectively. The ISO 14001 business management system has a comprehensive method of identifying, implementing, monitoring and tracking of all aspects and impacts of its activities to the environment. The ISO 14001 system is for the identification and control of hazards and associated risks to employees.

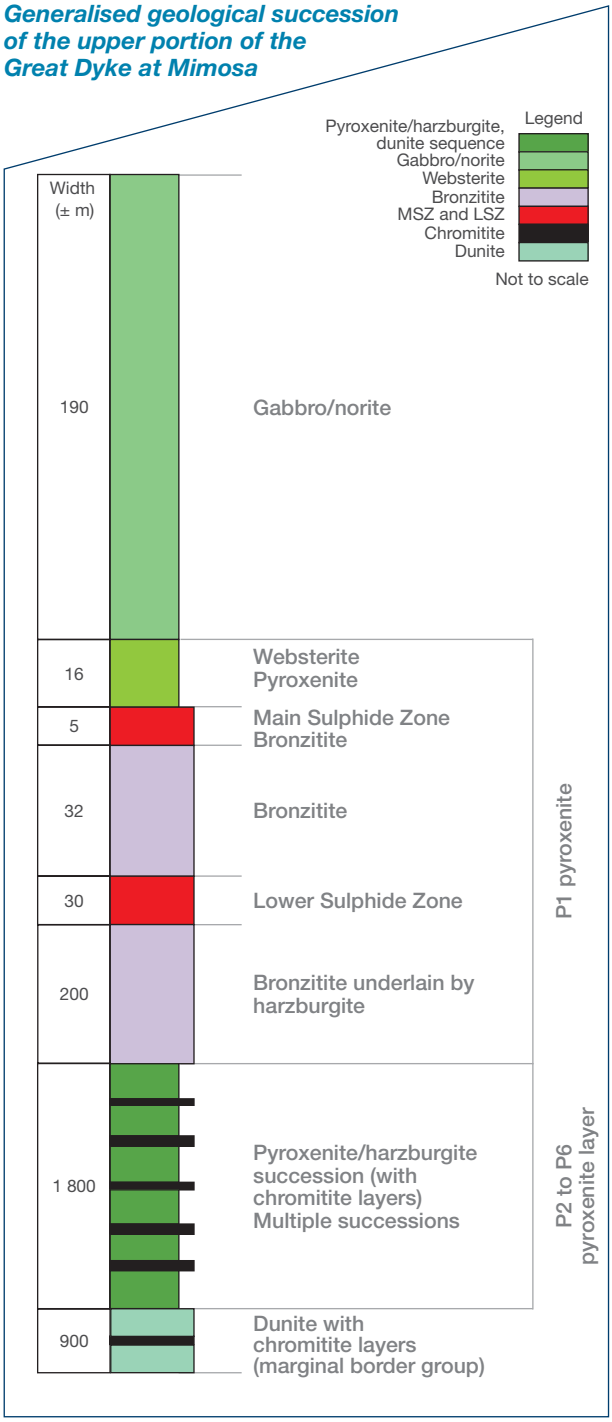
Geology

The geological succession at Mimosa is illustrated in the accompanying generalised stratigraphic column. PGM mineralisation at Mimosa is located in four erosionally isolated and fault-bounded blocks, namely, from north to south, the North Hill orebody, South Hill orebody, Mtshingwe block orebody and Far South Hill orebody areas. Each of these blocks is host to a pyroxenite layer known as the P1 pyroxenite layer which is overlain by a layer of gabbro. The platinum bearing Main Sulphide Zone (MSZ) is located in the P1 pyroxenite some 10m below the ultramafic/mafic contact. The MSZ is a continuous layer, 2m to 3m thick, and forms an elongated basin. The zone strikes in a north-northeasterly trend and dips at about 14° on the margins flattening towards the axis of the basin.

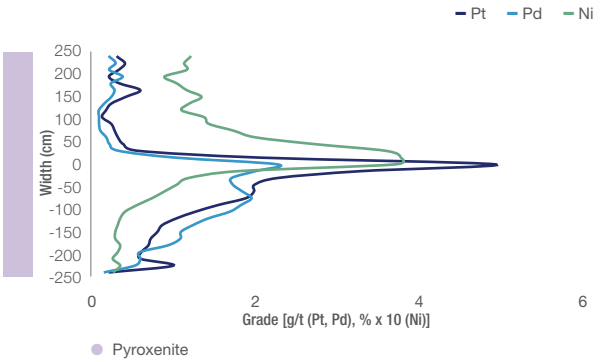
The MSZ at Mimosa has a well-defined grade profile where peak base metal and PGM values are offset vertically, with palladium dominant towards the base, platinum in the centre and nickel towards the top. At Mimosa the MSZ is visually identified using pyroxene and sulphide mineralisation followed by confirmatory channel sampling. Minor faults and dykes are present at Mimosa. Although no potholes have been identified, low-grade areas and areas of no mineralisation, or 'washouts', have been intersected. These are all accounted for in the Mineral Resource and Mineral Reserve Statement. The 6E metal ratios are shown in the accompanying graph. This is similar to the distribution at Zimplats.

Mimosa

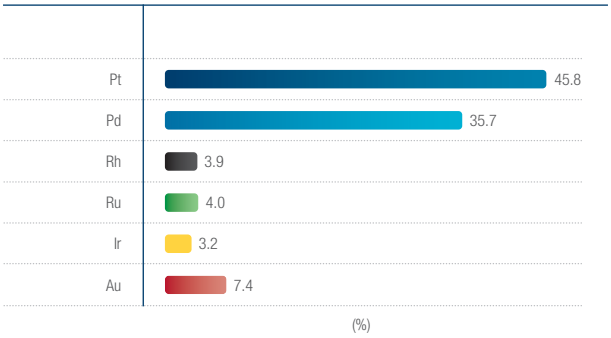
Generalised geological succession of the upper portion of the Great Dyke at Mimosa



Mimosa – MSZ



Mimosa MSZ 6E metal ratio as at 30 June 2018



Exploration

The lease area has been explored by a total of 480 exploration core-recovering boreholes of which 110 are on the North Hill deposit and 22 on the Far South Hill. The area has also been explored by surface mapping and trenching. The boreholes were drilled and assayed over a series of drilling campaigns spanning the life of the mine period. All drill core is largely NQ size though the unconsolidated part of the hole is drilled HQ size. All boreholes are logged lithologically and geotechnically. All lithological and assay data are verified for integrity before being imported into the database. Surface exploration drilling continued during the past year with some 2 586m in total drilled in 13 surface boreholes. Four of these boreholes were drilled for geotechnical assessments, seven to firm-up reef characteristics and two as initial pierce points into the historically unexplored Mtshingwe Block. Underground drilling was sustained, with 23 boreholes being drilled during the past year, mainly towards testing and confirming geological structures, ground conditions, unpay zones and potential water intersections ahead of advancing mining teams. Exploration activities will continue in the next year, with 1 200m being planned from six surface boreholes.

Mimosa

Mineral Resource estimation and reconciliation

The updated Mineral Resource estimates are tabulated below. The statement reflects the total Mineral Resource estimate for Mimosa as at 30 June 2018. Mineral Resources are quoted inclusive of Mineral Reserves. Mineral Resource estimates allow for estimated geological losses, while no allowance is made for anticipated support pillar losses during eventual mining. Mineral Resource grades are quoted *in situ*. The Mineral Resource estimates have been done using Surpac™ software to apply inverse distance techniques. Current Mineral Resource estimates have included recent drilling and assay results.

No Inferred Mineral Resources have been converted into Mineral Reserves. Rounding of numbers may result in minor computational discrepancies. Mineral Resource estimates are inherently imprecise in nature. The results tabulated in this report must be read as estimates and not as calculations. Inferred Mineral Resources in particular are qualified as approximations. The main change can be attributed to normal mining depletion.

The classification of Mineral Resources at Mimosa is informed by a matrix considering geological complexity and the confidence in the geostatistical estimation. In broad terms confidence is derived from surface borehole spacing and this has the largest weighting on classification of Mineral Resources:

- Borehole spacing less than 250m apart supports Measured Mineral Resources
- Borehole spacing between 250m and 500m supports Indicated Mineral Resources
- Borehole spacing greater than 500m supports Inferred Mineral Resources.

Mimosa Mineral Resources (inclusive reporting)

as at 30 June 2018

Orebody category		South Hill MSZ				North Hill MSZ				Far South Hill MSZ				
		Measured	Indicated	Inferred	Total	Measured	Indicated	Inferred	Total	Measured	Indicated	Inferred	Total	Total
Tonnes	Mt	36.2	13.1	11.3	60.5	18.0	16.3	9.6	43.8	4.3	1.5	6.0	11.7	**116.1**
Width	cm	200	200	200		200	200	200		200	200	200		
4E grade	g/t	3.80	3.50	3.46	3.67	3.48	3.62	3.54	3.54	3.70	3.87	3.54	3.64	**3.62**
6E grade	g/t	4.03	3.74	3.69	3.90	3.68	3.84	3.58	3.72	3.93	4.12	3.76	3.87	**3.83**
Ni	%	0.14	0.15	0.14	0.14	0.14	0.16	0.14	0.15	0.14	0.15	0.13	0.14	**0.14**
Cu	%	0.11	0.12	0.12	0.11	0.10	0.12	0.11	0.11	0.11	0.11	0.10	0.11	**0.11**
4E oz	Moz	4.4	1.5	1.3	7.1	2.0	1.9	1.1	5.0	0.5	0.2	0.7	1.4	**13.5**
6E oz	Moz	4.7	1.6	1.3	7.6	2.1	2.0	1.1	5.2	0.5	0.2	0.7	1.5	**14.3**
Pt oz	Moz	2.2	0.7	0.6	3.5	1.0	0.9	0.5	2.5	0.3	0.1	0.3	0.7	**6.7**
Pd oz	Moz	1.7	0.6	0.5	2.8	0.8	0.7	0.4	1.9	0.2	0.1	0.2	0.5	**5.2**

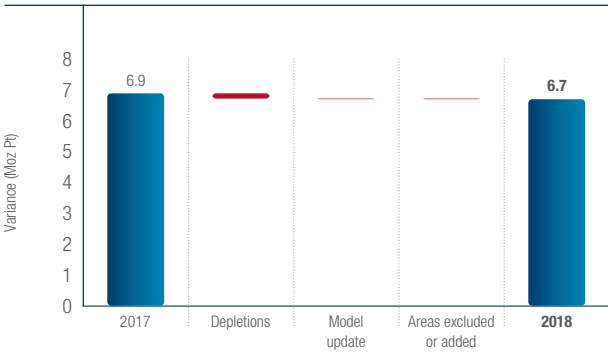
as at 30 June 2017

Orebody category		South Hill MSZ				North Hill MSZ				Far South Hill MSZ				
		Measured	Indicated	Inferred	Total	Measured	Indicated	Inferred	Total	Measured	Indicated	Inferred	Total	Total
Tonnes	Mt	39.7	13.1	11.3	64.2	18.0	16.3	9.5	43.8	4.3	1.4	6.0	11.7	**119.7**
Width	cm	200	200	200		200	200	200		200	200	200		
4E grade	g/t	3.77	3.47	3.45	3.65	3.47	3.61	3.53	3.54	3.70	4.27	3.38	3.61	**3.61**
6E grade	g/t	4.00	3.69	3.63	3.87	3.68	3.84	3.74	3.75	3.93	4.52	3.61	3.84	**3.82**
Ni	%	0.14	0.14	0.14	0.14	0.14	0.16	0.14	0.15	0.14	0.15	0.13	0.14	**0.14**
Cu	%	0.11	0.11	0.12	0.11	0.10	0.12	0.11	0.11	0.11	0.11	0.10	0.11	**0.11**
4E oz	Moz	4.8	1.5	1.3	7.5	2.0	1.9	1.1	5.0	0.5	0.2	0.6	1.4	**13.9**
6E oz	Moz	5.1	1.6	1.3	8.0	2.1	2.0	1.1	5.3	0.5	0.2	0.7	1.4	**14.7**
Pt oz	Moz	2.4	0.7	0.6	3.7	1.0	0.9	0.5	2.5	0.3	0.1	0.3	0.7	**6.9**
Pd oz	Moz	1.9	0.6	0.5	2.9	0.8	0.7	0.4	1.9	0.2	0.1	0.2	0.5	**5.4**

Mimosa

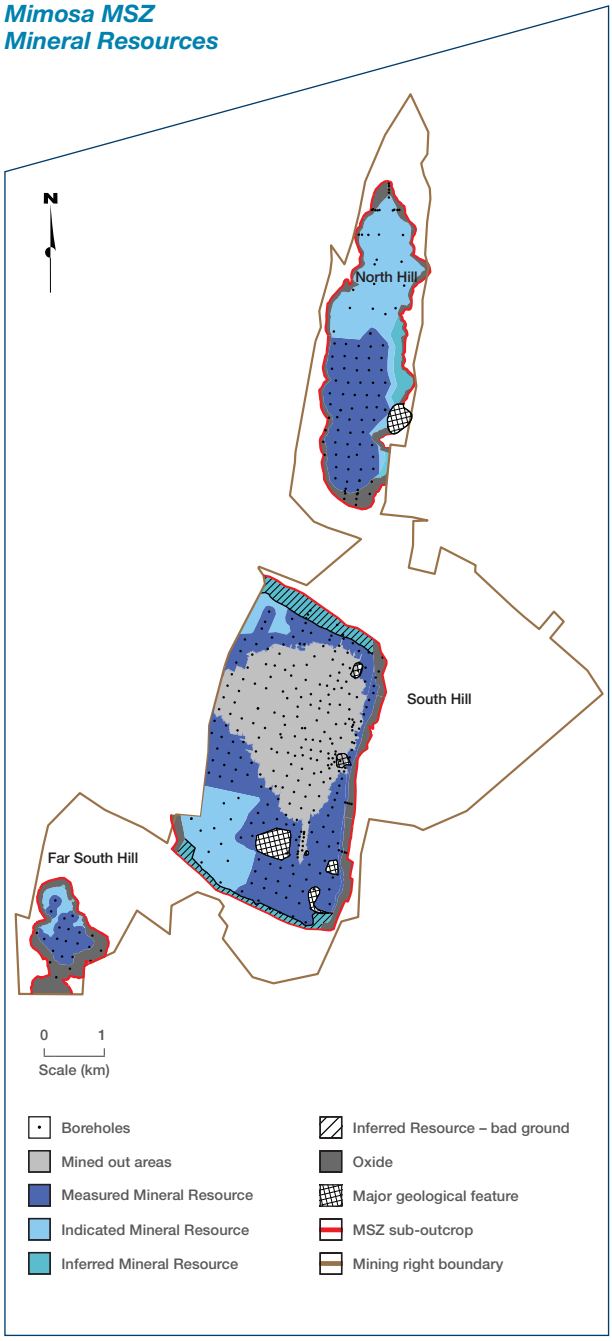
The year-on-year comparison of the Mimosa Mineral Resources shows no material change. The reconciliation of the Mineral Resources is mostly impacted by normal mining depletion and reflect a 3% year-on-year decrease in the estimate.

Total Mimosa Mineral Resources as at 30 June 2018



Ground penetrating radar survey

Mimosa MSZ Mineral Resources



Mimosa

Modifying factors

The modifying factors used to convert Mineral Resources to Mineral Reserves are derived from historical performance while taking future anticipated conditions into account. Implats' long-term price assumptions in today's money (supporting Mineral Reserve estimates) are shown on pages 5 and 25. The following other modifying factors were applied to the Mineral Resources:

Key factors and assumptions

Main Sulphide Zone	Factors
Geological losses	11 – 26%
Mineral Resource area	23 million ca
Pillar factors	22 – 28%
Resource dilution	8 – 12%
Mine call factor	92 – 96%
Relative density	3.15 – 3.18
Channel width	200cm
Stoping width	200cm
Concentrator recoveries	78 – 80%

Mining methods and mine planning

Mimosa is a shallow underground mine accessed by the Blore Decline Shaft system. The bord and pillar mining method is employed and stoping widths average around 2m. The bord widths vary from 6m to 15m wide, depending on the ground control district. Minimum pillar sizes are dependent on depth to give a safety factor of greater than 1.6, with pillars being 10m x 3m above 16 level, 10m x 3.5m from 16 level and below, 10m x 4.5m and 4m x 8m in 6m bords in special areas as determined by the ground control districts. The strike pillars in panels are elongated along strike to cater for the predominant east-west faults and dykes and to avoid shear movement down-dip. Mining bords advance along strike. The mining cycle involves mechanised support drilling and installation, mechanised face drilling, charging and blasting and mechanised lashing onto a conveyor network to an underground bunker. From the bunker ore is conveyed out to a surface stockpile.

Optimum stoping widths and mining cut selection are regularly reviewed given variation in metal prices and the non-linear distribution of the different metals. Mining models are defined relative to the platinum peak and recent work confirmed that a 200cm slice is presently the optimum cut. The Mineral Resources and Mineral Reserves listed on pages 92 and 96 are based on a slice that extends from 45cm above the platinum peak datum to 155cm below the datum. The reported mined grade is based on inverse distance block modelling of borehole values using Surpac™. Mine design and scheduling is done using MineShed™. The mine plan is derived from a target milling throughput. Strategic stockpile levels are factored into the volumes to be hoisted. Losses due to mining and geology are applied to the planned tonnages and then consolidated into the LoM profile. The LoM I depicted overleaf includes on-reef stoping from the Wedza Shaft Mineral Reserve area into the southern part of the South Hill orebody known as the Mtshingwe area. The updated LoM indicates the mine plan, which dictated accelerated mining of the Mtshingwe block, in order to deliver a constant head grade to the mill.

Several LoM scenarios are being evaluated at present in order to optimise the orebody. The LoM graph for Mimosa is shown on the following page. Work is under way to assess various options to optimise the Mineral Resources of Mimosa. The illustration on the following page only reflects the LoM I profile at South Hill. This is a combination of the Wedza and Mtshingwe Mineral Reserves.

Mimosa

Mimosa 20-year LoM Pt ounce profile as at 30 June 2018 (in concentrate)

Mineral Reserve estimation and reconciliation

The updated Mineral Reserve estimates are tabulated on page 96. The statement reflects the total Mineral Reserve estimate for Mimosa as at 30 June 2018. Mineral Reserve grades are quoted after applying mine to mill modifying factors. Current Mineral Reserve estimates have included the latest drilling, assay results, mine design and updated modifying factors.

The Mineral Reserves quoted reflect anticipated grades delivered to the mill and estimations are aligned to the business plan by estimating tonnes and grades at 200cm mining width. No Inferred Mineral Resources have been converted into Mineral Reserves. The Mineral Reserve Statement as at 30 June 2018 now includes all of the Mtshingwe Shaft area below the 40m depth. This conversion was reviewed given the prior project approval, LoM planning and positive economic contribution. Rounding of numbers may result in minor computational discrepancies. The results tabulated in this report must be read as estimates and not as calculations. The updated pillar design in selected ground district areas impacted on the overall extraction rate. The conversion and classification of Mineral Reserves at Mimosa is informed by:

- Feasible mine plan and project studies, Board approval and available funding
- Economic testing at given market conditions (price deck)
- Indicated Mineral Resources can be classified as Probable Mineral Reserves if the mine plan, approval, funding and economic test is passed
- Measured Mineral Resources can be classified as Proved Mineral Reserves if the mine plan, approval, funding and economic test is passed
- In certain exceptional circumstances the Competent Person may elect to convert Measured Mineral Resources to Probable Mineral Reserves if the confidence in the modifying factors is being confirmed
- No Inferred Mineral Resources are converted to the Mineral Reserve category.

Underground workshop, Mimosa

Mimosa

Mimosa Mineral Reserves

as at 30 June 2018

Orebody category		South Hill MSZ (Wedza) Proved	Probable	Total	South Hill MSZ (Mtshingwe) Proved	Probable	Total	Total
Tonnes	Mt	11.4	1.6	13.0	11.7	9.7	21.4	**34.3**
Width	cm	200	200		200	200		
4E grade	g/t	3.39	3.26	3.37	3.67	3.38	3.54	**3.48**
6E grade	g/t	3.61	3.49	3.60	3.96	3.66	3.82	**3.74**
Ni	%	0.15	0.14	0.15	0.13	0.15	0.14	**0.14**
Cu	%	0.11	0.11	0.11	0.10	0.12	0.11	**0.11**
4E oz	Moz	1.2	0.2	1.4	1.4	1.0	2.4	**3.8**
6E oz	Moz	1.3	0.2	1.5	1.5	1.1	2.6	**4.1**
Pt oz	Moz	0.6	0.1	0.7	0.7	0.5	1.2	**1.9**
Pd oz	Moz	0.5	0.1	0.5	0.5	0.4	0.9	**1.5**

as at 30 June 2017

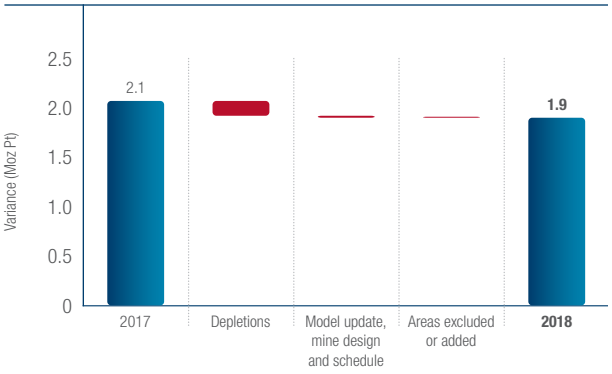
Orebody category		South Hill MSZ (Wedza) Proved	Probable	Total	South Hill MSZ (Mtshingwe) Proved	Probable	Total	Total
Tonnes	Mt	14.0	1.6	15.5	12.1	9.7	21.8	**37.3**
Width	cm	200	200		200	200		
4E grade	g/t	3.44	3.27	3.42	3.66	3.38	3.54	**3.49**
6E grade	g/t	3.68	3.48	3.66	3.95	3.66	3.82	**3.76**
Ni	%	0.15	0.14	0.15	0.13	0.15	0.14	**0.15**
Cu	%	0.11	0.11	0.11	0.10	0.12	0.11	**0.11**
4E oz	Moz	1.5	0.2	1.7	1.4	1.0	2.5	**4.2**
6E oz	Moz	1.7	0.2	1.8	1.5	1.1	2.7	**4.5**
Pt oz	Moz	0.8	0.1	0.8	0.7	0.5	1.2	**2.1**
Pd oz	Moz	0.6	0.1	0.7	0.5	0.4	0.9	**1.6**

Molten metal sampling, Impala

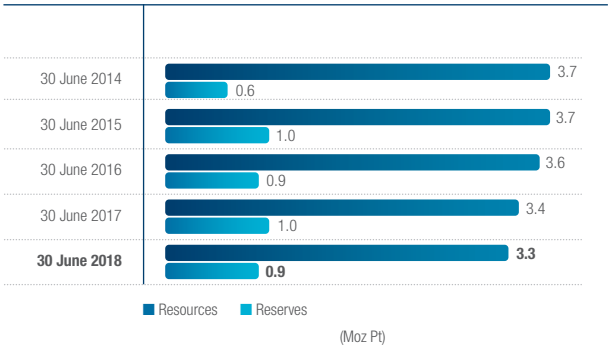
Mimosa

The year-on-year comparison indicates that there has been changes since the 30 June 2017 statement. The main change can be attributed to the conversion of the southwestern Indicated Mineral Resources of South Hill to probable Mineral Reserves and also the upgrading of some Probable Mineral Reserves to the Proved category. Other changes relate to normal mining depletion.

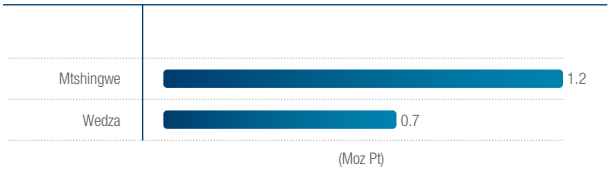
Total Mimosa Mineral Reserves as at 30 June 2018



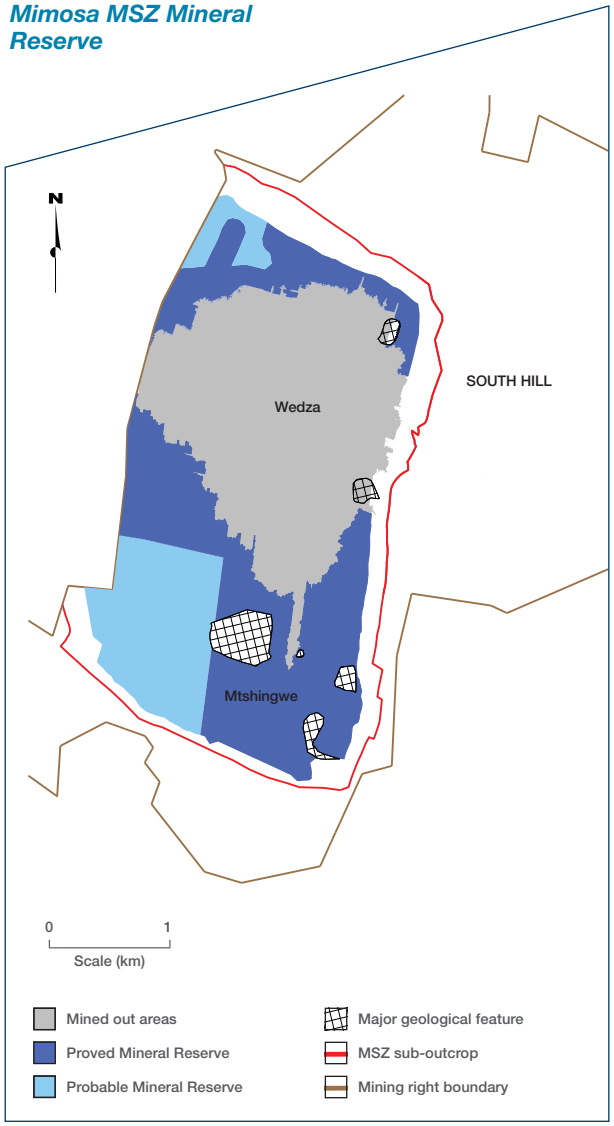
Mimosa attributable Mineral Resources and Mineral Reserves as at 30 June 2018



Mimosa Mineral Reserve distribution as at 30 June 2018

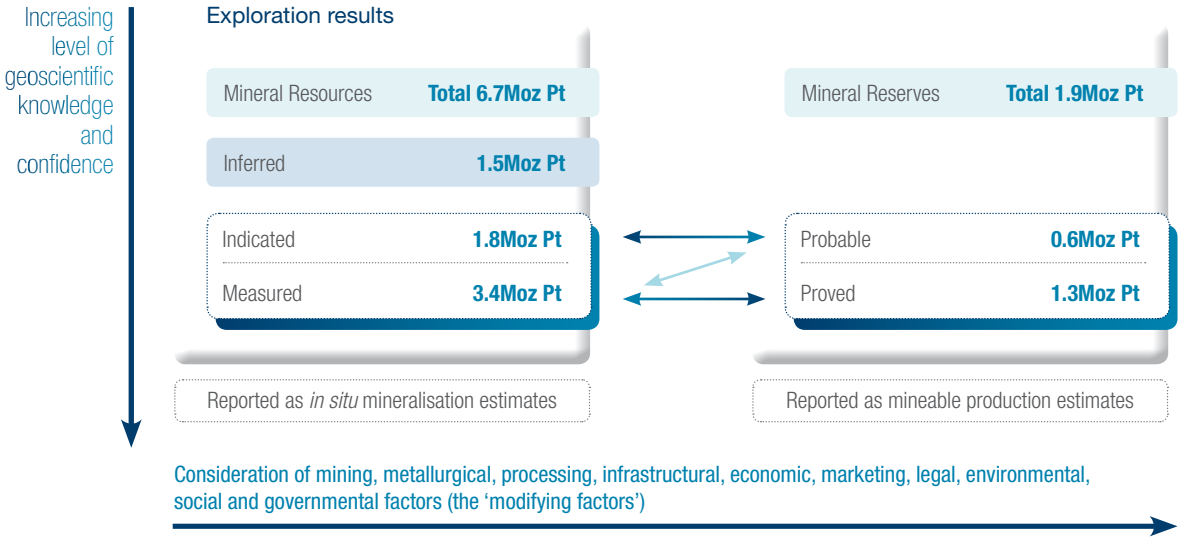


Mimosa MSZ Mineral Reserve



Mimosa

Relationship between exploration results, Mineral Resources and Mineral Reserves (100%)



Processing

Mimosa has a concentrator plant on site where initial processing is done. Concentrate is transported by road to Impala Mineral Processes in Rustenburg in terms of an offtake agreement with Impala. An alternative option for local beneficiation is being pursued. A feasibility study is also in progress to investigate the viability to increase output by some 30%.

Mimosa top risks

The Group risk management process is briefly described on page 12 where the Implats Group top risks are listed.

In this context the top risks identified at Mimosa are:

> Metal price fluctuations
> Foreign currency shortages
> Availability and cost of capital
> Taxation and indigenisation
> Social licence to operate
> Concentrates and key materials transportation disruptions
> Geotechnical conditions
> Security and cost of electricity
> Cyber security incident.

Valuation

The economic viability of the Mimosa Mineral Reserves is tested by Implats by means of net present value calculations over the LoM of the Mineral Reserve, determining the lowest real rand basket price that would still render the Mineral Reserve viable. These calculations generate basket prices based on the local PGM metal ratios and differs from the overall Group basket prices. This is then tested against the internal Mimosa estimate of the real long-term basket price and the spot price as at 30 June 2018. These tests by Implats indicate that the Mimosa operation requires a real long-term basket price of between R24 000 and R25 600 to be economically viable. While the real spot basket price for Mimosa as at 30 June 2018 was R30 480 (US$2 200), the Mimosa internal long-term real basket price is R32 050 (US$2 470).

Compliance

Mimosa has adopted the SAMREC Code for its reporting. The Lead Competent Person for Mimosa's Mineral Resources is Dumisayi Mapundu (CertNatSci SACNASP), a full-time employee of Mimosa with 24 years of relevant experience. The Lead Competent Person for Mimosa's Mineral Reserves is Alex Mushonhiwa (SAIMM), a full-time employee of Mimosa with 28 years of relevant experience. Implats has written confirmation from the Competent Persons that the information disclosed in terms of these paragraphs are compliant with the SAMREC Code and, where applicable, the relevant SAMREC Table 1 and JSE Section 12 requirements and that it may be published in the form, format and context in which it was intended..

Mimosa

Key operating statistics

		FY2018	FY2017	FY2016	FY2015	FY2014
Production						
Tonnes milled ex mine	(000t)	**2 802**	2 729	2 641	2 586	2 453
Head grade 6E	(g/t)	**3.84**	3.83	3.88	3.93	3.92
Platinum in concentrate	(000 oz)	**125**	122	120	117	110
PGM in concentrate	(000 oz)	**266**	259	254	250	235
Cost of sales	(Rm)	**(3 129)**	(3 341)	(3 372)	(2 640)	(2 398)
On-mine operations	(Rm)	**(1 705)**	(1 784)	(1 764)	(1 375)	(1 425)
Concentrating operations	(Rm)	**(582)**	(581)	(632)	(501)	(375)
Other	(Rm)	**(842)**	(976)	(976)	(764)	(598)
Total cost	(Rm)	**2 443**	2 506	2 525	2 043	1 958
Per tonne milled	(R/t)	**872**	918	956	790	798
	($/t)	**68**	67	66	69	77
Per Pt oz in concentrate	(R/oz)	**19 544**	20 609	21 094	17 402	17 768
	($/oz)	**1 521**	1 511	1 463	1 525	1 713
Financial ratios						
Gross margin ex mine	(%)	**19.4**	5.2	(3.3)	22.9	19.3
Capital expenditure	(Rm)	**568**	445	456	343	349
	($m)	**44**	33	32	30	34

Grade control by means of XRF scanning at Zimplats

Afplats

THE AFPLATS LEEUWKOP MINE IS LOCATED APPROXIMATELY 15KM WEST OF THE TOWN OF BRITS.

Location

The Afplats Leeuwkop Mine is located approximately 15km west of the town of Brits in the North West province and some 2km due west of the R566 road to Sun City. The area is bordered to the west and south by Western Platinum, and Eastern Platinum, two of the operations in the Lonmin Group. The Inkosi and Imbasa prospecting areas ownership changed during 2017, and Implats has no remaining interest in this area.

Afplats

History

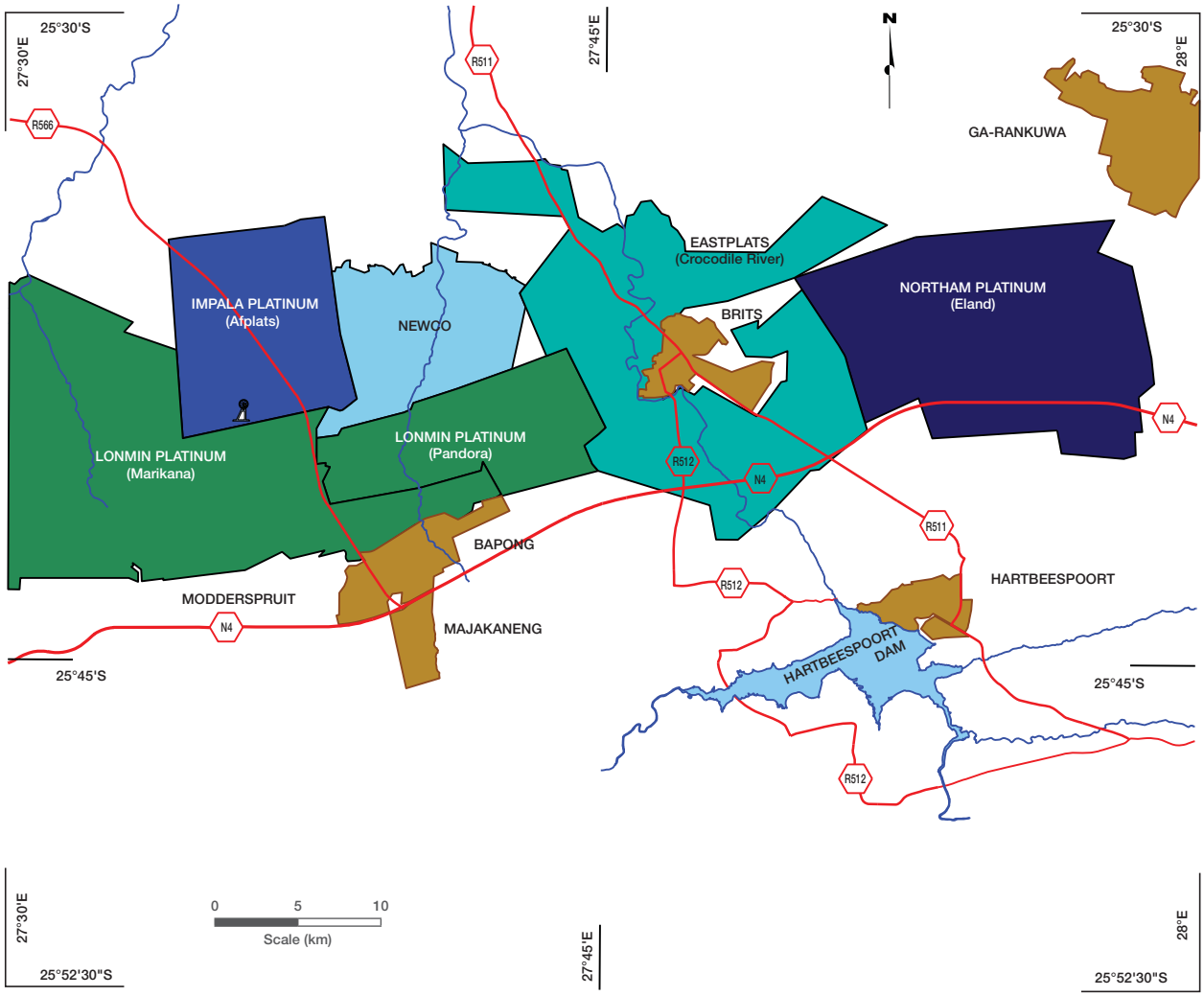
Since the dissolution of African Platinum Plc, the Afplats mineral rights are held by Implats together with a joint venture partner. The ownership of Afplats comprising the farms Leeuwkop, Kareepoort and Wolvekraal, is jointly owned by Implats (74%) and the Bakwena community (Ba-Mogopa Platinum Investments (Pty) Ltd, 26%).

In November 2010 the respective boards approved the commencement of a feasibility study at Afplats, with the early work for the pre-sink of the Leeuwkop main shaft commencing on 1 April 2011. This feasibility study was completed in 2011.

During November 2013, a decision was made that another feasibility study be undertaken that would convert the conventional mining layout into a bord and pillar layout. This work was completed by December 2014, by which time the main shaft had been sunk to 1 198m below surface, having traversed the Merensky Reef.

The vertical shaft sinking project has been stopped and the Leeuwkop Project has been deferred for five years.

Regional locality map showing PGM mineral rights and infrastructure in the Afplats surroundings



Afplats

Mineral Rights

Afplats is currently the holder of the Leeuwkop mining right, under Mining Right number MR 40/2008 (DMR Ref No NW 30/5/1/2/2/256MR), in respect of the farm Leeuwkop 402 JQ to mine platinum group metals and other base metals and by-products.

Afplats is furthermore the holder of the Kareepoort 407 JQ and Wolvekraal 408 JQ prospecting right (DMR ref: NW 30/5/1/1/2/1033PR) relating to all minerals, excluding dimension stone. The prospecting right was awarded for a five-year period, renewable for a maximum of three more years. The expiry date of the prospecting right was 26 June 2012. The renewal application was manually lodged with DMR on 23 March 2012.

An application was lodged on 6 June 2013, to obtain the written consent of the Minister, under Section 102 of the MPRDA to amend the Afplats mining right by incorporating the prospecting area into the existing mining right. This application has not been executed yet.

Afplats has submitted its detailed Section 52 application on 15 December 2015 in terms of the MPRDA. It has advised the Minister of Mineral Resources of the deferment of the Afplats Leeuwkop Mine Project relating to the Afplats Leeuwkop Mining Right No 40/2008 under DMR Ref No NW 30/5/1/2/2/256.

	Mining right (ha)	Prospecting right (ha)	Implats' interest (%)
Afplats	4 602	1 065	74

Previous reports reflected Implats' interest in Inkosi Mining (Pty) Ltd (Inkosi) and Imbasa (Pty) Ltd (Imbasa). During the past year the Implats Board resolved to exit the interest held in these entities and to this effect these areas are not included in the current report. A sale process is underway.

Infrastructure

Afplats' Leeuwkop Shaft is accessed by an existing 1.8km tarred road, from the existing provincial road R556. The current infrastructure includes, the shaft sinking headgear and winder houses, electricity supply by Eskom through the Big Horn sub-station, potable water supply from the Madibeng Municipality, offices and change houses for the sinking contractor and Afplats employees, the exploration core yard used by Afplats is also situated here. All infrastructure is in a secured fenced off area.

Environmental

Summary details pertaining to the Group environmental management and policy are listed on page 26. This includes the focus areas such as compliance, water stewardship, air quality, managing waste streams and promoting land management practices.

Surface topography, geohydrological reports and environmental study recommendations have been taken into account in positioning of the future surface infrastructure. The location of known heritage sites have been identified and demarcated. Suitable positions have been identified for the future waste dump and tailings dam.

Detailed drainage arrangements were designed to ensure that the separation of clean and dirty water takes place, as no uncontrolled water run-off is permitted.

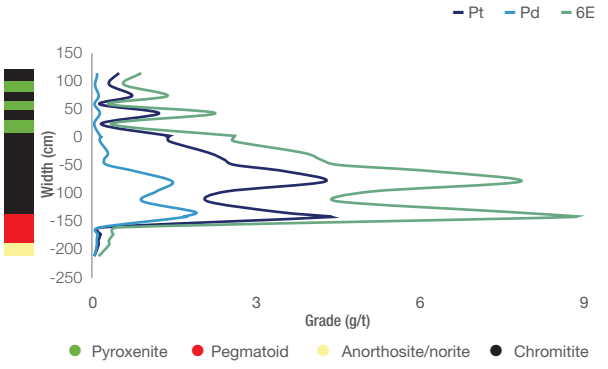
A noise berm of adequate dimension to the south of the Leeuwkop Shaft has been designed, that will minimise possible noise interference with the local village of Segwaelane some 800m away from the shaft.

Geology

Both the Merensky and UG2 Reefs have been explored at Afplats but only the UG2 Reef is currently considered to be economically exploitable. The UG2 Reef comprises a main and upper chromitite layer separated by narrow pyroxenite partings. This will be exploited as a single package. The Merensky Reef is the upper portion of the pyroxenite layer, with a very thin chromitite stringer close to the hangingwall contact. Mineralisation peaks over the chromitite stringer and decreases into the footwall. The UG2 Reef occurs about 1 050m below surface at the southern boundary of the Leeuwkop farm. The vertical separation between the Merensky and UG2 Reefs averages 200m and both reefs dip northwards at 9°.

The reefs will be disrupted by minor and major faults, dolerite dykes, late stage ultramafic replacement pegmatoid bodies and potholes.

Afplats – UG2



Afplats

The UG2 Chromitite Layer consists of two layers of chromitite, separated by thin layers of pyroxenite and is on average 1.30m thick across the Afplats area. From a mining perspective it would be impractical and dangerous to mine the Lower UG2 Chromitite Layer with a higher grade without the inclusion of the Upper UG2 Chromitite Layer with a lower grade. The two UG2 Chromitite Layers were combined in the grade estimation and reported as the Mineral Resource width.

All the known geological losses are discounted from the Mineral Resources and a factor for the unknown geological losses is applied to the remainder of the areas. The global extraction rate for Afplats is 78%.

Mining methods and mine planning

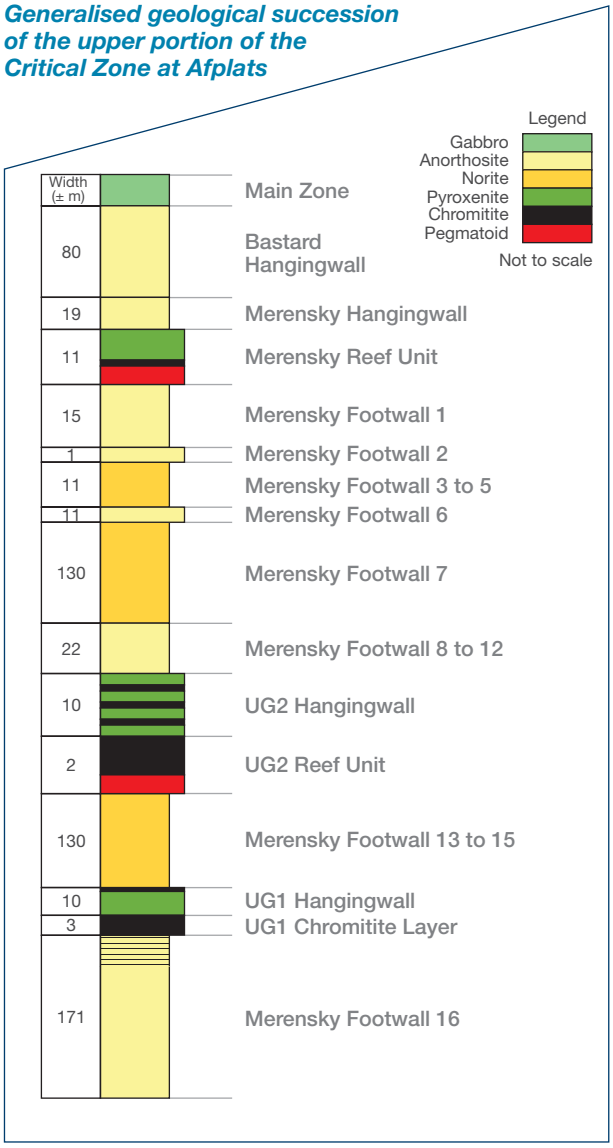
A feasibility study was completed in 2011, based on a conventional mining method layout. This feasibility study was approved by the Implats Board.

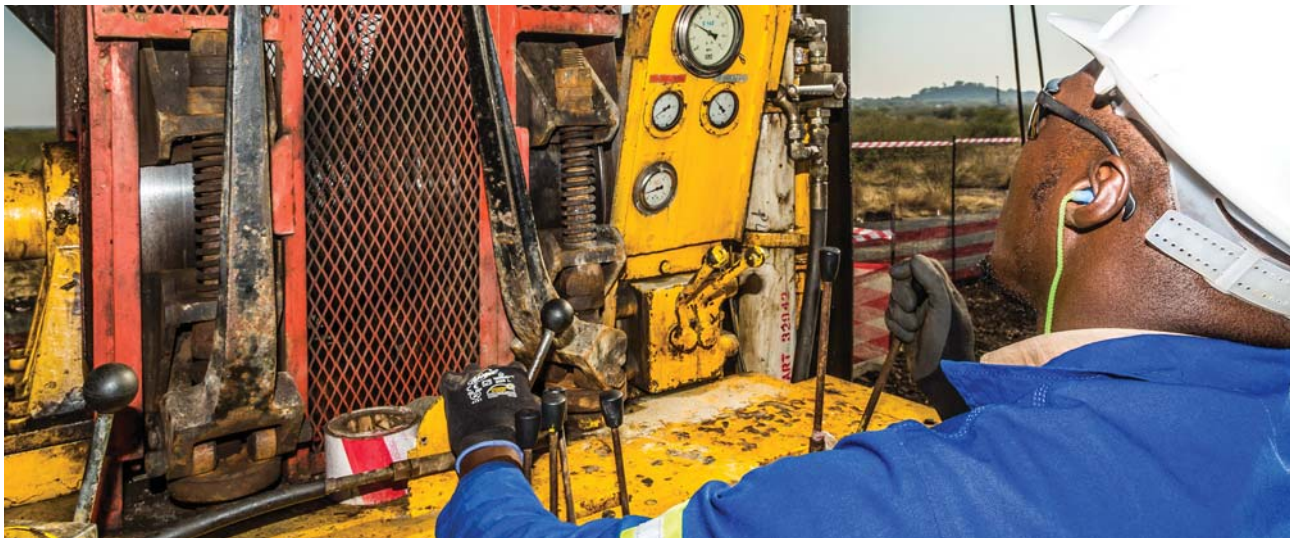
During November 2013, a decision was made that another feasibility study be undertaken that would convert the conventional mining layout into a bord and pillar layout.

The mine planning was completed in 3D spatial environment and the shaft sinking layout was updated to suit the mining method. This work was completed in December 2014, but not approved by the Implats Board. The Mineral Resource has therefore not been reclassified to the Mineral Reserve category pending the full project approval and funding in accordance with Implats' practice. The feasibility study area represents 42% of the Afplats Mineral Resource area.

The vertical shaft sinking project has been stopped and the Leeuwkop Project has been deferred for five years. By December 2014, the Main Shaft has progressed to a depth of 1 198m below surface above the planned shaft bottom position of 1 396m below surface.

Generalised geological succession of the upper portion of the Critical Zone at Afplats





Surface drilling operator

Afplats

Mineral Resource estimation and reconciliation

The Mineral Resources team that completed the work for this period consists of the MRM Department at Impala, consisting of geology, planning, the geostatistics section and the approval by the Implats Resource and Reserve committee members.

No additional data was added to the Mineral Resource estimation. The following notes should be read in conjunction with the Mineral Resource table:

> The statement above reflects the total estimate for Afplats, the attributable Mineral Resources are reported in the summary sections
> Implats has chosen not to publish Merensky Reef Mineral Resource estimates as the eventual economic extraction is presently in doubt
> The estimate has been conducted using the Isatis™ software. A multi-pass search was used for the estimation, capping of extreme values was applied for UG2 Reef data
> There is no change in the UG2 Reef Mineral Resource estimate since the previous statement
> The Mineral Resources are reflected in both 4E and 6E formats
> Rounding of numbers may result in minor computational discrepancies; Mineral Resource estimates are inherently imprecise in nature; the results tabulated in this report must be read as estimates and not as calculations; Inferred Mineral Resources in particular are qualified as approximations
> The base metals grades are reflected in the Mineral Resource table below.

Afplats Mineral Resources (inclusive reporting)

as at 30 June 2018

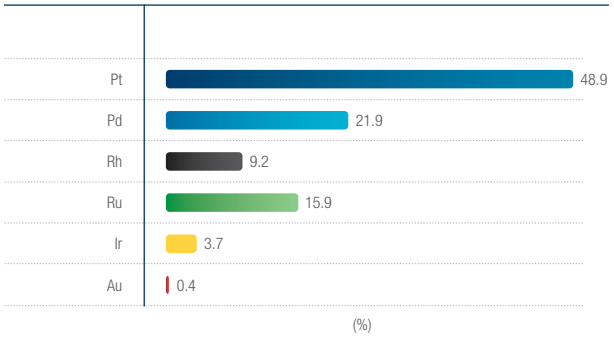
Orebody category		Afplats UG2				Imbasa UG2			Inkosi UG2			
		Measured	Indicated	Inferred	Total	Indicated	Inferred	Total	Indicated	Inferred	Total	Total
Tonnes	Mt	98.4	10.8	55.9	165.1							**165.1**
Width	cm	133	136	129								
4E grade	g/t	5.19	5.11	5.06	5.14							**5.14**
6E grade	g/t	6.47	6.36	6.25	6.39							**6.39**
Ni	%	0.03	0.03	0.03	0.03							**0.03**
Cu	%	0.01	0.01	0.01	0.01							**0.01**
4E oz	Moz	16.4	1.8	9.1	27.3							**27.3**
6E oz	Moz	20.5	2.2	11.2	33.9							**33.9**
Pt oz	Moz	10.0	1.1	5.5	16.6							**16.6**
Pd oz	Moz	4.5	0.5	2.5	7.4							**7.4**

as at 30 June 2017

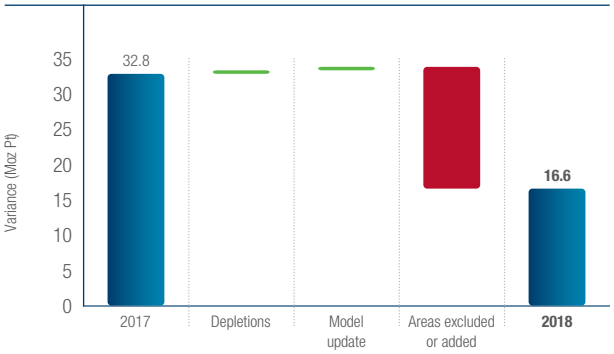
Orebody category		Afplats UG2				Imbasa UG2			Inkosi UG2			
		Measured	Indicated	Inferred	Total	Indicated	Inferred	Total	Indicated	Inferred	Total	Total
Tonnes	Mt	98.4	10.8	55.9	165.1	28.2	40.2	68.4	67.9	38.4	106.3	**339.8**
Width	cm	133	136	129		137	144		135	142		
4E grade	g/t	5.19	5.11	5.06	5.14	4.59	4.53	4.56	4.87	4.64	4.74	**4.91**
6E grade	g/t	6.47	6.36	6.25	6.39	5.74	5.70	5.72	6.14	5.88	5.99	**6.15**
Ni	%	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	**0.03**
Cu	%	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	**0.01**
4E oz	Moz	16.4	1.8	9.1	27.3	4.2	5.9	10.0	10.6	5.7	16.4	**53.7**
6E oz	Moz	20.5	2.2	11.2	33.9	5.2	7.4	12.6	13.4	7.3	20.7	**67.1**
Pt oz	Moz	10.0	1.1	5.5	16.6	2.6	3.6	6.2	6.6	3.6	10.1	**32.8**
Pd oz	Moz	4.5	0.5	2.5	7.4	1.1	1.6	2.8	2.9	1.6	4.5	**14.7**

Afplats

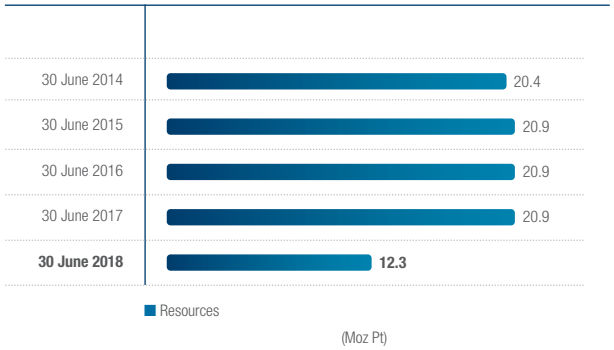
Afplats, UG2 6E metal ratio as at 30 June 2018



Total Afplats Mineral Resources as at 30 June 2018



Afplats attributable Mineral Resources as at 30 June 2018



Compliance

Implats is committed to independent third-party reviews of Mineral Resource and Mineral Reserve estimates. These reviews, which provide assurance and assist with the principle of continuous improvement, are undertaken on a two-year cycle.

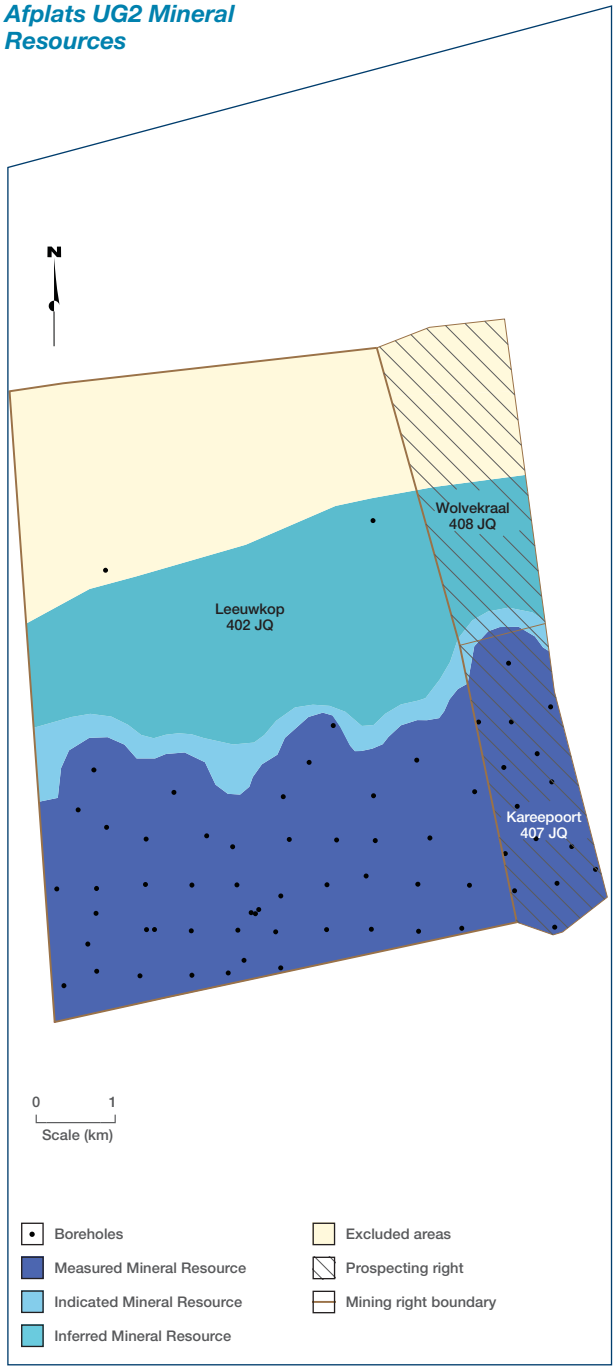
The Lead Competent Person for Afplats is Jacolene de Klerk, a full-time employee of Impala. The Competent Person, PrSciNat SACNASP Registration No: 400085/10, has 13 years' relevant experience.

Implats has written confirmation from the Lead Competent Person that the information disclosed in terms of these paragraphs is compliant with the SAMREC Code and, where applicable, the relevant SAMREC Table 1 and JSE Section 12 requirements, and that it may be published in the form, format and context in which it was intended.

Field inspection of borehole core

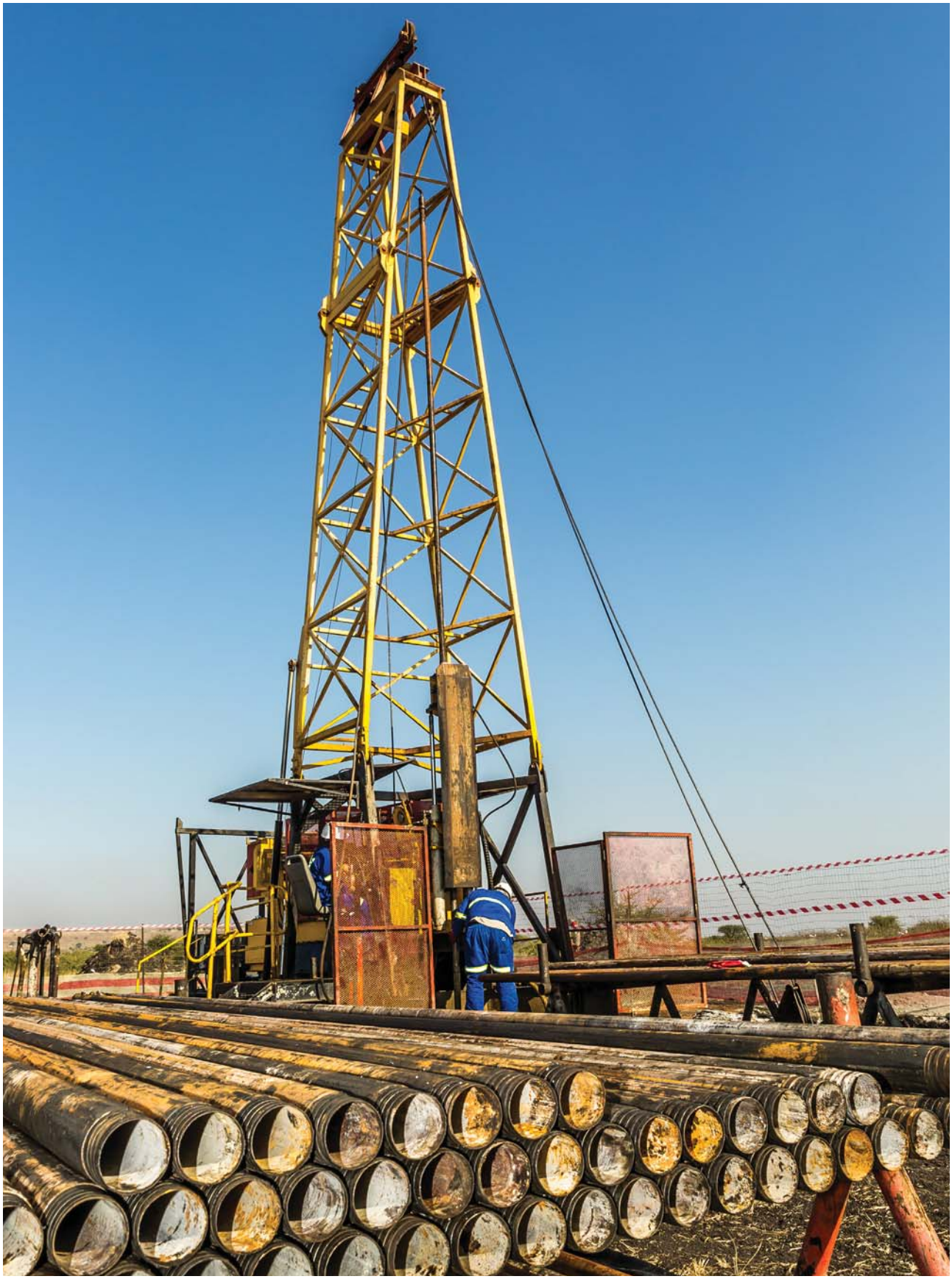
Afplats

Afplats UG2 Mineral Resources



Underground borehole core logging at 16 Shaft, Impala

Afplats



Exploration drill rig at Impala

Chromium ore at Implats

THE WORLD CHROMIUM ORE PRODUCTION ORIGINATES FROM THE MINERAL CHROMITE (A CHROMIUM-IRON OXIDE) IN THE ROCK OR ORE CALLED CHROMITITE. THE MAJORITY OF THE CHROMIUM MINERAL RESOURCES OF THE WORLD ARE TO BE FOUND IN THE BUSHVELD COMPLEX OF SOUTH AFRICA AND THE GREAT DYKE OF ZIMBABWE, WHERE IT OCCURS AS NUMEROUS THIN AND LATERALLY CONTINUOUS STRATIFORM CHROMITITE LAYERS, INTERLAYERED WITH MAFIC AND ULTRAMAFIC ROCKS.

Up to 11 chromitite layers are known in the Great Dyke, named from the top down as Seams 1 to 11. Thirteen chromitite layers are known in the Bushveld Complex, which are further clustered into three groups, ie, the lower, middle and upper groups of chromitite layers. Named from the bottom up, these are termed LG1 to LG7, MG1 to MG4 and the UG1 and UG2. In places, individual chromitite layers may comprise multiple layers of subsidiary chromitite units, separated by intercalated silicate units.

Although some of the chromitite layers have been known since 1865, limited mining only commenced in 1916 in the Bushveld Complex and in 1919 on the Great Dyke. The use and mining of chromium escalated after the conclusion of the Second World War, with approximately half of the total world chromium ore production being mined from the Bushveld Complex.

In the Bushveld Complex, only the LG6, MG1 and UG2 chromitite layers are amenable to underground mining.

The uppermost chromitite layer (UG2) occurs at a depth range of 50m and 400m below the Merensky Reef and hosts economically exploitable quantities of PGMs within the chromitite. The UG2 chromitite layer is therefore mined at all Implats' operations, principally for the PGMs. Chromium can therefore be seen as a by-product of the UG2 Reef in South Africa. The LG6 and MG1, with an average Cr_2O_3 grade of between 40% and 50%, occurs more than 250m below the UG2 Reef. These units can therefore not be mined from the existing infrastructure at the Implats' operations and are mined by other operators close to surface in opencast and underground mining operations for the chromium content only.

The UG2 Reef at **Impala** has an average *in situ* Cr_2O_3 grade of approximately 33%, and a mined grade of about 16%. The mined ore from the UG2 Reef is milled and processed to recover the PGMs at the mine's two PGM concentrator plants. The tailings from the central concentrator are pumped directly to the tailings dams, as they are predominantly Merensky Reef tailings. Some of the tailings generated by the UG2 PGM recovery plant is reprocessed at two metallurgical plants to recover the chromite. Impala has an off-take agreement with Merafe Resources and annually sells approximately 220kt of chromite concentrate recovered at one of the chromite recovery plants. The second chromite recovery plant, which is owned by Impala Chrome, was commissioned in 2010 and is operated by Chrome Traders (Pty) Ltd. Currently some 200kt of chromite is reprocessed per annum by Chrome Traders and the remainder is pumped to the tailings dams. The retrieved chromite from the UG2 tailings has an average Cr_2O_3 grade of approximately 41.5%. The number 3 and number 4 tailings dams at Impala currently contain some 500Mt of milled and processed ore, with an average Cr_2O_3 grade of less than 8%.

At the **Marula Mine**, ore from the UG2 Reef is milled and processed to retrieve the PGMs at the PGM recovery plant of the mine. The Makgomo chrome recovery plant subsequently reprocesses the UG2 tailings generated by the PGM recovery plant to extract the chromitite. The plant has been operating since 2010. Owned by Makgomo Chrome (Pty) Ltd, the plant is operated by Chrome Traders that has an off-take agreement whereby all of the chromite concentrate produced is purchased on a free carrier basis from the plant. Makgomo Chrome is 50% owned by the Marula Community Chrome (Pty) Ltd, 30% by Implats and 20% by Marula Platinum Mine. In recent years some 150kt of chromite concentrate is produced per annum and the remainder is pumped to the tailings dams. The *in situ* grade of the UG2 chromitite layer at Marula has not been determined, but the chromite concentrate has an average Cr_2O_3 grade of approximately 42%. The tailings dam at Marula currently contains some 15.7 million tonnes of milled and processed UG2 ore at an average Cr_2O_3 grade of approximately 12%.

At the **Two Rivers Platinum Mine**, ore from the UG2 Reef is milled and processed to recover the PGMs at the mine's MF2 PGM concentrator. The chromite recovery plant then reprocesses the UG2 tailings generated by the concentrator to recover the chromite. The chromite recovery plant was commissioned in 2013 and is owned and operated by Two Rivers, which also has an off-take agreement with Chrome Traders whereby all of the concentrate produced is purchased on a free carrier basis from Two Rivers. Currently some 240kt per annum of chromite is produced at a Cr_2O_3 grade of 41.5% and a silica content of less than 3%, with the remainder being pumped to the tailings dams. The UG2 tailings at Two Rivers that have been reprocessed at an average Cr_2O_3 grade of 15%. The tailings dams at Two Rivers currently contain some 24 million tonnes of milled and processed ore, at an average Cr_2O_3 grade of 17%.

No mining has taken place at **Afplats**. The UG2 Reef in this area has an average *in situ* Cr_2O_3 grade of about 31%.

At **Zimplats**, the uppermost chromitite layer (Seam 1) occurs 220m below the MSZ. It can therefore not be mined from the existing infrastructure and is mined by other operators and artisanal miners close to the surface outcrop for its chromium content only. This is also the case at **Mimosa**.

The available information is currently not sufficient to support a comprehensive Mineral Resource or Mineral Reserve Statement for the chromium ore production by Implats.

Areas excluded from Mineral Resource estimates

IMPLATS INTRODUCED A DEPTH CUT-OFF IN 2010 WHEREBY MINERALISATION BELOW A CERTAIN DEPTH IS EXCLUDED FROM THE MINERAL RESOURCE ESTIMATE.

This depth cut-off is applicable to the Bushveld Complex setting and is reviewed annually considering a range of assumptions, specifically the virgin rock temperature (VRT), cooling requirements, available technology, support design and other cost, prices and mining depth limits presently in the platinum industry. It is recognised that while the actual depth cut-off could vary from area to area and over time as conditions vary, a constant depth is assumed for all operations at present. The depth cut-off of 2 350m was applied during the 2013 Implats Mineral Resource estimates and equated approximately to a VRT of 73°C. The depth cut-off was effectively set at 2 000m below surface in 2014. Additional to the depth cut-off areas, various Mineral Resource blocks are considered on a case-by-case basis. Effectively all mineralisation deeper than 2 000m below surface has now been excluded from the Mineral Resource Statements, as well as other areas where the eventual economic extraction is in doubt.

In order to avoid confusion, these areas are not reported with the Mineral Resources but separately in this section. For further clarity, note that these are excluded from the summation of total Mineral Resources per area and the attributable Mineral Resources. These areas are also indicated as excluded areas on the Mineral Resource maps per operation.

The indicative quantum of such excluded areas is as follows:

- At Impala the estimate for the areas underlain by the Merensky and UG2 Reefs that are excluded in the Mineral Resource estimates is in the order of some 19.5Moz Pt. More than 60% of these areas occur at depths greater than 2 350m below surface
- At Afplats all of the Merensky Reef is excluded from the Mineral Resource estimates given the unlikely eventual economic extraction. In addition, there are areas where the UG2 Reef occurs at depths deeper than 2 000m and these are excluded in the Mineral Resource estimates listed in the Afplats section. The indicative quantum of such excluded areas is in the order of some 16Moz Pt for the UG2 Reef and Merensky Reef
- At Two Rivers, an area west of the major fault on the farms Kalkfontein and Buffelshoek is excluded from the Mineral Resource estimate. The indicative quantum of such excluded areas is in the order of some 9Moz Pt in total for the Merensky and UG2 Reefs
- At Zimplats, areas which are excluded from the Mineral Resource estimates are indicated on the Mineral Resource maps. These are mostly low grade areas and the quantum of these is not material in comparison with the total estimate for Zimplats.

Underground borehole core, 11C Shaft, Impala

Glossary of terms

4E (equivalent to 3PGE+Au)	Refers to the sum of platinum, palladium, rhodium and gold content as determined by a nickel sulphide collection fire assay procedure; this is considered to be the most accurate assay procedure, and results can usually be compared between laboratories.
6E (equivalent to 5PGE+Au)	Refers to the sum of platinum, palladium, rhodium, ruthenium, iridium and gold content as determined by a nickel sulphide collection fire assay procedure; this is considered to be the most accurate assay procedure, and results can usually be compared between laboratories.
AA	Atomic absorption spectroscopy is an analytical technique which uses the absorption of light to measure the concentration of elements.
Afplats	Afplats (Pty) Ltd.
Anorthosite	Igneous rock composed almost entirely of plagioclase feldspar.
ARM	African Rainbow Minerals Limited of which ARM Platinum is a subsidiary.
ASX	Australian Securities Exchange.
AusIMM	Australasian Institute of Mining and Metallurgy.
BEE	Black economic empowerment.
Bord and pillar	Underground mining method where ore is extracted from rectangular shaped rooms, leaving parts of the ore as pillars to support the roof. Pillars are usually rectangular and arranged in a regular pattern.
Bronzitite	Igneous rock composed mainly of orthopyroxene.
Concentrating	A process of splitting the milled ore in two fractions, the smaller fraction containing the valuable minerals, the rest waste.
Chromitite	A rock composed mainly of the mineral chromite.
CIMA	Chartered Institute of Management Accountants.
Decline	A shallow dipping mining excavation used to access the orebody.
Development	Underground excavations for the purpose of accessing Mineral Reserves.
DMR	Department of Mineral Resources, formerly known as the Department of Minerals and Energy (DME).
Diorite	Igneous rock composed of amphibole, plagioclase feldspar, pyroxene and small amounts of quartz.
Dunite	Igneous rock consisting mainly of olivine.
Dyke	A wall-like body of igneous rock that intruded (usually vertically) into the surrounding rock in such a way that it cuts across the stratification (layering) of this rock.
ECSA	Engineering Council of South Africa: The Engineering Profession Act, 2000 (Act No 46 of 2000), was promulgated in 2000; the Act became effective in 2011. In terms of Section 18(1), the Act empowers ECSA to register persons in certain prescribed Categories of Registration. Paragraph 9 of the SAMREC Code refers to ECSA: A 'Competent Person' is a person who is registered with SACNASP, ECSA or SAGC, or is a Member or Fellow of the SAIMM, the GSSA or a Recognised Overseas Professional Organisation (ROPO).
EPO	Exclusive prospecting order (Zimbabwe).
Felsic rock	An igneous rock composed mainly of a light-coloured mineral, like feldspar (or plagioclase) and usually quartz, which are more than 60% by volume.
Gabbro	Igneous rock composed mainly and approximately equally of plagioclase feldspar and clinopyroxene.
g/t	Grams per metric tonne. The unit of measurement of metal content or grade, equivalent to parts per million.
GSSA	Geological Society of South Africa.
ha	Abbreviation for hectare, unit of area measured equal to 10 000 square metres.

Glossary of terms

Harzburgite	Igneous rock composed mainly of olivine and pyroxene.
ICP-MS	Inductively coupled plasma mass spectrometry is a type of mass spectrometry which is capable of detecting metals at low levels. This is achieved by ionizing the sample with inductively coupled plasma and then using a mass spectrometer to separate and quantify those ions.
IMSSA	Institute of Mine Surveyors of Southern Africa.
In situ	In its natural position or place.
JORC Code	The 2004 Australasian Code for Reporting of Mineral Resources and Ore Reserves. This was updated and reissued as the JORC Code 2012.
JSE	JSE Limited, the South African securities exchange based in Johannesburg. Formerly the JSE Securities Exchange and prior to that the Johannesburg Stock Exchange.
JV	Joint venture.
Kriging	A geostatistical estimation method that gives the best unbiased linear estimates of point values or of block averages.
LoM	Life-of-mine.
Mafic	An igneous rock composed mainly of dark ferromagnesium minerals, which are less than 90% by volume.
Merensky Reef	A horizon in the Critical Zone of the Bushveld Complex often containing economic grades of PGM and associated base metals. The 'Merensky Reef', as it is generally used, refers to that part of the Merensky unit that is economically exploitable, regardless of the rock type.
Mill grade	The value, usually expressed in parts per million or gram per tonne, of the contained material delivered to the mill.
Moz	Million ounces. All references to ounces are troy ounces with the factor being 31.10348 metric grams per ounce.
MPRDA	Minerals and Petroleum Resources Development Act of South Africa.
MSZ	The Main Sulphide Zone (MSZ) is the PGM-bearing horizon hosted by the Great Dyke. In addition to the economically exploitable PGMs there is associated base metal mineralisation. The MSZ is located 10m to 50m below the ultramafic/mafic contact in the P1 pyroxenite.
Mt	Abbreviation for million metric tonnes.
Norite	Igneous rock composed mainly of plagioclase feldspar and orthopyroxenes in approximately equal proportions.
Pegmatoid	An igneous rock that has the coarse-crystalline texture of a pegmatite but lacks graphic intergrowths.
PGE	Platinum group elements comprising the six elemental metals of the platinum group. The metals are platinum, palladium, rhodium, ruthenium, iridium and osmium.
PGM	Platinum group metals being the metals derived from PGE.
Pyroxenite	Igneous rock composed mainly of pyroxene and minor feldspar.
QAQC	Quality Assurance and Quality Control.
RBR	Royal Bafokeng Resources.
Reef	A local term for a tabular metalliferous mineral deposit.

Glossary of terms

RPO	Recognised Professional Organisation.
SACNASP	South African Council for Natural Scientific Professions: The Natural Sciences Profession Act, 2003 (Act No 27 of 2003), was approved in 2003. The Act empowers SACNASP to register persons in certain prescribed categories of registration. Paragraph 9 of the SAMREC Code refers to SACNASP: A 'Competent Person' is a person who is registered with SACNASP, ECSA or SAGC, or is a Member or Fellow of the SAIMM, the GSSA or a Recognised Overseas Professional Organisation (ROPO).
SAICA	South African Institute of Chartered Accountants.
SAGC	South African Geomatics Council.
SAIMM	Southern African Institute of Mining and Metallurgy.
SAMREC	The South African Mineral Resource Committee.
SAMREC Code	The South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves.
SAMVAL Code	The South African Code for the reporting of Mineral Asset Valuation.
Section 11	Section 11 of the MPRDA provides that the Minister's written consent is required for the cession, transfer or sale of a right, or an interest in such right, as well as the sale of a controlling interest in an unlisted company or close corporation.
Section 52	Section 52 of the MPRDA provides that the holder of a mining right must, after consultation with applicable trade unions, inform the Minerals and Mining Development Board if any mining operation are to be curtailed or to cease with the likely consequence being that 10% or more of the workforce or more than 500 employees, are likely to be retrenched in any 12-month period.
Section 102	Section 102 of the MPRDA provides that a right may not be amended or varied without the written consent of the Minister. This includes the mining work programme, environmental management programme, extension of the area or addition of minerals or seams.
Seismic surveys	A geophysical exploration method whereby rock layers can be mapped based on the time taken for wave energy reflected from these layers to return to surface.
Smelting	A pyrometallurgical process to further upgrade the fraction containing valuable minerals.
SSC	SAMREC/SAMVAL Committee.
Stoping	Underground excavations to effect the removal of ore.
UG2 Reef	A distinct chromitite horizon in the Upper Critical Zone of the Bushveld Complex usually containing economic grades of PGE and limited associated base metals.
Ultramafic rock	An igneous rock composed mainly of dark ferromagnesium minerals, which are more than 90% by volume.
Websterite	Igneous rock composed almost entirely of clino- and orthopyroxene.

Mineral Resource and Mineral Reserve definitions

SAMREC Code – The Code sets out a required minimum standard for the Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves. References in the Code to Public Report or Public Reporting pertain to those reports detailing exploration results, Mineral Resources and Mineral Reserves and which are prepared as information for investors or potential investors and their advisers. SAMREC was established in 1998 and is modelled on the Australasian Code for reporting of Mineral Resources and Ore Reserves (JORC Code). The first version of the SAMREC Code was issued in March 2000 and adopted by the JSE in its Listings Requirements later that same year. The Code has been adopted by the SAIMM, GSSA, SACNASP, ECSA, IMSSA and SAGC, and it is binding on members of these organisations. For background information and the history of the development of the Code, please refer to the SAMREC Code, March 2000. A second edition of the SAMREC Code was issued in 2007 with an amendment being issued in 2009 and the latest edition was released in May 2016, this supersedes the previous editions of the Code.

A **'Competent Person'** (CP) is a person who is registered with SACNASP, ECSA or SAGC, or is a Member or Fellow of the SAIMM, the GSSA, IMSSA or a Recognised Professional Organisation (RPO). These organisations have enforceable disciplinary processes including the powers to suspend or expel a member. A complete list of recognised organisations will be promulgated by the SAMREC/SAMVAL Committee (SSC) from time to time. The Competent Person must comply with the provisions of the relevant promulgated Acts. A Competent Person must have a minimum of five years' relevant experience in the style of mineralisation or type of deposit under consideration and in the activity which that person is undertaking. If the Competent Person is estimating or supervising the estimation of Mineral Resources, the relevant experience must be in the estimation, assessment and evaluation of Mineral Resources. If the Competent Person is estimating, or supervising the estimation of Mineral Reserves, the relevant experience must be in the estimation, assessment, evaluation and assessment of the economic extraction of Mineral Reserves. Persons being called upon to sign as a Competent Person must be clearly satisfied in their own minds that they are able to face their peers and demonstrate competence in the commodity, type of deposit and situation under consideration.

A **'Mineral Resource'** is a concentration or occurrence of solid material of economic interest in or on the earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling. Mineral Resources are subdivided, and must be so reported, in order of increasing confidence in respect of geoscientific evidence, into Inferred, Indicated or Measured categories. Geological evidence and knowledge required for the estimation of Mineral Resources must include sampling data of a type, and at spacings, appropriate to the geological, chemical, physical, and mineralogical complexity of the mineral occurrence, for all classifications of Inferred, Indicated and Measured Mineral Resources.

An **'Inferred Mineral Resource'** is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity. An Inferred Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

An **'Indicated Mineral Resource'** is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation. An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource and may only be converted to a Probable Mineral Reserve. An Indicated Mineral Resource has a higher level of confidence than that applying to an Inferred Mineral Resource.

Mineral Resource and Mineral Reserve definitions

A **'Measured Mineral Resource'** is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit. Geological evidence is derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade or quality continuity between points of observation. A Measured Mineral Resource has a higher level of confidence than that applying to either an Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a Proved Mineral Reserve or to a Probable Mineral Reserve.

A **'Mineral Reserve'** is the economically mineable part of a Measured and/or Indicated Mineral Resource. It includes diluting materials and allowances for losses, which may occur when the material is mined or extracted and is defined by studies at pre-feasibility or feasibility level as appropriate that include application of Modifying Factors. Such studies demonstrate that, at the time of reporting, extraction could reasonably be justified. The reference point at which Mineral Reserves are defined, usually the point where the ore is delivered to the processing plant, must be stated. It is important that, in all situations where the reference point is different, such as for a saleable product, a clarifying statement is included to ensure that the reader is fully informed as to what is being reported.

A **'Probable Mineral Reserve'** is the economically mineable part of an Indicated, and in some circumstances, a Measured Mineral Resource. The confidence in the Modifying Factors applying to a Probable Mineral Reserve is lower than that applying to a Proved Mineral Reserve.

A **'Proved Mineral Reserve'** is the economically mineable part of a Measured Mineral Resource. A Proved Mineral Reserve implies a high degree of confidence in the Modifying Factors.

'SAMVAL Code' – The South African Code for the reporting of Mineral Asset Valuation (the SAMVAL Code or 'the Code') sets out minimum standards and guidelines for Reporting of Mineral Asset Valuation in South Africa. The process for establishing the SAMVAL Code was initiated through an open meeting at a colloquium convened by the Southern African Institute of Mining and Minerals (SAIMM) in March 2002. The first edition of the SAMVAL Code was released in April 2008, with further amendments in July 2009. After various discussions it became apparent that a review process was required, and this was initiated in September 2011 at an open meeting at which participants were invited to express their opinions on matters that were unclear, or that required inclusion/exclusion or modification, in the 2008 edition and this resulted in the recent update released in May 2016.

A **'Competent Valuator'** (CV) is a person who is registered with ECSA, SACNASP, or SAGC, or is a Member or Fellow of the SAIMM, the GSSA, SAICA, or a Recognised Professional Organisation (RPO) or other organisations recognised by the SSC on behalf of the JSE Limited. A Competent Valuator is a person who possesses the necessary qualifications, ability, and relevant experience in valuing mineral assets. A person called upon to sign as a Competent Valuator shall be clearly satisfied in their own mind that they are able to face their peers and demonstrate competence in the valuation undertaken.

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