

ANGLOGOLD ASHANTI LTD

Form 6-K

April 05, 2019

**UNITED STATES**

**SECURITIES AND EXCHANGE COMMISSION**

**WASHINGTON, DC 20549**

**FORM 6-K**

**REPORT OF FOREIGN PRIVATE ISSUER**

**PURSUANT TO RULE 13a-16 OR 15d-16 OF**

**THE SECURITIES EXCHANGE ACT OF 1934**

Report on Form 6-K dated March 29, 2019

Commission File Number 1-14846

AngloGold Ashanti Limited

(Name of registrant)

76 Rahima Moosa Street

Newtown, 2001

(P.O. Box 62117, Marshalltown, 2107)

South Africa

(Address of principal executive offices)

Indicate by check mark whether the registrant files or will file annual reports under cover of Form 20-F or Form 40-F.

**Form 20-F X**

Form 40-F

Indicate by check mark if the registrant is submitting the Form 6-K in paper as permitted by Regulation S-T Rule 101(b)(1):

Yes

**No X**

Indicate by check mark if the registrant is submitting the Form 6-K in paper as permitted by Regulation S-T Rule 101(b)(7):

Yes

**No X**

Indicate by check mark whether the registrant by furnishing the information contained in this Form is also thereby furnishing the information to the Commission pursuant to Rule 12g3-2(b) under the Securities Exchange Act of 1934.

Yes

**No X**

**Enclosure: Press release ANGLOGOLD ASHANTI LIMITED – MINERAL RESOURCE AND ORE RESERVE REPORT FOR THE YEAR ENDED DECEMBER 31, 2018**

SUITE OF REPORTS

<IR>

<SDR>

<NOM>

<R&R>

<AFS>

MINERAL RESOURCE

AND ORE RESERVE

REPORT

2018

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AngloGold Ashanti publishes a suite of reports annually to record our overall performance. While the Integrated Report 2018 is our primary report, it should be read in conjunction with this report, the Mineral Resource and Ore Reserve Report 2018, as well as the other reports making up our full suite of reports for the year.

This document provides shareholders with the information required to enable them to make informed decisions regarding the

resolutions to be voted on at the company's annual general meeting for shareholders. Details on these resolutions are also provided.

This document is distributed to all AngloGold Ashanti shareholders.

In compliance with the rules governing its listing on the New York Stock Exchange (NYSE), AngloGold Ashanti prepares a report on

Form 20-F which is led annually with the United States Securities and Exchange Commission (SEC).

As this Notice of Annual General Meeting does not provide a holistic assessment of the group's business, performance, risks or

prospects, it should be read in conjunction with other reports making up AngloGold Ashanti's 2018 annual reports.

These are:

<IR>

Integrated Report

•

The primary document in our suite of reports

•

Provides a comprehensive

overview of our  
performance  
in relation to  
our strategic  
objectives and the  
outlook for the  
company

- 

Both financial  
and non-financial  
performance are  
reviewed

- 

Complies with the  
IIRC framework,  
King IV and  
the JSE and  
NYSE listings  
requirements

<NOM>

Notice of Annual  
General Meeting  
and Summarised  
Financial  
Information (Notice  
of Meeting)

- 

Notice of  
forthcoming  
annual general  
meeting

- 

Description of  
resolutions to be  
voted on

- 

Remuneration  
policy and  
implementation  
report

- 

Summarised  
financial  
information

<SDR>

Sustainable  
Development  
Report

- 

Describes  
commitment

to sustainable  
development

•

Provides detail on  
socio-economic  
and environmental  
performance in  
relation to material  
issues

•

Complies with  
GRI Standards  
and is aligned with  
the UN Global  
Compact and  
UN Sustainable  
Development  
Goals (SDGs)

•

Independently  
assured  
<R&R>  
Mineral Resource  
and Ore Reserve  
Report

•

Detailed  
breakdown of our  
Mineral Resource  
and Ore Reserve  
– at group and  
operational level

•

Complies with  
SAMREC and  
JORC, as well as  
Section 12.11 of  
the JSE Listings  
Requirements

•

Signed off by  
Competent  
Person  
<AFS>  
Annual Financial  
Statements

•

Prepared in  
accordance with  
the International  
Financial

Reporting  
Standards  
(IFRS); the  
requirements of  
the South African  
Companies Act,  
no 71 of 2008,  
as amended;  
the JSE Listings  
Requirements and  
King IV

•

Audited in  
accordance with  
International  
Standards on  
Auditing

•

Includes the  
Directors' report  
<WWW>

Our dedicated annual  
reporting website,  
hosts PDFs of the  
full suite of reports  
to facilitate ease  
of access by and  
communication with  
stakeholders.

Scan to visit the  
mobile website  
[www.aga-reports.com](http://www.aga-reports.com)

Houses the full suite  
of 2018 reports  
together with  
supplementary  
information

All these reports are available online at [www.aga-reports.com](http://www.aga-reports.com)

Printed copies of these reports are available on request from the company

SECTION 1 / INTRODUCTION

## ABOUT THIS REPORT

The Mineral Resource and Ore Reserve for AngloGold Ashanti Limited (AngloGold Ashanti) are reported in accordance with the minimum standards prescribed by the South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (the SAMREC Code, 2016 edition), and also conform to the standards set out in the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012 edition).

The reporting criteria, as outlined in the reporting codes, have been used in the preparation of internal Competent Person reports

(CPR) for each operation, from which the numbers stated in this report have been drawn. Reporting is also in accordance with

Section 12 of the Johannesburg Stock Exchange (JSE) Listings Requirements.

The Mineral Resource, as reported, is inclusive of the Ore Reserve component unless otherwise stated. Mineral Resource and

Ore Reserve are reported as at 31 December 2018, net of 2018 production depletion.

Information is presented by operating region, country, mine and project. The following tables and graphs are used to illustrate details

across AngloGold Ashanti's operations during 2018: infrastructure maps; legal aspects and tenure, inclusive Mineral Resource and

Ore Reserve comparison by region, country, mine and project, details of average drill hole/sampling spacing and type, geological

cross sections and Mineral Resource sensitivities, exclusive Mineral Resource, Mineral Resource below infrastructure, inclusive

Mineral Resource and Ore Reserve by-products, year-on-year reconciliation of the Mineral Resource and Ore Reserve, Inferred

Mineral Resource in business plan, Ore Reserve modifying factors, grade tonnage information on the Mineral Resource and details

of appointed Competent Persons. Topics for brief discussion include regional overview, country overview, introduction, geology,

exploration, projects and estimation.

### PLEASE NOTE:

The following should be noted in respect of our report:

- All figures are expressed on an attributable basis unless otherwise indicated

- Unless otherwise stated, \$ or dollar refers to US dollars throughout

- Locations on maps are indicative

- Group and company are used interchangeably

- Mine, operation and business unit are used interchangeably

- Rounding off of numbers may result in computational discrepancies

- To reflect that figures are not precise calculations and that there is uncertainty in their estimation, AngloGold Ashanti reports

tonnage, content for gold, silver and uranium to two decimals and copper, sulphur and molybdenum content with no decimals

- Metric tonnes are used throughout this report

-

For terminology used in this report, please refer to the glossary of terms on page 257

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All grade tonnage curves reflect the Mineral Resource and exclude stockpiles unless otherwise stated

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SECTION 1 / INTRODUCTION

GROUP PROFILE

LOCATION OF ANGLOGOLD ASHANTI'S  
OPERATIONS AND PROJECTS

Our operations and projects are grouped regionally as follows:

SOUTH AFRICA

CONTINENTAL AFRICA

Democratic Republic of the Congo, Ghana, Guinea, Mali and Tanzania

AUSTRALASIA

Australia

AMERICAS

Argentina, Brazil, Colombia

Percentages indicate the ownership interest held by AngloGold Ashanti.

All operations are 100%-owned unless otherwise indicated.

Project

Operation

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SECTION 1 / INTRODUCTION

## CORPORATE GOVERNANCE

AngloGold Ashanti reports its Mineral Resource and Ore Reserve in accordance with the minimum standards prescribed by the South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (the SAMREC Code, 2016 edition), and also conform to the standards set out in the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012 edition).

AngloGold Ashanti achieves this through ensuring the principles of integrity, transparency and materiality are central to the

compilation of this report and through using the reporting criteria and definitions as detailed in the SAMREC code. In complying with

revisions to the SAMREC Code, the changes to AngloGold Ashanti's Mineral Resource and Ore Reserve have been reviewed and

it was concluded that none of the changes are material to the overall valuation of the company. AngloGold Ashanti has therefore

once again resolved not to provide the detailed reporting as defined in Table 1 of the code, apart from the maiden Ore Reserve

declaration for Quebradona. The company will however continue to provide the high level of detail it has in previous years in order to

comply with the transparency requirements of the code.

AngloGold Ashanti established a Mineral Resource and Ore Reserve Steering Committee (RRSC), which is responsible for setting

and overseeing the company's Mineral Resource and Ore Reserve governance framework and for ensuring that it meets the

company's goals and objectives while complying with all relevant regulatory codes. Its membership and terms of references are

mandated under a policy document signed by the Chief Executive Officer.

For more than a decade, the company has developed and implemented a rigorous system of internal and external reviews aimed

at providing assurance in respect of Ore Reserve and Mineral Resource estimates. The following operations were subject to an

external review in line with the policy that each operation/project will be reviewed by an independent third party on average once

every three years:

- Mineral Resource and Ore Reserve at Iduapriem
- Mineral Resource and Ore Reserve at Sunrise Dam
- Mineral Resource and Ore Reserve at Cerro Vanguardia
- Mineral Resource and Ore Reserve at Serra Grande
- Mineral Resource and Ore Reserve at Quebradona

The external reviews were conducted by Pivot Mining Consultants Pty (Limited), AMC Consultants Pty Limited, Golder Associates

Pty Limited, Ausenco Engineering Canada Inc. and Optiro Pty Limited respectively. Certificates of sign-off have been received from

the companies conducting the external reviews to state that the Mineral Resource and/or Ore Reserve comply with the SAMREC

and JORC Codes.

In addition, numerous internal Mineral Resource and Ore Reserve process reviews were completed by suitably qualified Competent Persons from within AngloGold Ashanti and no significant deficiencies were identified. The Mineral Resource and Ore Reserve are underpinned by appropriate Mineral Resource management processes and protocols that ensure adequate corporate governance. These procedures have been developed to be compliant with the guiding principles of the Sarbanes-Oxley Act of 2002. AngloGold Ashanti makes use of a web-based group reporting database called the Resource and Reserve Reporting System (RCubed) for the compilation and authorisation of Mineral Resource and Ore Reserve reporting. It is a fully integrated system for the reporting and reconciliation of Mineral Resource and Ore Reserve that supports various regulatory reporting requirements including the SEC and the JSE under SAMREC. AngloGold Ashanti uses RCubed to ensure a documented chain of responsibility exists from the Competent Persons at the operations to the company's RRSC. AngloGold Ashanti has also developed an enterprise-wide risk management tool that provides consistent and reliable data that allows for visibility of risks and actions across the group. This tool is used to facilitate, control and monitor material risks to the Mineral Resource and Ore Reserve, thus ensuring that the appropriate risk management and mitigation plans are in place.

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SECTION 1 / INTRODUCTION

## COMPETENT PERSONS

The information in this report relating to exploration results, Mineral Resource and Ore Reserve, is based on information compiled by or under the supervision of the Competent Persons as defined in the SAMREC or JORC Codes. All Competent Persons are employed by AngloGold Ashanti, except for Kibali and Morila, and have sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which they are undertaking. The legal tenure of each operation and project has been verified to the satisfaction of the accountable Competent Person and all their Ore Reserve have been confirmed to be covered by the required mining permits or there exists a realistic expectation that these permits will be issued. This information is detailed within this report. The Competent Persons consent to the inclusion of Exploration Results, Mineral Resource and Ore Reserve information in this report, in the form and context in which it appears. Accordingly, the Chairman of the RRSC, VA Chamberlain, MSc (Mining Engineering), BSc (Hons) (Geology), MGSSA, FAusIMM, assumes responsibility for the Mineral Resource and Ore Reserve processes for AngloGold Ashanti and is satisfied that the Competent Persons have fulfilled their responsibilities. VA Chamberlain has 31 years' experience in exploration and mining and is employed full-time by AngloGold Ashanti and can be contacted at the following address: 76 Rahima Moosa Street, Newtown, 2001, South Africa.  
Ghana – Obuasi

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SECTION 1 / INTRODUCTION

#### YEAR IN REVIEW

AngloGold Ashanti strives to actively create value by growing its major asset – the Mineral Resource and Ore Reserve. This drive is based on active, well-defined brownfields and greenfields exploration programmes, innovation in both geological modelling and mine planning and continual optimisation of the asset portfolio.

#### PRICE ASSUMPTIONS

The SAMREC code requires the use of reasonable economic assumptions. These include long-range commodity price and

exchange rate forecasts. These are reviewed annually and are prepared in-house using a range of techniques including historic

price averages.

The Mineral Resource sensitivities shown in the detail of this report use a base of \$1,400/oz and a range of \$200/oz, unless

otherwise stated.

Gold price

The following local prices of gold were used as the basis for estimation:

Gold price

US\$/oz

Local prices of gold

South Africa

ZAR/kg

Australia

AUD/oz

Brazil

BRL/oz

Argentina

ARS/oz

2018 Ore Reserve

1,100

501,150

1,509

3,565

45,443

2017 Ore Reserve

1,100

512,059

1,491

3,573

17,898

2018 Mineral Resource

1,400

563,331

1,778

4,501

51,564

2017 Mineral Resource

1,400

601,870

1,824

4,492

21,242

Copper price

The following copper prices were used as the basis for estimation:

Copper price

US\$/lb

2018 Ore Reserve

2.65

2018 Mineral Resource

3.30

2017 Mineral Resource

3.16

MINERAL RESOURCE

Gold

The AngloGold Ashanti Mineral Resource reduced from 208.2Moz in December 2017 to 184.5Moz in December 2018. This gross

annual decrease of 23.7Moz includes depletion of 4.0Moz and the disposal of assets of 20.1Moz. The balance of 0.4Moz results

from increases due to exploration and modelling of 4.5Moz and other factors of 0.1Moz and reductions due to revised geotechnical

design requirements of 4.0Moz and changes in cost of 0.2Moz. The Mineral Resource was estimated at a gold price of US\$1,400/oz

(2017: US\$1,400/oz).

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Year-on-year changes

Moz

Mineral Resource as at 31 December 2017

208.2

Disposals

Moab Khotsong

(16.2)

Kopanang

(3.0)

Vaal River Surface

(0.9)

Sub-total

188.1

Depletions

(4.0)

Sub-total

184.1

Additions

AGA Mineração

Increase due to exploration and modelling revisions

0.6

Kibali

Exploration success resulted in the increase in Mineral Resource

0.6

Cerro Vanguardia

The increase is due to a combination of reduced costs and revised estimation methodology

0.5

Other

Additions less than 0.5Moz

2.3

Sub-total

188.1

Reductions

Mponeng

The key reason for the reduction was the removal of the TauTona shaft pillars and increased costs. These reductions were countered in part by drilling success

(3.5)

Other

Reductions less than 0.5Moz

(0.1)

Mineral Resource as at 31 December 2018

184.5

Copper

The AngloGold Ashanti Mineral Resource reduced from 3.63Mt (8,000Mlbs) in December 2017 to 3.61Mt (7,954Mlbs) in December

2018. This gross annual decrease of 0.02Mt includes a reduction due to methodology of 0.09Mt offset by a change in ownership

of 0.05Mt and other factors which resulted in an increase of 0.02Mt. The Mineral Resource was estimated at a copper price of



US\$3.30/lb (2017: US\$3.16/lb).

Year-on-year changes

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YEAR IN REVIEW CONTINUED

Mt

Mlb

Mineral Resource as at 31 December 2017

3.63

8,000

Reductions

Quebradona

(0.02)

(46)

Mineral Resource as at 31 December 2018

3.61

7,954

ORE RESERVE

Gold

The AngloGold Ashanti Ore Reserve reduced from 49.5Moz in December 2017 to 44.1Moz in December 2018. This gross annual

decrease of 5.4Moz includes depletion of 3.6Moz. The loss after depletions of 1.8Moz, results from the disposal of assets in the

South African region of 6.1Moz, additions due to exploration and modelling changes of 4.3Moz, whilst other factors resulted in a

0.1Moz addition and changes in economic assumptions resulted in a 0.1Moz reduction. The Ore Reserve was estimated using a

gold price of US\$1,100/oz (2017: US\$1,100/oz).

Year-on-year changes

Moz

Ore Reserve as at 31 December 2017

49.5

Disposals

Moab Khotsong

(4.8)

Kopanang

(0.3)

Vaal River Surface

(0.9)

Sub-total

43.5

Depletions

(3.6)

Sub-total

39.9

Additions

Quebradona

Initial Ore Reserve publication post successful conclusion of the prefeasibility study

2.2

Geita

Additions are primarily due to exploration success on underground targets at Star and Comet and Nyankanga

0.5

CVSA

Reduced cost and exploration success led to the additions

0.4

Sunrise Dam

The increase is due to exploration success

0.3

Other

Additions less than 0.3Moz

1.1

Sub-total

44.4

Reductions

Other

Reductions less than 0.3Moz

(0.3)

Ore Reserve as at 31 December 2018

44.1

Copper

The maiden AngloGold Ashanti Ore Reserve for copper of 1.26Mt (2,769Mlbs) is based on exploration success and the completion

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SECTION 1 / INTRODUCTION

of the prefeasibility study (PFS) at Quebradona. The Ore Reserve was estimated at a copper price of US\$2.65/lb.

Year-on-year changes

Mt

Mlb

Ore Reserve as at 31 December 2017

0.00

0

Additions

Quebradona

Exploration success and completion of the PFS

1.26

2,769

Ore Reserve as at 31 December 2018

1.26

2,769

#### SALE OF ASSETS

AngloGold Ashanti sold various assets in the Vaal River region of its South African operations. The sales processes were finalised

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SECTION 1 / INTRODUCTION

YEAR IN REVIEW CONTINUED

on 28 February 2018. On conclusion of the sales and after depletions for that period of 2018, the final Mineral Resource and Ore

Reserve at the time of the sale are shown below:

Operation

Category

Moz

Kopanang

Mineral Resource

3.00

Ore Reserve

0.35

Moab Khotsong

Mineral Resource

16.20

Ore Reserve

4.83

Surface Operations

Mineral Resource

0.87

Ore Reserve

0.87

BY-PRODUCTS

Several by-products will be recovered as a result of processing of the gold Ore Reserve and copper Ore Reserve.

These include

0.37Mt of sulphur from Brazil, 32.68Moz of silver from Argentina and 23.58Moz of silver from Colombia.

Brazil – AGA Mineração – Cuiabá

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SECTION 1 / INTRODUCTION

Mineral Resource by country (attributable) inclusive of Ore Reserve: gold  
as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

South Africa

Measured

113.47

1.49

168.68

5.42

Indicated

614.07

1.91

1,170.36

37.63

Inferred

29.10

9.35

271.96

8.74

Total

756.64

2.13

1,611.00

51.79

Democratic Republic of the Congo

Measured

9.17

4.60

42.16

1.36

Indicated

44.71

3.05

136.37

4.38

Inferred

23.77

2.50

59.40

1.91

Total

77.65

3.06

237.93

7.65  
Ghana  
Measured  
6.84  
3.27  
22.35  
0.72  
Indicated  
184.26  
4.08  
750.93  
24.14  
Inferred  
77.77  
5.90  
458.67  
14.75  
Total  
268.87  
4.58  
1,231.95  
39.61  
Guinea  
Measured  
20.36  
0.63  
12.89  
0.41  
Indicated  
164.46  
0.87  
143.58  
4.62  
Inferred  
71.93  
0.93  
66.84  
2.15  
Total  
256.75  
0.87  
223.30  
7.18  
Mali  
Measured  
4.86  
0.54  
2.62  
0.08  
Indicated  
48.39

1.82  
88.27  
2.84  
Inferred  
7.23  
1.68  
12.19  
0.39  
Total  
60.48  
1.70  
103.07  
3.31  
Tanzania  
Measured  
0.94  
6.29  
5.92  
0.19  
Indicated  
28.11  
3.22  
90.57  
2.91  
Inferred  
21.81  
4.50  
98.20  
3.16  
Total  
50.86  
3.83  
194.69  
6.26  
Australia  
Measured  
59.03  
1.48  
87.32  
2.81  
Indicated  
90.51  
1.98  
179.38  
5.77  
Inferred  
29.79  
2.77  
82.52  
2.65  
Total



179.34  
1.95  
349.22  
11.23  
Argentina  
Measured  
9.37  
2.14  
20.00  
0.64  
Indicated  
20.95  
2.75  
57.53  
1.85  
Inferred  
4.61  
2.45  
11.31  
0.36  
Total  
34.93  
2.54  
88.85  
2.86  
Brazil  
Measured  
20.97  
6.45  
135.29  
4.35  
Indicated  
24.20  
5.83  
141.02  
4.53  
Inferred  
45.59  
5.86  
267.05  
8.59  
Total  
90.76  
5.99  
543.36  
17.47  
Colombia  
Measured  
—  
—  
—

—  
Indicated  
1,158.98  
0.77  
896.67  
28.83  
Inferred  
607.13  
0.43  
258.50  
8.31  
Total  
1,766.10  
0.65  
1,155.17  
37.14  
Total  
Measured  
245.01  
2.03  
497.23  
15.99  
Indicated  
2,378.65  
1.54  
3,654.68  
117.50  
Inferred  
918.73  
1.73  
1,586.64  
51.02  
Total  
3,542.39  
1.62  
5,738.55  
184.50

GROUP OVERVIEW

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GROUP OVERVIEW CONTINUED

Mineral Resource by country (attributable) exclusive of Ore Reserve: gold  
as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

South Africa

Measured

6.64

19.83

131.75

4.24

Indicated

30.97

17.42

539.39

17.34

Inferred

10.62

13.88

147.43

4.74

Total

48.24

16.97

818.56

26.32

Democratic Republic of the Congo

Measured

1.42

2.68

3.81

0.12

Indicated

22.68

2.43

55.11

1.77

Inferred

23.77

2.50

59.40

1.91

Total

47.87

2.47

118.32  
3.80  
Ghana  
Measured  
3.51  
5.57  
19.55  
0.63  
Indicated  
131.17  
3.95  
517.50  
16.64  
Inferred  
75.01  
6.09  
456.79  
14.69  
Total  
209.69  
4.74  
993.84  
31.95  
Guinea  
Measured  
—  
—  
—  
—  
Indicated  
97.67  
0.87  
85.03  
2.73  
Inferred  
71.93  
0.93  
66.84  
2.15  
Total  
169.60  
0.90  
151.87  
4.88  
Mali  
Measured  
—  
—  
—  
—  
Indicated

21.08  
1.72  
36.21  
1.16  
Inferred  
7.23  
1.68  
12.19  
0.39  
Total  
28.32  
1.71  
48.40  
1.56  
Tanzania  
Measured  
0.11  
9.89  
1.13  
0.04  
Indicated  
19.45  
2.77  
53.85  
1.73  
Inferred  
21.81  
4.50  
98.20  
3.16  
Total  
41.37  
3.70  
153.19  
4.93  
Australia  
Measured  
32.57  
1.65  
53.73  
1.73  
Indicated  
52.76  
1.78  
93.66  
3.01  
Inferred  
27.46  
2.70  
74.14  
2.38

Total  
112.78  
1.96  
221.53  
7.12  
Argentina  
Measured  
1.58  
1.27  
2.01  
0.06  
Indicated  
12.54  
3.34  
41.88  
1.35  
Inferred  
3.28  
2.97  
9.75  
0.31  
Total  
17.41  
3.08  
53.64  
1.72  
Brazil  
Measured  
15.71  
6.50  
102.11  
3.28  
Indicated  
13.87  
4.63  
64.25  
2.07  
Inferred  
44.14  
5.92  
261.47  
8.41  
Total  
73.73  
5.80  
427.82  
13.75  
Colombia  
Measured  
—  
—

—  
—  
Indicated  
991.22  
0.78  
772.88  
24.85  
Inferred  
607.13  
0.43  
258.50  
8.31  
Total  
1,598.34  
0.65  
1,031.38  
33.16  
Total  
Measured  
61.56  
5.10  
314.09  
10.10

Indicated  
1,393.41  
1.62  
2,259.75  
72.65

Inferred  
892.38  
1.62  
1,444.71  
46.45

Total  
2,347.35  
1.71  
4,018.55  
129.20  
12

SECTION 1 / INTRODUCTION

Mineral Resource by country (attributable) inclusive of Ore Reserve: copper  
as at 31 December 2018

Category

Tonnes  
million

Grade

%Cu

Contained copper

tonnes million pounds million

Colombia

Measured

–

–

–

–

Indicated

242.57

0.86

2.09

4,617

Inferred

325.40

0.47

1.51

3,337

Total

567.97

0.64

3.61

7,954

Total

Measured

–

–

–

–

Indicated

242.57

0.86

2.09

4,617

Inferred

325.40

0.47

1.51

3,337

Total

567.97

0.64

3.61

7,954



Mineral Resource by country (attributable) exclusive of Ore Reserve: copper  
as at 31 December 2018

Category

Tonnes

million

Grade

%Cu

Contained copper

tonnes million pounds million

Colombia

Measured

–

–

–

–

Indicated

138.52

0.61

0.84

1,848

Inferred

325.40

0.47

1.51

3,337

Total

463.92

0.51

2.35

5,185

Total

Measured

–

–

–

–

Indicated

138.52

0.61

0.84

1,848

Inferred

325.40

0.47

1.51

3,337

Total

463.92

0.51

2.35

5,185

Ghana – Iduapriem

13

SECTION 1 / INTRODUCTION

Ore Reserve by country (attributable): gold  
as at 31 December 2018

Category

Tonnes  
million

Grade

g/t

Contained gold

tonnes

Moz

South Africa

Proved

107.67

0.31

33.89

1.09

Probable

564.02

0.87

488.59

15.71

Total

671.70

0.78

522.47

16.80

Democratic Republic of the Congo

Proved

9.14

4.15

37.87

1.22

Probable

19.08

4.12

78.70

2.53

Total

28.22

4.13

116.57

3.75

Ghana

Proved

2.74

0.88

2.41

0.08

Probable

56.66

4.07

230.82

7.42

Total

59.40

3.93

233.23

7.50

Guinea

Proved

21.54

0.67

14.40

0.46

Probable

59.40

0.84

49.82

1.60

Total

80.94

0.79

64.22

2.06

Mali

Proved

2.50

0.65

1.62

0.05

Probable

26.27

1.94

50.86

1.64

Total

28.78

1.82

52.48

1.69

Tanzania

Proved

—

—

—

—

Probable

9.47

4.38

41.49

1.33

Total

9.47  
4.38  
41.49  
1.33  
Australia  
Proved  
26.43  
1.27  
33.50  
1.08  
Probable  
37.63  
2.27  
85.26  
2.74  
Total  
64.06  
1.85  
118.76  
3.82  
Argentina  
Proved  
7.72  
2.32  
17.88  
0.57  
Probable  
8.14  
1.89  
15.41  
0.50  
Total  
15.86  
2.10  
33.30  
1.07  
Brazil  
Proved  
3.52  
3.70  
13.01  
0.42  
Probable  
11.04  
4.71  
51.94  
1.67  
Total  
14.56  
4.46  
64.95

2.09  
 Colombia  
 Proved  
 –  
 –  
 –  
 Probable  
 167.76  
 0.74  
 123.79  
 3.98  
 Total  
 167.76  
 0.74  
 123.79  
 3.98  
 Total  
 Proved  
 181.26  
 0.85  
 154.60  
 4.97  
 Probable  
 959.49  
 1.27  
 1,216.69  
 39.12  
 Total  
 1,140.75  
 1.20  
 1,371.28  
 44.09  
 Ore Reserve by country (attributable): copper  
 as at 31 December 2018  
 Category  
 Tonnes  
 million  
 Grade  
 %Cu  
 Contained copper  
 tonnes million pounds million  
 Colombia  
 Proved  
 –  
 –  
 –  
 Probable  
 104.05  
 1.21

1.26  
2,769  
Total  
104.05

1.21  
1.26  
2,769  
Total  
Proved

—  
—  
—  
—

Probable  
104.05  
1.21  
1.26  
2,769  
Total  
104.05

1.21  
1.26  
2,769

GROUP OVERVIEW CONTINUED

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SECTION 1 / INTRODUCTION

Australia – Tropicana

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SECTION 1 / INTRODUCTION



GROUP OVERVIEW CONTINUED

Reconciliation of inclusive Mineral Resource (gold content Moz)

as at 31 December 2018

Previous  
year

Depletion

Explora-  
tion

Metho-  
dology

Gold  
price

Cost

Geo-  
technical

Metal-  
lurgical

Other

Acquisition/  
disposal

South Africa region

Kopanang

3.02

(0.02)

–

–

–

–

–

–

–

(3.01)

Moab Khotsong

16.30

(0.05)

–

–

–

–

–

–

–

(16.25)

Vaal River Surface

3.68

(0.19)

(0.00)

–

–

–

0.01

—  
0.18  
(0.87)  
Mine Waste Solutions  
2.24  
(0.07)  
—  
—  
—  
—  
—  
—  
0.00  
—  
West Wits Surface  
0.67  
(0.04)  
—  
—  
—  
—  
0.00  
—  
(0.01)  
—  
Mponeng  
49.97  
(0.32)  
0.49  
—  
—  
(0.43)  
(3.31)  
—  
(0.22)  
—  
Total  
75.89  
(0.69)  
0.49  
—  
—  
(0.43)  
( 3.29)  
—  
(0.05)  
(20.13)  
Continental Africa region  
Kibali  
7.44  
(0.36)

0.61  
(0.00)

—  
(0.01)

—  
(0.04)

—  
Iduapriem

5.54  
(0.36)  
0.04

—  
—  
0.34

—  
—  
(0.00)

—  
Obuasi  
34.05

—  
—  
—  
—  
—  
—  
—  
—  
—

Siguiri  
7.27  
(0.30)

0.06  
0.01  
—  
0.13

—  
0.02  
—  
—

Morila  
0.11  
(0.05)

0.03  
(0.01)  
—  
—

—  
—  
(0.00)

—  
Sadiola  
3.29  
(0.06)  
—  
—  
—  
—  
—  
—  
(0.00)  
—  
Geita  
6.42  
(0.61)  
0.22  
0.20  
—  
0.01  
—  
—  
0.02  
—  
Total  
64.13  
(1.75)  
0.96  
0.20  
—  
0.46  
—  
0.02  
(0.02)  
—  
Australasia region  
Sunrise Dam  
5.98  
(0.30)  
0.69  
0.39  
—  
(0.35)  
(0.58)  
—  
—  
—  
Tropicana  
5.22  
(0.33)  
0.91  
(0.04)

-  
(0.35)  
-  
-  
(0.02)  
-  
Total  
11.20  
(0.62)  
1.60  
0.35  
-  
(0.70)  
(0.58)  
-  
(0.02)  
-  
Americas region  
Cerro Vanguardia  
2.64  
(0.29)  
0.05  
0.15  
-  
0.36  
-  
-  
(0.07)  
-  
AGA Mineração  
13.57  
(0.52)  
(0.10)  
0.66  
-  
0.15  
(0.13)  
-  
-  
-  
Serra Grande  
3.66  
(0.15)  
0.16  
0.20  
-  
(0.05)  
-  
-  
0.01  
-



(4.00)  
 0.02  
 0.10  
 (20.04)  
 Reconciliation of inclusive Mineral Resource (copper content Mlb)  
 as at 31 December 2018  
 Previous  
 year  
 Depletion  
 Explora-  
 tion  
 Metho-  
 dology  
 Gold  
 price  
 Cost  
 Geo-  
 technical  
 Metal-  
 lurgical  
 Other  
 Acquisition/  
 Disposal  
 Americas region  
 Quebradona  
 8,000  
 -  
 -  
 (205)  
 -  
 -  
 -  
 -  
 42  
 117  
 Total  
 8,000  
 -  
 -  
 (205)  
 -  
 -  
 -  
 -  
 42  
 117  
 Grand total  
 8,000  
 -  
 -  
 (205)

-  
-  
-  
-

42

117

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SECTION 1 / INTRODUCTION



Current year	Net diff	%	Comments
—	(3.02)	(100)	Asset sold to Village Main Reef (VMR) in February 2018.
—	(16.30)	(100)	Asset sold to Harmony Gold in February 2018.
2.81	(0.87)	(24)	Changes are mainly due to the Harmony sale of Mispah 1 and 2 tailing storage facilities (TSFs) and Kopanang Paydam.
2.18	(0.07)	(3)	Annual depletions from Sulphur Paydam, East TSF and South East Extension.
0.62	(0.05)	(7)	Normal depletions from Harties 1 & 2 TSFs. Evaluation model grade adjustment for Harties 1 done on remainder of material.
46.18	(3.79)	(8)	Normal depletions from Mponeng and Savuka low grade stockpiles and Old North TSF.
51.79	(24.10)	(32)	The TauTona and Savuka shaft pillars have been removed as they will not be included in the LOM plan. Further reductions included depletions and an increase in the required mining grade based on the current cost of extraction.
7.65	0.21	3	Kibali was able to replace Mineral Resource ounces depleted as a result of the maiden reporting of the Kalimva and Ikamva open pit Inferred Mineral Resource, as well as exploration extensions in KCD underground.
5.56	0.02	0	Year-on-year changes include a decrease to the Mineral Resource as a result of depletion and increases as a result of exploration drilling and cost reductions.
34.05	—	—	

The Mineral Resource remains the same as 2017 as no mining took place in 2018.

7.18  
 (0.10)  
 (1)  
 Depletion was offset by gains due to reduced cost which brought back Eureka North, and exploration infill drilling at Foulata, Saraya and Silakoro and metallurgical improvements due to the introduction of the CIL option for Foulata and Saraya.

0.09  
 (0.02)  
 (22)  
 Depletions have been partially offset by the addition of Viper and Ntiola open pits from exploration.

3.23  
 (0.06)  
 (2)  
 Mainly due to mining depletions.

6.26  
 (0.16)  
 (3)  
 Depletion was offset by a gain largely from conversion of Inferred to Indicated Mineral Resource and exploration gain due to new drilling information for underground projects and a slight impact from lower cut-off grades in comparison to the previous year.

64.01  
 (0.12)  
 (0)  
 5.84  
 (0.14)  
 (2)  
 Exploration activities centred around the Vogue domain resulted in Mineral Resource additions. These were offset by Mineral Resource write-off of unmineable pillars and skins of historic stopes. Increases in year-on-year costs resulted in a further decrease.

5.39  
 0.17  
 3  
 Addition through exploration success at Boston Shaker underground offset by depletion. Havana South underground Mineral Resource adjusted in-line with updated Mineral Resource shell optimisation.

11.23  
 0.03  
 0  
 2.86  
 0.21  
 8  
 Year-on-year changes are due to depletion offset by positive changes due to methodology and costs.

13.63  
 0.06  
 0  
 The Lamego Mineral Resource increased mainly due to the update of cut-off with the new exchange rate and costs offset by depletion and methodology changes. The Cuiabá Mineral Resource increased mainly due to new sampling

information

and refining of the model to exclude internal waste offset by deletions. The CdS Mineral Resource reduced mainly due to

depletions, new information and an increase in costs for open pit mining offset by estimation methodology changes.

3.84

0.17

5

The depletion was replaced by exploration and revised methodology.

3.07

–

–

No change from 2017.

28.33

–

–

No material change from 2017.

5.74

0.08

1

Minor changes due to updated Mineable Shape Optimiser (MSO) analysis. Main changes to the Indicated/Inferred Mineral

Resource resulting from classification update using conditional simulation and kriging variance approach.

57.47

0.53

1

184.50

(23.66)

(11)

Current

year

Net diff

%

Comments

7,954

(46)

(1)

Minor changes due to updated MSO analysis. Main changes to the Indicated/Inferred Mineral Resource resulting from classification update using conditional simulation and kriging variance approach.

7,954

(46)

(1)

7,954

(46)

(1)

17

SECTION 1 / INTRODUCTION

GROUP OVERVIEW CONTINUED

Reconciliation of Ore Reserve (gold content Moz)

as at 31 December 2018

Previous  
year

Depletion

Explora-  
tion

Metho-  
dology

Gold  
price

Cost

Geo-  
technical

Metal-  
lurgical

Revenue

factor

Other

South Africa region

Kopanang

0.36

(0.01)

–

–

–

–

–

–

–

Moab Khotsong

4.87

(0.04)

–

–

–

–

–

–

–

Vaal River Surface

3.68

(0.17)

(0.00)

–

–

–

0.01

—  
—  
0.01  
Mine Waste Solutions  
2.24  
(0.08)  
0.01  
—  
—  
—  
—  
—  
—  
0.00  
West Wits Surface  
0.19  
(0.03)  
—  
0.16  
—  
—  
0.00  
(0.00)  
—  
(0.00)  
Mponeng  
12.16  
(0.27)  
0.26  
(0.02)  
—  
—  
(0.28)  
—  
—  
(0.20)  
Total  
23.51  
(0.60)  
0.27  
0.14  
—  
—  
(0.26)  
(0.00)  
—  
(0.19)  
Continental Africa region  
Kibali  
3.91  
(0.44)



(0.00)  
Sadiola  
1.70  
(0.05)  
—  
—  
—  
—  
—  
—  
(0.02)  
Geita  
1.25  
(0.44)  
0.45  
—  
—  
(0.00)  
—  
—  
0.02  
0.05  
Total  
16.89  
(1.54)  
0.71  
(0.00)  
—  
0.13  
0.01  
—  
0.02  
0.11  
Australasia region  
Sunrise Dam  
1.19  
(0.33)  
0.25  
—  
—  
0.04  
0.02  
—  
—  
0.03  
Tropicana  
2.85  
(0.31)  
0.22  
(0.00)

0.00  
(0.47)  
—  
0.00  
—  
0.31  
Total  
4.05  
(0.64)  
0.47  
(0.00)  
0.00  
(0.43)  
0.02  
0.00  
—  
0.34  
Americas region  
CVSA  
0.91  
(0.28)  
0.19  
0.19  
—  
0.12  
(0.06)  
—  
—  
—  
AGA Mineração  
2.06  
(0.40)  
(0.04)  
(0.01)  
0.00  
0.02  
0.04  
0.00  
—  
0.03  
Serra Grande  
0.33  
(0.14)  
—  
0.15  
(0.00)  
0.07  
0.01  
—  
(0.01)  
(0.02)



Gramalote

1.76

—

—

—

—

—

—

—

—

—

Quebradona

—

—

2.22

—

—

—

—

—

—

Total

5.06

(0.82)

2.37

0.33

0.00

0.21

(0.01)

0.00

(0.01)

0.01

Grand total

49.51

(3.60)

3.81

0.46

0.00

(0.08)

(0.24)

0.00

0.01

0.27

Reconciliation of Ore Reserve (copper content Mlb)

as at 31 December 2018

Previous

year

Depletion

Explora-

tion

Metho-  
dology  
Gold  
price  
Cost  
Geo-  
technical  
Metal-  
lurgical  
Revenue  
factor  
Other  
Americas region  
Quebradona

-  
-  
2,769

-  
-  
-  
-  
-  
-  
-

Total  
-  
-  
2,769

-  
-  
-  
-  
-  
-

Grand total  
-  
-  
2,769

-  
-  
-  
-  
-  
-

18  
SECTION 1 / INTRODUCTION

Acquisition/  
disposal  
Current  
year  
Net diff  
%

Comments

(0.35)

—

(0.36)

(100)

Asset sold to VMR mining company in February 2018.

(4.83)

—

(4.87)

(100)

Asset sold to Harmony Gold mining company in February 2018.

(0.87)

2.65

(1.03)

(28)

Significant portion sold to Harmony (Mispah 1 and Kopanang TSF as well as Moab Khotsong low grade stockpile). Normal depletion from tailings material as well as No. 5 low grade stockpile.

—

2.18

(0.07)

(3)

Normal depletions from tailings material through Mine Waste Solutions (MWS) plant.

—

0.33

0.13

69

Normal depletions from Mponeng and Savuka low grade stockpiles as well as Old North TSF.

—

11.65

(0.52)

(4)

Mponeng Ore Reserve decreased from the previous period mainly due to depletions and the removal of the TauTona shaft pillar Ore Reserve post the closure of the TauTona new technology project.

(6.06)

16.80

(6.71)

(29)

—

3.75

(0.16)

(4)

The Ore Reserve decreased year-on-year, mainly due to depletion, partially offset by exploration success in the underground and conversion drilling in the KCD open pit.

—

1.63

(0.22)

(12)

Minor cost improvements failed to replace dilution.

–

5.86

–

–

No mining or redesign occurred in 2018 as the mine remained on care and maintenance. The Ore Reserve figure remains as it was in 2017.

–

2.06

(0.18)

(8)

Positive model changes from infill drilling in Silakoro and Seguélen, decrease in costs mainly due to general and administration, increased slope angle in Bidini and Tubani (Sorofe) and changes in stockpile inventories failed to cover the depletion.

–

0.06

(0.02)

(26)

Depletions were partially offset by the addition of Viper and Ntiola open pits from exploration.

–

1.63

(0.07)

(4)

Mainly due to depletions and the exclusion of Tambali and FE3 pits.

–

1.33

0.08

7

Driven primarily by depletions offset by the introduction of Nyankanga Block 4 underground Ore Reserve.

–

16.33

(0.56)

(3)

–

1.20

0.01

1

The major change to the Ore Reserve was depletion, which was largely offset by additions in Vogue.

–

2.62

(0.24)

(8)

The majority of the Ore Reserve change for Tropicana gold mine is due to depletion. Other changes due to cost are balanced by exploration and the addition of Boston Shaker underground.

–

3.82

(0.23)

(6)

–

1.07

0.16

18

Exploration and changes to the estimation methodology more than replaced the depletion.

–

1.70

(0.36)

(17)

The Lamego Ore Reserve reduced mainly due to mining depletion offset by exploration success coming from the Carruagem and Queimada orebodies and costs. The Cuiabá Ore Reserve reduced mainly due to mining depletions. The CdS Ore Reserve reduced mainly due to depletions and the inclusion of transitional and sulphide material in the CdS Rosalino open pit as well as Mineral Resource conversions.

–

0.39

0.06

17

The main negative impacts were due to exchange ratio (lower gold price and higher cost). The main positive impacts were model change and scope change (geotechnical).

–

1.76

–

–

The Ore Reserve remains the same as 2017.

–

2.22

2.22

–

Maiden Ore Reserve declaration based on exploration success and the completion of the PFS.

–

7.14

2.08

41

(6.06)

44.09

(5.42)

(11)

Acquisition/

Disposal

Current

year

Net diff

%

Comments

–

2,769

2,769

100

Maiden Ore Reserve declaration based on exploration success and the completion of the PFS.

—

2,769

2,769

100

—

2,769

2,769

100

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21

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24

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Pretoria

LEGEND

1

West Wits operations

Includes Mponeng  
and West Wits Surface  
Operations

2

Vaal River operations

Includes MWS and  
Vaal River Surface  
Operations

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Regional overview

21

Mponeng

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South Africa – Mponeng

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SECTION 2 / SOUTH AFRICA

REGIONAL OVERVIEW

Key statistics

Units

2018

2017

2016

Operational performance

Tonnes treated/milled

Mt

34.9

38.9

39.6

Recovered grade

(1)

oz/t

0.219

0.202

0.219

g/t

6.82

6.93

7.51

Gold production

000oz

487

903

967

Total cash costs

\$/oz

1,033

1,085

896

Total production costs

\$/oz

1,187

1,247

1,089

All-in sustaining costs

(2)

\$/oz

1,178

1,245

1,081

Capital expenditure

\$m

73

150

182

(1)

Refers to underground operations only

(2)



Excludes stockpile write-offs

As at December 2018, AngloGold Ashanti's operations in South Africa had a total Mineral Resource (inclusive of the Ore Reserve) of 51.8Moz (2017: 75.9Moz) and an Ore Reserve of 16.8Moz (2017: 23.5Moz).

This is equivalent to 28% and 38% of the group's Mineral Resource and Ore Reserve respectively. The South African operations

produced 487koz of gold in 2018, or 14% of group production.

AngloGold Ashanti's South Africa operations comprise one deep level underground mine and three surface processing operations,

collectively referred to as Surface Operations.

The underground mine, Mponeng is 100% owned by AngloGold Ashanti. Mponeng is situated near the town of Carletonville and

is included as part of the West Wits operation. The primary reef being mined is the Ventersdorp Contact Reef (VCR).

The Carbon

Leader Reef (CLR) that was historically mined at the now closed TauTona mine, is planned to be mined in the Mponeng life of mine

(LOM) extension project. A sequential grid mining method is employed to extract the gold from the deep, narrow, tabular orebody.

The grid is pre-developed through a series of haulages and crosscuts. Stopping takes place by means of breast mining using

conventional hand held drill and blast techniques. The selective mining unit (SMU) is 100 x 100m.

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SECTION 2 / SOUTH AFRICA

REGIONAL OVERVIEW CONTINUED

The Surface Operations are located in both the Vaal River and West Wits Operations and include the Vaal River Surface, Mine Waste

Solutions (MWS) and the West Wits Surface processing operations. They rework the low grade stockpiles and retreat the TSFs

which resulted from the mining and processing of the primary and secondary reef horizons.

Sale of assets

AngloGold Ashanti sold various assets in the Vaal River region of its South African operations. The sales processes were finalised

on 28 February 2018. On conclusion of the sales and after depletions for that period of 2018, the final Mineral Resource and

Ore Reserve at the time of the sale are shown below:

Operation

Category

Moz

Kopanang

Mineral Resource

3.00

Ore Reserve

0.36

Moab Khotsong

Mineral Resource

16.20

Ore Reserve

4.87

Surface Operations

Mineral Resource

0.87

Ore Reserve

0.87

Inclusive Mineral Resource

as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

South Africa

Measured

113.47

1.49

168.68

5.42

Indicated

614.07

1.91

1,170.36

37.63

Inferred  
29.10  
9.35  
271.96  
8.74  
Total  
756.64  
2.13  
1,611.00  
51.79  
Exclusive Mineral Resource  
as at 31 December 2018

Category  
Tonnes  
million  
Grade  
g/t  
Contained gold

tonnes  
Moz  
South Africa

Measured  
6.64  
19.83  
131.75  
4.24

Indicated  
30.97  
17.42  
539.39  
17.34

Inferred  
10.62  
13.88  
147.43  
4.74

Total  
48.24  
16.97  
818.56  
26.32

Ore Reserve  
as at 31 December 2018

Category  
Tonnes  
million  
Grade  
g/t  
Contained gold

tonnes  
Moz

South Africa

Proved

107.67

0.31

33.89

1.09

Probable

564.02

0.87

488.59

15.71

Total

671.70

0.78

522.47

16.80

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SECTION 2 / SOUTH AFRICA

South Africa – Mine Waste Solutions

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SECTION 2 / SOUTH AFRICA

## MPONENG

### INTRODUCTION

#### Property description

Mponeng Mine is a deep level gold mine operating between 3,160m and 3,740m below mine datum (BMD) and is currently the deepest mine in the world with development at 3,841m BMD. Future mining is planned to deepen the shaft bottom to 4,227m BMD. All production is currently from VCR with future expansion planned on both VCR and the CLR horizons.

#### Location

The West Wits operations are a combination of Mponeng and the West Wits surface operations. Mponeng is situated to the south of the town of Carletonville and is approximately 65km west of Johannesburg.

#### History

Mponeng was previously known as the Western Deep Levels South Shaft, or No.1 Shaft. The original twin shaft sinking from surface commenced in 1981 and was commissioned along with the gold plant complex in 1986 when mining began. Production started through the use of two hoisting shafts, a sub-shaft and two service shafts. The name changed to Mponeng Mine in 1999. In 2017, Savuka and TauTona mines commenced orderly closure and the remaining TauTona Mineral Resource and Ore Reserve are published as part of Mponeng Mine.

#### Legal aspects and tenure

AngloGold Ashanti holds the following mining right in the Mponeng area which has been successfully converted, executed and registered as new order mining rights at the Mineral and Petroleum Resource Titles Office (MPRTO).

- GP30/5/1/2/2(01)MR valid from 14 February 2006 to 13 February 2036, covering 64.8km<sup>2</sup>

- GP30/5/1/2/2(11)MR valid from 11 July 2006 to 1 July 2016, covering 0.3km<sup>2</sup> (application for extension pending)

- GP30/5/1/2/2(248)MR valid from 16 October 2012 to 15 October 2022, covering 1.96km<sup>2</sup>  
A S102 application was submitted in March 2017 to consolidate the 3 licences into a single mining right (GP30/5/1/2/2(01)MR).

#### Mining method

For the exploitation of the ever deepening Mineral Resource and the need for exibility on a mine of this nature, the sequential grid mining method was adopted. This has been proven as the best method suited to safe deep level gold mining often associated with seismicity.

#### Operational infrastructure

Mponeng has its own processing plant situated adjacent to the mine. Ore and waste material is hoisted separately with ore being delivered to the plant by means of a conveyor belt and the waste rock going to the low grade stockpile.

#### Mineral processing

Ore mined is treated and smelted at the Mponeng gold plant, which also processes low grade ore from the stockpile adjacent to the shaft.

The ore is initially ground down by means of semi-autogenous milling after which a conventional gold leach process incorporating liquid oxygen injection is applied. The gold is then extracted by means of carbon-in-pulp (CIP) technology.

The plant conducts electro-winning and smelting (induction furnaces).

#### Risks

Upgrading of the Mineral Resource confidence of the deeper parts of Mponeng continues to be challenging. Surface exploration and underground exploration targets are slowly being completed but access to ground ahead of the mining front is often limited. New information, once obtained, does have the potential to affect the future of Mponeng Mine. Exploration drilling on the VCR at

depth is indicating that there might be an evolution of the current geological understanding. This will be further quantified and understood as exploration work continues.

Seismicity, which is associated with ultra deep level mining, remains the most significant risk to the execution of the mine plan. The risk is managed through ongoing seismic risk management, which then informs the mining strategy and execution schedule.

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SECTION 2 / SOUTH AFRICA

Map showing Mponeng Mine infrastructure and licences

Refer to the map showing Mponeng Mine infrastructure and licences on page 38.

VCR West Wits underground workings

Competent Persons

Responsibility

Competent Person

Professional

organisation

Membership

number

Relevant

experience

Qualification

Mineral Resource

Gareth Flitton

SACNASP

400019/15

15 years

BSc Hons (Geology), GDE

(Mineral Economics)

Ore Reserve

William Olivier

SAGC

MS 0136

28 years

GDE (Mining Engineering)

Measured Mineral Resource

Indicated Mineral Resource

Inferred Mineral Resource

Drill hole

Mining Rights area boundary

Development tunnels

Stoping

0

1,000

2,000

metres

25

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MPONENG CONTINUED

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SECTION 2 / SOUTH AFRICA

## GEOLOGY

### Deposit type

The VCR is the main reef horizon mined at Mponeng Mine. The VCR forms the base of the Ventersdorp Supergroup, which caps the Witwatersrand Supergroup through an angular unconformity. The overlying Ventersdorp Lavas halted the deposition of the VCR, preserving it in its current state.

The VCR consists of a quartz pebble conglomerate, which can be up to 3m thick in places. The footwall stratigraphy, following periods of uplift and erosion, controlled the development and preservation of the VCR, which is characterised by a series of channel

terraces preserved at different relative elevations, and the highest gold values are preserved in these channel deposits. The different channel terraces are divided by zones of thinner slope reef, which are of lower value and become more prevalent on the higher terraces and on the harder footwall units.

CLR West Wits underground workings

Measured Mineral Resource

Indicated Mineral Resource

Inferred Mineral Resource

Drill hole

Mining Rights area boundary

Development tunnels

Stoping

0

1,000

2,000

metres

27

SECTION 2 / SOUTH AFRICA

## MPONENG CONTINUED

The relatively argillaceous protoquartzites of the Kimberley Formation in the central portion of Mponeng are covered by the best preserved VCR conglomerates. The Elsburg Formation in the west is relatively more durable while the eastern side of the mine is dominated by shales and siltstones of the Booyens Formation. No VCR is preserved on the Krugersdorp Formation on the far eastern side of Mponeng.

The CLR is the other gold bearing reef reported as part of the total Mineral Resource for Mponeng. The CLR is located near the base of the Johannesburg Subgroup, which forms part of the Central Rand Group of the Witwatersrand Supergroup of rocks.

The CLR and VCR at Mponeng Mine are separated by approximately 900m of shales and quartzites. The CLR has historically been mined extensively at Savuka and TauTona mines and the remaining portions thereof have now been transferred to Mponeng Mine.

The CLR in the West Wits consists of, on average, a 20cm thick, tabular, auriferous quartz pebble conglomerate and three sedimentary facies. Economically, the most important facies is Unit 1, which overlies Unit 2. Unit 1 is a complex channel deposit that is only present along the eastern side of the West Wits lease area. Unit 2 can be up to 2m thick. Unit 3 is exposed in the southern edges of the lease area and is the oldest of the conglomerates.

### Mineralisation style

Gold mineralisation followed an episode of deep burial, fracturing and alteration. A variant of Archean gold bearing hydrothermal fluid was introduced into the conglomerates and circulated throughout in hydrothermal cells. The fluids precipitated gold and other elements through reactions that took place at elevated temperatures along the reef horizon, which was the more favourable fluid conduit. In the case of the VCR, the resulting gold grades are mostly uniformly distributed throughout the reef package. In the CLR, solid hydrocarbon precipitated in thin, at veins, usually at the base of the Carbon Leader conglomerate, and this is where the majority of the gold is concentrated.

### Mineralisation characteristics

The VCR displays strong alteration features, which can be explained by the hydrothermal fluids that infiltrated the reef and have overprinted on the original mineral assemblage. Portions of the reef contain authigenic sulphides such as pyrite, pyrrhotite, chalcopyrite, spahalerite and galena, incorporated in the conglomerate matrix. Gold associations with these mineral assemblages indicate a strong correlation of gold mobilisation and redistribution at the time of the hydrothermal fluid influx. There is also a strong association of gold with a chloritisation event focused along the reef horizon. The chlorite alteration gives a dark coloration to the reef.

Gold was precipitated by cooling and reactions between the fluids and wallrock, in this case pyritic conglomerates.

### Gold

mineralisation was enhanced in certain areas of high fluid throughput, which were often the sites of high carbon precipitation and early alteration in the case of the CLR.

Both the VCR and the CLR have been subjected to faulting and are intruded by a series of igneous dykes and sills of various ages that cross-cut the reefs. There is an inherent risk in mining through these faults and intrusives and a key objective of Mponeng Mine geologists is to identify these geological features ahead of the working face to assist with deciding on the best way to approach and mine through these structures.

#### EXPLORATION

Underground exploration in 2018 targeted the VCR areas to the west and down dip of the current mining on 123 and 126 Levels.

New reef intersections were achieved during 2018 and have been included in the evaluation of the geological model.

No CLR

exploration was possible during 2018 due to the lack of suitable drill sites.

The new surface drill hole UD61A started delivering core in March 2018 and has reached a depth of 1,631m. The drill hole is

planned to intersect the VCR target at a depth of 3,850m. Progress on the UD63 surface drill hole was halted in 2018.

#### PROJECTS

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SECTION 2 / SOUTH AFRICA

The Phase 1 VCR project is in production on 123 Level and is still accessing reef on 126 Level. On reef development continues east

and west and total production is expected to ramp up to 12,000m<sup>2</sup> per month.

The Mponeng LOM extension project PFS was reviewed and approved to progress to feasibility study (FS) in February 2017.

The PFS determined that the best business case is achieved by accessing the CLR orebody as well as the VCR orebody below

current Mponeng infrastructure to 136 Level (4,138m BMD). The LOM extension project scope of work replaces the phased project

approach by combining the Phase 2 project with Phases 3 and 4 into one project to access 9.5Moz and to extend the LOM to

2048. The project infrastructure consists of a ramp to access the first three levels while the sub shafts are deepened to establish

permanent logistic infrastructure for the six new mining levels. The FS is in progress and the project proposal will be presented to

the Board in 2019.

MINERAL RESOURCE  
DETAIL OF AVERAGE DRILL HOLE SPACING AND TYPE IN RELATION TO  
MINERAL

RESOURCE CLASSIFICATION

Mineral Resource by-product: uranium

Legend

N-S Geological cross-section through Mponeng – SS1 shaft section, CLR deepening project

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MPONENG CONTINUED

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Estimation

Gold values have been shown to be intimately related to conglomerate preservation of the VCR and form an integral part of the

geological model, as does the footwall lithology.

Mixed support co-kriging is used in the estimation of the Mineral Resource. It is a technique that enables the use of data of mixed

support, allowing both drill hole and underground sampling data to be used together. Estimation is performed on the VCR into

large block sizes, generally >210 x 210m, which fully capture the within-block variance, allowing the co-kriging of data of different

support sizes over long ranges. Estimation is done per geological homogeneous zone, in logarithmic space, because of the highly

skewed gold distribution. The final gold estimates are then calculated by back transforming the estimates, using lognormal four

parameter distribution models. Simple kriging is used for grade control and Measured Mineral Resource at a 30 x 30m block size

and constrained by the weight of the mean value. A similar process is followed for the CLR estimation.

Exclusive Mineral Resource

as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

Mponeng

Measured

6.64

19.83

131.75

4.24

Indicated

30.97

17.42

539.39

17.34

Inferred

10.62

13.88

147.43

4.74

Total

48.24

16.97

818.56

26.32

Current mining practice at the West Wits operations leaves behind a large portion of the Mineral Resource as stability pillars. Rock

engineering design models require stability to minimise the effects of mining induced seismicity on the deep underground workings.

Bracket pillars are also placed around all major geological structures to improve regional stability and to minimise the structure

associated risks. In future, the majority of the exclusive Mineral Resource will be taken up in stability pillars to reduce the impact of

seismicity. Other areas of the Mineral Resource that do not form part of the LOM include the areas between the Mineral Resource

and Ore Reserve cut-offs.

Mineral Resource below infrastructure

as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

Mponeng

Measured

0.34

22.73

7.77

0.25

Indicated

40.54

19.03

771.46

24.80

Inferred

17.49

15.05

263.19

8.46

Total

58.38

17.86

1,042.42

33.51

The portion of the Mineral Resource below infrastructure included those in the VCR WUDLs and the CLR Mineral Resource area.

Mponeng Mine infrastructure has only been developed to access the orebody up to 126 Level on the VCR and 120 Level on

the CLR.

Grade tonnage curve

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SECTION 2 / SOUTH AFRICA



MPONENG CONTINUED

Year-on-year, Mponeng's published Mineral Resource has decreased. The Mineral Resource of the TauTona and Savuka shaft

pillars have been removed as they will not be included in the LOM plan due to geotechnical constraints. Further reductions included

depletions and an increase in the required mining grade based on the current cost of extraction. There was a slight increase in

estimated content due to updates of the model methodology on the back of data updates.

Year-on-year changes in Mineral Resource

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SECTION 2 / SOUTH AFRICA

ORE RESERVE

Ore Reserve

as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

VCR above 109 Level

Proved

0.00

7.85

0.02

0.00

Probable

0.01

6.21

0.04

0.00

Total

0.01

6.76

0.06

0.00

VCR 109 to 120 Level

Proved

0.27

7.47

1.99

0.06

Probable

0.51

8.07

4.12

0.13

Total

0.78

7.87

6.11

0.20

VCR below 120 Level

Proved

0.57

10.09

5.73

0.18

Probable

5.85

12.09  
 70.67  
 2.27  
 Total  
 6.41  
 11.91  
 76.39  
 2.46  
 VCR LOM extension project  
 Proved  
 –  
 –  
 –  
 –  
 Probable  
 1.69  
 9.69  
 16.41  
 0.53  
 Total  
 1.69  
 9.69  
 16.41  
 0.53  
 VCR WUDLs  
 Proved  
 –  
 –  
 –  
 –  
 Probable  
 6.10  
 10.46  
 63.81  
 2.05  
 Total  
 6.10  
 10.46  
 63.81  
 2.05  
 TauTona CLR Eastern block  
 Proved  
 0.58  
 5.45  
 3.17  
 0.10  
 Probable  
 1.23  
 9.09  
 11.21  
 0.36

Total  
 1.81  
 7.93  
 14.38  
 0.46  
 CLR LOM extension project

Proved  
 0.02  
 8.96  
 0.22  
 0.01

Probable  
 19.64  
 9.41  
 184.85  
 5.94

Total  
 19.66  
 9.41  
 185.07  
 5.95

Mponeng

Total  
 36.47  
 9.93  
 362.24  
 11.65

Estimation

The mine design process delineates the mining areas and supporting development for each mining level and section, usually by extrapolating the existing mining design using the latest geological structure models and taking all relevant mine design recommendations into consideration. The in situ Mineral Resource is scheduled monthly for the full LOM plan. The value estimates for these schedules are derived from the Mineral Resource model.

Modifying factors are applied to the in situ Mineral Resource to arrive at an Ore Reserve estimate. These factors include a dilution factor to accommodate the difference between the milling width and the stoping width, as well as the Mine Call Factor (MCF).

Ore Reserve modifying factors

As a deep underground mine, the Mineral Resource at Mponeng is sensitive to a drop in gold price.

Inclusive Mineral Resource sensitivity

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SECTION 2 / SOUTH AFRICA

MPONENG CONTINUED

as at 31 December 2018

Gold

price

ZAR/kg

Cut-off

grade

g/t Au

Cut-off

value

cm.g/t Au

Stoping

width

cm

Dilution

%

MCF

%

MetRF

%

VCR above 109 Level

501,150

5.86

950

162.0

37.6

81.0

97.6

VCR 109 to 120 Level

501,150

6.03

950

157.5

38.0

81.0

97.6

VCR below 120 Level

501,150

7.27

950

130.7

41.1

81.0

97.9

VCR LOM extension project

501,150

7.08

950

134.2

47.7

83.1

97.6  
 VCR WUDLs  
 501,150  
 7.18  
 950  
 132.4  
 44.7  
 82.9  
 97.9  
 TauTona CLR Eastern Block  
 501,150  
 8.26  
 950  
 115.0  
 55.9  
 76.0  
 97.1  
 CLR LOM extension project  
 501,150  
 8.64  
 950  
 110.0  
 48.0  
 81.0  
 97.1  
 MCF is based on historic performance with consideration for current and future mining conditions.  
 Inferred Mineral Resource in business plan  
 as at 31 December 2018  
 Tonnes  
 million  
 Grade  
 g/t  
 Contained gold  
 tonnes  
 Moz  
 VCR WUDLs  
 3.21  
 11.03  
 35.45  
 1.14  
 CLR LOM extension project  
 0.20  
 9.97  
 2.01  
 0.06  
 Total  
 3.42  
 10.97  
 37.45  
 1.20

The Inferred Mineral Resource is used for optimisation purposes and forms part of the business plan but is not included in the Ore Reserve. These portions of the Mineral Resource are located in the WUDLs area beyond current infrastructure on the VCR (LOM extension project and Phase 5) and also make up part of the CLR Mineral Resource which is included in the CLR LOM extension and Phase 6 project. This accounts for 9.4% of the business plan.

Ore Reserve below infrastructure  
as at 31 December 2018

Category	
Tonnes	
million	
Grade	
g/t	
Contained gold	
tonnes	
Moz	
Mponeng	
Proved	
0.02	
8.96	
0.22	
0.01	
Probable	
27.43	
9.66	
265.07	
8.52	
Total	
27.46	
9.66	
265.29	
8.53	

The decrease of 4.2% in Ore Reserve is mainly due to the net effect of depletion, a revised estimation model for the VCR, the impact of the removal of Savuka shaft pillars as well as the removal of certain high risk areas in the TauTona mining front.

Year-on-year changes in Ore Reserve

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SECTION 2 / SOUTH AFRICA

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SECTION 2 / SOUTH AFRICA



## INTRODUCTION

### Property description

Surface Operations comprise Vaal River Surface, MWS and West Wits Surface operations. The operations produce gold by processing surface material such as low grade stockpiles and the retreatment of TSFs.

### Location

The Vaal River Surface operations are located to the north of the Vaal river, close to the town of Orkney in the North West province. These operations extract gold from the low grade stockpile material emanating as a by-product of the reef mining activities within the mines in the Vaal River area. The MWS operations are located approximately 15km from the town of Klerksdorp near Stilfontein within 20km of the Vaal River Surface operations. The MWS feed sources (TSFs) are scattered over an area that stretches approximately 13.5km north-south and 14km east-west. The West Wits Surface operations are located near the town of Carletonville, straddling the border between the North West and Gauteng provinces.

### History

Gold from surface material has been produced routinely since 2002. AngloGold Ashanti acquired the MWS Mineral Resource and tailings retreatment operations in the Vaal River region in July 2012. The MWS uranium and flotation plants were commissioned in 2014. Changes were made to the configuration of the flotation and uranium processes after which the float plant was recommissioned in July 2016 and the uranium plant in October 2016. These plants were reconfigured into an even more efficient configuration during 2016. As part of the optimisation in 2017, the uranium and flotation plants were decommissioned.

### Legal aspects and tenure

The MWS license to mine is covered by the environmental authorisation under the National Environmental Management Act No. 107 of 1998. In terms of the current legislation, the Mineral and Petroleum Resources Development Act No. 28 of 2002 (the MPRDA), a mining right is not required to reclaim TSFs. MWS can prove ownership and tenure of the operations. There was pending legislation that, once passed, would require a mining right to be obtained in order to mine TSFs. This Amendment Bill has subsequently been withdrawn by the Minister of Mineral Resources until further notice.

Following the Sale of the Vaal River underground operations, the Vaal River mining rights were transferred to Harmony, who acquired the Moab Khotsoeng Operations and Village Main Reef, who acquired the Kopanang Operations. In terms of the Vaal River Surface operations, the appropriate authorisation is currently in the process of being applied for.

The current mining rights for the South African operations cover multiple horizons, i.e. both underground and surface for West Wits region. The TSFs falling outside the mining right are accommodated in the approved EMP and financial provision for rehabilitation for the West Wits Mining Rights, as well as under historic surface rights permits for West Wits, which are still valid. A S102 application was submitted in March 2017 to consolidate West Wits Surface into GP30/5/1/2/2(01)MR.

### Mining method

#### Low grade stockpiles

Bulldozers are used to create safe loading faces. The material is then loaded from the face onto rail hoppers or trucks by means of front-end loaders and transported to the relevant gold plants for processing.

#### TSFs

The tailings are reclaimed using a number of hydraulic (high-pressure water) monitoring guns to deliver water at pressure, typically 27-30 bar, to the face. The tailings material is reclaimed by blasting the TSF face with the high-pressure water, resulting in the slurry gravitating towards pump stations. These monitoring guns can be positioned to selectively reclaim required areas from the TSFs. Bench heights are constrained by the force delivered from the monitoring gun nozzle and

safety constraints. With sufficient pressure, face lengths of up to 25m can be reclaimed.

The pump stations are located at the lowest point of the dams to ensure that the slurry from the dams will gravitate towards the pump station from where it will be pumped to the processing plants.

SURFACE OPERATIONS

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SECTION 2 / SOUTH AFRICA

#### Operational infrastructure

Low grade stockpiles in the Vaal River area are processed through the Kopanang Gold Plant which is a dedicated surface sources metallurgical plant while all AGA owned tailings material in the Vaal River and MWS areas is processed through the three metallurgical streams at the MWS metallurgical operations. At West Wits, material from both low grade stockpiles and TSF is processed through the Savuka gold plant. Low grade stockpile material is processed through the Mponeng gold plant to fill the processing gap and to ensure adequate supply of backfill material to Mponeng shaft. Adequate deposition capacity for the Surface Operations exists in all areas.

Operational infrastructure road, rail, offices, security services, water and power supply is adequate, and is shared with the AngloGold Ashanti operations in the relevant areas.

#### Mineral processing

The mineral process is dependent on the source material: tailings material is pumped directly to a conventional carbon-in-leach (CIL) plant while hard rock material will go through comminution first, and then be processed through leach followed by CIP.

MWS comprises three separate streams namely Stream 1, Stream 2 and Stream 3. Hydraulically-reclaimed material from several TSF sites is pumped via the 3 pump stations to the MWS plant streams for gold extraction.

The West Wits Surface Operations process low grade stockpile material sourced from the mining of the CLR and the VCR that are mined by the West Wits mines in the Carletonville/Fochville area, as well as hydraulically-reclaimed material from the Old North TSF.

Within the Vaal River area, the Kopanang Gold plant is a dedicated surface operation plant. In the West Wits area, the Savuka gold plant is dedicated to process surface sources material while low grade stockpile material is processed through Mponeng gold plant to fill the processing gap.

#### Risks

There are no known unmanaged risks that may affect reclamation activities.

The increased recovery over MWS LOM is associated with the project to introduce Aachen Reactors in the 3 streams and is still being evaluated.

Map showing MWS and Vaal River Surface infrastructure and properties

#### Mine infrastructure

Plant

Stockpiles

TSF

Tailings pipeline

AGA property

Chemwes

Settlements

Towns

Villages

Roads

Main

River

MWS centroid co-ordinates

26°48'00"E, 26°50'05"S

2.5

0

2.5

5

7.5km

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SECTION 2 / SOUTH AFRICA

SURFACE OPERATIONS CONTINUED

Map showing West Wits Surface and Mponeng Mine infrastructure and licences

Competent Persons

Responsibility

Competent Person

Professional

organisation

Membership

number

Relevant

experience

Qualification

Mineral Resource

Mmataseleng Maipushi

SACNASP

114 390

8 years

BSc Hons (Geology)

Ore Reserve

Mariaan Gagiano

SAIMM

705 920

34 years

Government Certificate of

Competency in Assaying (GCC)

GEOLOGY

The material contained in the TSFs and low grade stockpiles originates from the historic ore-bearing reefs mined by the West Wits,

Vaal River, Buffelsfontein, Hartebeestfontein and Stilfontein gold mines.

Low grade stockpiles

The low grade stockpiles consist of waste rock mined from underground workings, hoisted, transported and deposited via conveyor

belts. The gold contained within these dumps was sourced from three areas namely:

- 
- Minor reef intersected while accessing the primary reef
- 
- Gold-bearing reef that was contained within small fault blocks that were exposed by off-reef development
- 
- Cross-tramming of gold-bearing reef material to the waste tips

Mponeng

plant centroid co-ordinates

27°26'06"E, 26°26'11"S

Licences

Mining

Surface property

Mine infrastructure

Mine area

Plant

Stockpiles

TSF

Tailings pipeline

Underground workings

Settlements

Towns

Villages

Roads

Main

Secondary

1

0

1

2km

38

SECTION 2 / SOUTH AFRICA

Tailings storage facilities

The TSFs consist of tailings material which originated from the processing of the underground ore from the various operations

in the Vaal River area (Vaal Reef Surface), the various operations in West Wits area (West Wits Surface) and Buffelsfontein,

Hartebeestfontein and Stilfontein gold mines (MWS). These gold mines are deep level gold mines, which predominantly extract the

tabular, conglomeratic Vaal Reef (VR), CLR and VCR. The VR has been predominantly mined for gold in the past although the reef

also contains uranium oxide. The same is true but, to a lesser extent, with the CLR and VCR. The material contained in the TSFs is

fine in nature. The footprints of the MWS TSFs and Vaal River Surface operations TSFs cover an area of approximately 1,100ha.

South East TSF grade model section view along the west to east direction

Gold Grade (g/t)

0  
100  
200  
300  
700  
600  
500  
400  
1:7,500

Gold Grade (g/t)

0 – 0.164  
0.164 – 0.185  
0.185 – 0.230  
0.230 – 0.241  
0.241 – 0.299  
0.299 – 0.345  
0.345 – 0.402  
>= 0.402

PROJECTS

MWS plant deposition takes place on the Kareerand TSF. The existing Kareerand TSF was commissioned in 2011 with a design life

of 14 years to 2025 at a tailings throughput rate of 1.9 million tonnes per month (Mtpm). Since commissioning, MWS has ramped

up production and has targeted a total tailings throughput rate of 2.5 Mtpm until 2042. The increased deposition on the existing

facility means that the TSF will reach its limiting rate of rise sooner than 2025, with consequent loss of storage capacity. A PFS

has been concluded to establish the best option for expanding the capacity, and confirming the technical and financial viability of

the project. Work on applying for the permits required to construct the TSF extension has begun and the application process will

commence in 2019.

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SECTION 2 / SOUTH AFRICA

SURFACE OPERATIONS CONTINUED

MINERAL RESOURCE

Details of average drill hole spacing and type in relation to Mineral Resource classification

Category

Spacing m (-x-)

Type of drilling

Comments

Diamond

RC

Blasthole

Channel

Other

Vaal River Surface

Measured

50 x 50

-

-

-

-

√

Auger drilling

Indicated

100 x 100 to 150 x 150

-

-

-

-

√

Auger drilling

Inferred

-

-

-

-

-

-

Grade/ore control

50 x 50 to 100 x 100

-

-

-

-

√

Auger drilling

Mine Waste Solutions

Measured

100 x 100 to 320 x 250

-

-

-

—  
√  
Auger drilling  
Indicated  
100 x 100 to 300 x 375

—  
—  
—

√  
Auger drilling  
Inferred

—  
—  
—  
—  
—  
—  
—

Grade/ore control  
50 x 50 to 100 x 100

—  
—  
—  
—

√  
Auger drilling  
West Wits Surface  
Measured

—  
—  
—  
—  
—  
—  
—

Indicated  
150 x 150

—  
—  
—  
—

√  
Auger drilling  
Inferred

—  
—  
—  
—  
—  
—



–  
Grade/ore control  
150 x 150

–  
–  
–  
–

√  
Auger drilling

In the case of TSFs, additional sampling information is available in the form of residue sampling data collected during deposition on the TSFs.

40

SECTION 2 / SOUTH AFRICA

Inclusive Mineral Resource  
as at 31 December 2018

Category

Tonnes  
million

Grade

g/t

Contained gold

tonnes

Moz

Vaal River Surface

TSFs

Measured

–

–

–

–

Indicated

323.63

0.25

82.42

2.65

Inferred

–

–

–

–

Total

323.63

0.25

82.42

2.65

Low grade stockpiles

Measured

–

–

–

–

Indicated

–

–

–

–

Inferred

10.09

0.51

5.13

0.16

Total

10.09

0.51

5.13  
0.16  
Mine Waste Solutions  
TSFs  
Measured  
105.96  
0.21  
22.76  
0.73  
Indicated  
172.57  
0.26  
44.94  
1.44  
Inferred  
—  
—  
—  
—  
Total  
278.53  
0.24  
67.71  
2.18  
West Wits Surface  
TSFs  
Measured  
—  
—  
—  
—  
Indicated  
55.10  
0.30  
16.31  
0.52  
Inferred  
0.86  
0.30  
0.26  
0.01  
Total  
55.96  
0.30  
16.57  
0.53  
Low grade stockpiles  
Measured  
—  
—  
—

–  
 Indicated  
 5.56  
 0.50  
 2.80  
 0.09  
 Inferred  
 –  
 –  
 –  
 –  
 Total  
 5.56  
 0.50  
 2.80  
 0.09  
 Surface Operations  
 Total  
 673.77  
 0.26  
 174.62  
 5.61  
 Inclusive Mineral Resource by-product: uranium  
 as at 31 December 2018  
 Category  
 Tonnes  
 million  
 Grade  
 kg/t  
 Contained uranium  
 tonnes pounds million  
 Vaal River Surface  
 Measured  
 –  
 –  
 –  
 –  
 Indicated  
 323.63  
 0.08  
 25,430  
 56.06  
 Inferred  
 –  
 –  
 –  
 –  
 Total  
 323.63  
 0.08  
 25,430

56.06

Mine Waste Solutions

Measured

105.96

0.07

7,228

15.94

Indicated

172.57

0.08

13,886

30.61

Inferred

—

—

—

—

Total

278.53

0.08

21,115

46.55

Surface Operations

Total

602.16

0.08

46,544

102.61

41

SECTION 2 / SOUTH AFRICA

## SURFACE OPERATIONS CONTINUED

### Estimation

#### TSFs

Prior to 2011 for the Vaal River operations, the grade estimations for the TSFs were based on the residue grades obtained from the different process plants, as well as various ad hoc sampling projects in selected areas. Most of the TSFs in Vaal River and MWS have since been re-sampled by means of an extensive drilling exercise which commenced in 2011. The remainder TSFs will be re-sampled once the TSFs become dormant. A stringent QA/QC process was applied to the sampling and assay processes to ensure a high level of confidence in the results. The auger drilling typically took place on a 150 x 150m grid (Mineral Resource model) as well as a minimum of a 50 x 50m grid (grade control model). The vertical sampling interval of 1.5m was implemented and where possible all drill holes were drilled into the underlying strata to allow the estimation of the base of the TSF. The estimation technique used is 3D ordinary kriging. The variograms used for the grade estimation consist of both horizontal and downhole variograms. The methodology used for the construction of the grade model constitutes well defined 3D wireframes which are constructed using the drill holes and the results from monthly surveys on currently reclaimed TSFs and aerial surveys carried out on an annual basis for TSFs which are planned to be reclaimed. These models are regularly updated during the grade control process. In the West Wits Surface operations, all the grade estimations for the TSFs were based on the residue grades obtained from the different process plants as well as various ad hoc sampling projects in selected areas. For one of these areas, the Old North Complex, a drilling programme with the standard QA/QC programme was implemented in 2015. The drilling was completed in 2018 and the 3D estimate will be finalised in 2019.

#### Low grade stockpiles

In the West Wits and Vaal River operations, the grade estimation is based on grades obtained from reclaimed tonnages from the different stockpiles, grades obtained from rock deposited on these facilities and grades from various other sampling projects carried out on some of the stockpiles. These sampling exercises involved a pit being dug on a pre-determined grid on the low grade stockpiles from which samples were taken. These samples were then split into different size fractions and assayed to determine the gold distribution for the different size fractions. The profiles of the stockpiles are also updated by means of aerial surveys carried out on an annual basis. Sampling is done by means of mechanical stop belt samplers on the feed belts at the metallurgical plants.

Changes in the Mineral Resource are mainly due to Mispah 1, Kopanang Paydam TSFs and Moab Khotsong low grade stockpile being moved out of the Mineral Resource following the Harmony sale, the acquisition of new low grade stockpiles into Inferred

Mineral Resource and normal depletion of the Mineral Resource.

Year-on-year changes in Mineral Resource

SECTION 2 / SOUTH AFRICA

ORE RESERVE

Ore Reserve

as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

Vaal River Surface

TSFs

Proved

–

–

–

–

Probable

324.23

0.25

82.42

2.65

Total

324.23

0.25

82.42

2.65

Mine Waste Solutions

TSFs

Proved

106.23

0.21

22.76

0.73

Probable

172.79

0.26

44.94

1.44

Total

279.02

0.24

67.71

2.18

West Wits Surface

TSFs

Proved

–

–

–



—  
Probable  
27.60  
0.29  
7.97  
0.26  
Total  
27.60  
0.29  
7.97  
0.26  
Low grade stockpiles  
Proved

—  
—  
—  
—  
Probable  
4.37  
0.49  
2.14  
0.07  
Total  
4.37  
0.49  
2.14  
0.07

Surface Operations

Total  
635.23  
0.25  
160.23  
5.15

Surface Operations is not sensitive to changes in gold price.

Inclusive Mineral Resource sensitivity

43

SECTION 2 / SOUTH AFRICA

SURFACE OPERATIONS CONTINUED

Estimation

TSFs

Mine design models delineate the areas to be reclaimed over the life of the operations, taking all relevant mine design recommendations into consideration. The in situ Mineral Resource is scheduled for the full LOM plan. The value estimates for these

schedules are derived from the Mineral Resource block models where they exist. The benefit of the reclamation of the surface

sources and subsequent rehabilitation of the relevant areas is included in the evaluation of the feasibility of the project.

Low grade stockpiles

Planned reclamation from the low grade stockpiles is scheduled out to ensure an average blend. The in situ Mineral Resource is

scheduled for the full LOM plan. The value estimates for these schedules are derived from the Mineral Resource estimate with an

18 month reconciliation factor applied to the Mineral Resource.

Ore Reserve modifying factors

as at 31 December 2018

Gold

price

ZAR/kg

Cut-off

grade

g/t Au

RMF

% (based

on tonnes)

RMF

% (based

on g/t)

MCF

%

MetRF

%

Vaal River Surface

TSFs

501,150

0.23

100.0

100.0

100.0

52.8

Mine Waste Solutions

TSFs

501,150

0.23

100.0

100.0

100.0

52.8

West Wits Surface

TSFs

501,150

0.29

100.0

100.0

100.0

45.0

Low grade stockpile

501,150

0.28

100.0

85.0

100.0

88.0

10% margin applied for cut-off grade calculations apart from Vaal River Surface low grade stockpiles which uses a 5% margin.

Minor dilution of the TSF tonnes occurs when reclamation of the floor area of the TSF is done. During reclamation it is also possible

that small quantities of basement material is included with the TSF floor material. A small dilution factor has been included to

account for them both. The metallurgical recovery factor (MetRF) for TSF material ranges between 42% and 60% depending on the

metallurgical plant and for low grade stockpile material processed ranges between 87% and 90%.

For the low grade stockpiles a Mineral Resource factor is applied which is based on an 18 month rolling average of the actual

evaluation factor.

Inferred Mineral Resource in business plan

as at 31 December 2018

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

Vaal River Surface

Low grade stockpile

9.45

0.50

4.71

0.15

Total

9.45

0.50

4.71

0.15

44

SECTION 2 / SOUTH AFRICA

In addition to normal depletion's in all areas during 2018 Ore Reserve, the Moab Khotsong low grade stockpile and Kopanang TSF were included in the sale to Harmony and thus excluded from the Ore Reserve estimate this year.

Year-on-year changes in Ore Reserve

45

SECTION 2 / SOUTH AFRICA

CONTINENTAL AFRICA

LEGEND

1

Guinea Siguiri (85%)

2

Mali Morila (40%)/Sadiola (41%)

3

Ghana Iduapriem/Obuasi

4

DRC Kibali (45%)

5

Tanzania Geita

2,000km

Project

Operation

0

Tanzania – Geita

CONTENTS

Regional overview

47

DRC

50

Ghana

62

Guinea

86

Mali

102

Tanzania

120

46

SECTION 3 / CONTINENTAL AFRICA

REGIONAL OVERVIEW

Key statistics

Units

2018

2017

2016

Operational performance

Tonnes treated/milled

Mt

27.3

28.0

27.6

Recovered grade

oz/t

0.050

0.047

0.043

g/t

1.72

1.61

1.49

Gold production (attributable)

000oz

1,512

1,453

1,321

Total cash costs

\$/oz

773

720

717

Total production costs

\$/oz

1,028

1,012

1,005

All-in sustaining costs

(1)

\$/oz

904

953

904

Capital expenditure (attributable)

\$m

313

409

291

(1)

Excludes stockpile write-offs

As at December 2018, the total attributable Mineral Resource (inclusive of the Ore Reserve) for the Continental Africa region was 64.1Moz (2017: 64.1Moz) and the attributable Ore Reserve 16.3Moz (2017: 16.9Moz).

This is equivalent to 35% and 37% of the group's Mineral Resource and Ore Reserve respectively. Combined production from these operations totalled 1.512Moz of gold in 2018, or 45% of group production.

AngloGold Ashanti has seven mining operations within the Continental Africa region:

- Kibali in the Democratic Republic of the Congo (DRC), a joint venture (JV) with Barrick Gold Corporation (Barrick) and Société

- Minière de kilo-Moto (SOKIMO), the state-owned gold mining company

- Iduapriem in Ghana

- Obuasi in Ghana

- Siguiri in Guinea

- Morila in Mali, a JV with Barrick and the state of Mali

- Sadiola in Mali, a JV with IAMGOLD and the state of Mali

- Geita in Tanzania

Mining is from both open pit and underground, with Obuasi being an underground mine, Iduapriem, Siguiri and Sadiola being open

pit mines and Kibali and Geita being a combination of open pit and underground mines. Morila is primarily a tailings retreatment operation.

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SECTION 3 / CONTINENTAL AFRICA

REGIONAL OVERVIEW CONTINUED

Inclusive Mineral Resource

as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

Continental Africa

Measured

42.17

2.04

85.94

2.76

Indicated

469.94

2.57

1,209.71

38.89

Inferred

202.51

3.43

695.30

22.35

Total

714.62

2.79

1,990.95

64.01

Exclusive Mineral Resource

as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

Continental Africa

Measured

5.05

4.85

24.49

0.79

Indicated

292.05

2.56



747.70  
24.04  
Inferred  
199.75  
3.47  
693.42  
22.29  
Total  
496.85  
2.95  
1,465.62  
47.12  
Ore Reserve  
as at 31 December 2018  
Category  
Tonnes  
million  
Grade  
g/t  
Contained gold  
tonnes  
Moz  
Continental Africa  
Proved  
35.92  
1.57  
56.31  
1.81  
Probable  
170.89  
2.64  
451.70  
14.52  
Total  
206.81  
2.46  
508.01  
16.33  
48  
SECTION 3 / CONTINENTAL AFRICA

Guinea – Siguiri

49

SECTION 3 / CONTINENTAL AFRICA

DEMOCRATIC REPUBLIC OF THE CONGO

AngloGold Ashanti owns 45% of Kibali in the DRC.

The operation is a JV between three separate entities:

- AngloGold Ashanti
- Barrick, following its merger with Randgold Resources Limited
- Société Minière de kilo-Moto (SOKIMO), the state-owned gold mining company

The consolidated lease is made up of 10 mining concessions.

DRC – Kibali

50

SECTION 3 / CONTINENTAL AFRICA

Inclusive Mineral Resource  
as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

Democratic Republic of the Congo

Measured

9.17

4.60

42.16

1.36

Indicated

44.71

3.05

136.37

4.38

Inferred

23.77

2.50

59.40

1.91

Total

77.65

3.06

237.93

7.65

Exclusive Mineral Resource

as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

Democratic Republic of the Congo

Measured

1.42

2.68

3.81

0.12

Indicated

22.68

2.43

55.11

1.77  
Inferred  
23.77  
2.50  
59.40  
1.91  
Total  
47.87  
2.47  
118.32  
3.80  
Ore Reserve  
as at 31 December 2018  
Category  
Tonnes  
million  
Grade  
g/t  
Contained gold  
tonnes  
Moz  
Democratic Republic of the Congo  
Proved  
9.14  
4.15  
37.87  
1.22  
Probable  
19.08  
4.12  
78.70  
2.53  
Total  
28.22  
4.13  
116.57  
3.75

LEGEND

1  
Kibali (45%)  
Operation  
300km

0

51

SECTION 3 / CONTINENTAL AFRICA

## KIBALI

### INTRODUCTION

#### Property description

Operations presently focus on open pit and underground mining. Development of the underground mine commenced in 2013 and production ramped up to 3.5Mt in 2018. Initial production was via a twin decline from surface. From 2018 the majority of ore is hoisted up the shaft. The decline to surface is used to haul some of the shallower zones and to supplement shaft haulage.

#### Location

Kibali is located in the north-eastern part of the DRC near the international borders with Uganda and South Sudan. The mine is located adjacent to the village of Doko, which is located to the west of the lease area. Kibali is approximately 210km by road from Arua and immediately north of the district capital of Watsa. The operations area falls within the administrative territory of Watsa in Haut-Uélé province.

#### History

On 15 October 2009, AngloGold Ashanti acquired a 50% indirect interest in Moto Goldmines Limited through a JV with Randgold, with Moto holding a 70% stake in Kibali and the balance (30%) being held by the DRC parastatal, SOKIMO. On 21 December 2009, Randgold and AngloGold Ashanti increased their JV interest in Kibali to 90%, while SOKIMO retained a 10% holding. On 2 January 2019, Randgold Resources Limited merged with Barrick Gold Corporation and the JV is now with the combined company, trading as Barrick Gold Corporation (Barrick).

First gold was poured in September 2013 from the open pit operations. Development of the underground mine commenced in 2013. The first underground development ore was mined in 2013 and stoping commenced in 2015. Underground production has since ramped up to 1.8Mt in 2017 and 3.5Mt in 2018. Initial production was truck hauled by a twin decline to surface. In 2017 the haulage shaft (740m deep) and materials handling system were commissioned.

#### Legal aspects and tenure

The total Ore Reserve is covered by exploitation permits (11447, 11467, 11468, 11469, 11470, 11471, 11472, 5052, 5073 and 5088) totalling 1,836km<sup>2</sup>. Kibali gold mine has been granted the ten exploitation permits under the DRC mining code, seven of which are valid until 2029 and three are valid until 2030.

#### Mining method

The mine comprises both open pit and underground mining. The open pit Ore Reserve shell optimisations are conducted on the Mineral Resource models. Detailed mine designs are then completed for open pit mining. This incorporates the mining layout, operating factors, stripping ratio and relevant cut-off grades and modifying factors required for the reporting of Ore Reserve. For the underground operation, longitudinal and transverse longitudinal stoping methods with paste backfill are the current underground mining methods.

#### Operational infrastructure

The mine site is located within 160km of the border with Uganda and all transport links take place through Uganda to Kenya or Tanzania. Surface infrastructure associated with the overall Kibali operation includes a processing plant, tailings storage facility, camp, hydro and thermal power stations, airstrip, workshops and offices.

All necessary government agreements and approvals required for the mine are in place.

#### Mineral processing

The current processing plant can treat both oxide and fresh sulphide material and is configured for flotation and ultra-fine grind of the flotation concentrate, a treatment that is required for the sulphide ore type before leaching.

#### Risks

There are no known material risks that will impact on the Mineral Resource and Ore Reserve.

#### Competent Persons

#### Responsibility

Competent Person  
Professional  
organisation  
Membership  
number  
Relevant  
experience  
Qualification  
Mineral Resource and  
Ore Reserve  
Simon Bottoms\*  
Geological Society  
of London  
(FGS CGeol)  
1 023 769  
9 years  
MGeol

\* Employed by Barrick as SVP, Africa and Middle East Mineral Resource Manager, 3rd Floor, Unity Chambers, 28 Halkett Street, St. Helier, Jersey, Channel Islands

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SECTION 3 / CONTINENTAL AFRICA

Map showing Kibali Mine infrastructure and licences with the total mining lease area insert shown in the top right-hand corner

Licences

Mining

Mine Infrastructure

Pits

Plant

Stockpiles

TSF

Waste dumps

Underground workings

Settlements

Towns

Villages

Roads

Main

Secondary

Airfield

Insert

Total mining lease area

Map zoomed in area

0

1

2

3km

Plant centroid co-ordinates

29°35'31"E, 3°6'50"N

0

10

20km

Total mining lease area

53

SECTION 3 / CONTINENTAL AFRICA



KIBALI CONTINUED

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SECTION 3 / CONTINENTAL AFRICA

## GEOLOGY

### Deposit type

Deposits of the Kibali district are located in the Archean Moto Greenstone Belt bounded to the north by the West Nile Gneiss and

to the south by plutonic rocks of the Watsa district. The belt comprises three lithostratigraphically distinct blocks.

Psammopelitic

schists, amphibolite, banded iron formation, and gneissic granitoid sills metamorphosed under upper greenschist to low-mid-

amphibolite facies conditions form the eastern part of the belt. Relative weakly foliated basalts, cherts, siliciclastic rocks, dacitic

volcanoclastic rocks, and carbonaceous argillite metamorphosed under mid to upper greenschist facies conditions comprise

the central and western-most parts of the belt. Granitoid plutons as old as ca. 2,640Ma intrude these rocks. A thick package of

immature sandstone, gritstone, conglomerate, and probably acid tuffs forms much of the western part of the belt, including the host

rocks to Karagba, Chauffeur and Durba (KCD), the largest deposit discovered to date within the belt. Radiometric dating indicates

these siliclastic rocks were deposited during a belt-wide basin extension event between ca. 2,629Ma and 2,626Ma with much of

the detritus derived from adjacent older parts of the belt.

Boundaries between these lithostratigraphic blocks represent important exploration targets.

The main Kibali deposit consists of the combination of the KCD deposit. Currently only the KCD deposit hosts an underground Ore

Reserve and this constitutes 84% of the total KCD Ore Reserve.

### Mineralisation style

Gold deposits of the Kibali district are classified as Archean orogenic gold deposits. At Kibali, the gold deposits are largely hosted

in siliciclastic rocks, banded iron formations and chert that were metamorphosed under greenschist facies conditions.

Ore-forming

H

2

O-CO

2

-rich fluids migrated along a linked network of gently northeast-dipping shears and northeast to north-northeast plunging

fold axes that is commonly referred to as the KZ Trend. The richly mineralised KZ Trend appears to have initiated as an extensional

fault system along the boundary between the relatively young basin in the western part of the belt and older rocks to the east.

Mineralisation occurred during the later stages of subsequent regional contractional deformation, which resulted in inversion of the

basin and the development of reverse faults and folds. Ongoing deformation during hydrothermal activity resulted in development

of lodes in a variety of related structural settings within the KZ Trend. The source(s) of metal and fluids, which formed the deposits

remain unknown, but metamorphic devolatilisation reactions within the supracrustal rocks of the Moto Greenstone Belt and/or

deeper fluid and metal sources may have contributed.

Mineralisation characteristics

Gold deposits of the Kibali district are associated with halos of quartz, ankerite and sericite (ACSA-A alteration) that extend for 10s to 100s of metres into the adjacent rocks. This widespread ACSA-A alteration assemblage is superimposed on older greenschist facies metamorphic assemblages. Locally in the vicinity of the main mineralised zones ACSA-A alteration is overprinted by ankerite-siderite, pyrite alteration (ACSA-B) that hosts the ore. Gold is directly associated with the ACSA-B alteration assemblage. In smaller peripheral deposits a late chlorite, carbonate, pyrite assemblage is associated with the ore rather than the ACSA-B assemblage, implying a district-wide zonation of mineral assemblages along and across the mineralised KZ Trend. Zones of auriferous ACSA-B alteration are commonly developed along the margins of banded iron formation, or contacts between chert, carbonaceous phyllite, and banded iron formation. Mineralised rocks in the Kibali district typically lack significant infill quartz-rich veins, unlike many other orogenic gold deposits. Gold is instead associated with pyrite in zones of alteration that replaced the earlier mineralogy of the host rocks. Local remobilisation and upgrading of ACSA-B related ore occurred adjacent to the margins of some post-ore crosscutting chlorite, carbonate, pyrite, magnetite-altered diorite dykes. The location of the individual lodes within the KCD deposit are intimately controlled by the position, shape, and orientation of a series of gently northeast-plunging tight to isoclinal folds. The ACSA-A alteration developed during the formation of these folds, and the sericite foliation which is an integral part of the ACSA-A assemblage formed parallel to their axial planes. Zones of later auriferous ACSA-B alteration developed along the axes, limbs, and more rarely the axial planes of these folds, locally wrapping around the hinges of the folds to form elongate northeast-plunging concave-shaped rods. ACSA-B alteration is also commonly focused along the margins of more extensive banded iron formations, indicating a stratigraphic as well as structural control on the distribution of ore, both within KCD, and other parts of the wider KZ Trend. Shear zones that were active during folding are a third key structural control on the location of ore within KCD and the wider KZ Trend. At KCD a folded carbonaceous shear in the core of the deposit juxtaposes stratigraphically distinct blocks. The 3,000 lodes above this shear are hosted by locally ferruginous cherts, carbonaceous argillites, and minor greywacke, whereas the 5,000 and 9,000 lodes below are hosted by siliciclastic rocks and banded iron formation. Fold shapes and wavelength differ between the two blocks reflecting their different rheologies during folding, and this is reflected in the scale, shape, and continuity of lodes in each block. At Pakaka and Kalimva chlorite, carbonate, pyrrhotite, pyrite-altered shear zones rather than folds are the principal controls on gold distribution.

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SECTION 3 / CONTINENTAL AFRICA

KIBALI CONTINUED

NW-SE Geological cross-section through the KCD orebody, elevation in metres relative to average mean sea level

0

50km

Younging direction

Inferred major fault

Fold axial plane

Chert

BIF

Carbonaceous phyllite

ACSA-A alteration

Disseminated magnetite cubes and/or relic BiF

Disseminated magnetite cubes and/or

relic BiF in ACSA-B (altered BIF rocks)

ACSA-B alteration

Late carbonaceous shear

Mafic dyke

Mineralisation

KCD current pit outline

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SECTION 3 / CONTINENTAL AFRICA

## EXPLORATION

In 2018, exploration focused on the down plunge and up plunge extensions of the KCD 3000, 5000 and 9000 lodes.

The 3000 lode

was drilled from surface to upgrade and convert Inferred Mineral Resource to Indicated Mineral Resource and allow for conversion

to open pit Ore Reserve, while drilling was conducted from underground to test the down plunge extents. The down plunge extent

of the 5000 lode above the haulage level was targeted to test for continuity of the 5101 and 5102 lodes a further 250m down

plunge from the known Mineral Resource. The drilling on the 3000 and 5000 lodes was conducted from a dedicated underground

exploration drill drive on the 290 Level. On the 9000 lode, the gap between the Sessenge Pit and 9000 lode

underground was drill

tested from surface on a 100 x 100m spacing to determine continuity and grade distribution.

Alongside this, 2018 regional exploration focused on new discoveries, near mine opportunities, and Mineral Resource additions.

The most notable result was the definition of an Inferred Mineral Resource at Kalimva and Ikamva, which replaced the 2018 annual

depletion of Kibali Mineral Resource. In addition, first pass Reverse Circulation (RC) drilling was performed at Oere, successfully

identifying a 2km shear zone.

The 2019 regional exploration will continue to focus on the identification of new opportunities and the testing of gaps between

known Mineral Resource such as the Gorumbwa-Sessenge Gap. Further Mineral Resource extension exploration is scheduled

to target the down plunge extensions of the KCD 5000 lode focussing above the bottom level of the shaft, with drilling from a

dedicated underground exploration drill drive. In addition, a PFS will be completed with the target of upgrading of Kalimva and

Ikamva Inferred Mineral Resource to an Indicated Mineral Resource, and defining appropriate modifying factors such that they can

be incorporated into an Ore Reserve.

## PROJECTS

Underground ore production more than doubled from 2017, with 3,465kt mined during the first year of full vertical shaft operation.

During 2019 the evaluation of a new Waste Pass system in KCD underground will be completed, with the potential of reducing

backfill costs and enabling the use of local contractors for haulage from surface waste dumps. In addition the Newtrax RFID tracking

system is planned to be implemented for underground equipment and personnel, providing cost benefits through automation of

secondary ventilation and improved equipment utilisation.

## MINERAL RESOURCE

Details of average drill hole spacing and type in relation to Mineral Resource classification

Category

Spacing m (-x-)

Type of drilling

Diamond

RC

Blasthole

Channel

Other

Measured

5 x 10, 15 x 20

√

√

√

√

√

√

√

√

—

—

—

Indicated

40 x 40

—

—

—

Inferred

80 x 80

—

—

—

Grade/ore control

5 x 10, 15 x 20

—

—

—

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SECTION 3 / CONTINENTAL AFRICA

KIBALI

CONTINUED

Inclusive Mineral Resource

as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

Open pit

Measured

4.87

2.51

12.21

0.39

Indicated

14.53

2.12

30.81

0.99

Inferred

13.41

1.99

26.68

0.86

Total

32.80

2.13

69.70

2.24

Underground

Measured

3.27

8.44

27.58

0.89

Indicated

30.18

3.50

105.56

3.39

Inferred

10.36

3.16

32.72

1.05

Total

43.81

3.79  
 165.85  
 5.33  
 Stockpile  
 Measured  
 1.04  
 2.29  
 2.37  
 0.08  
 Indicated

–  
 –  
 –  
 –  
 Inferred

–  
 –  
 –  
 –  
 Total

1.04  
 2.29  
 2.37  
 0.08  
 Kibali  
 Total  
 77.65  
 3.06  
 237.93  
 7.65

Estimation

Mineral Resource estimation is undertaken by Barrick in-house Competent Persons or by approved external consultants. The results of both DD and of RC drilling are used in the estimation process. 3D mineralised envelopes are established using grade and geology and these are then statistically verified to confirm their validity for use in grade estimation. Appropriate domaining of homogeneous zones is conducted whereby high-grade central core areas are modelled separately from the lower-grade surrounding halos. Volumes are then filled with block model cells and these are then interpolated for density, rock type and grade, the latter using ordinary kriging. Grade top cuts are applied to drill hole data to prevent the spread of high grades during the estimation process. Drill hole spacing is used to guide the Mineral Resource classification. The open pit Mineral Resource is quoted within a limiting shell. The underground Mineral Resource is constrained by the application of optimised mineable Mineral Resource shapes, which applies reasonable mineability constraints including a minimum mining width, a reasonable distance from current or planned development, and a measure of assumed profitability at the related Mineral Resource cut-off grade. Grade tonnage curves  
 The grade tonnage curves do not include stockpiles.



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SECTION 3 / CONTINENTAL AFRICA

Exclusive Mineral Resource  
as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

Kibali

Measured

1.42

2.68

3.81

0.12

Indicated

22.68

2.43

55.11

1.77

Inferred

23.77

2.50

59.40

1.91

Total

47.87

2.47

118.32

3.80

The exclusive Mineral Resource for the open pits largely comprise of Inferred Mineral Resource and tonnages that occur below the

Ore Reserve cut-off grade (due to gold price difference). At the KCD deposit it is also partially due to the selection of a fixed interface

between the open pit and the underground mining areas. Both the open pit Mineral Resource and underground material below the

Ore Reserve mining cut-off form a significant part of this material.

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SECTION 3 / CONTINENTAL AFRICA

KIBALI CONTINUED

ORE RESERVE

Ore Reserve

as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

Open pit

Proved

3.66

2.57

9.40

0.30

Probable

5.10

2.30

11.72

0.38

Total

8.75

2.41

21.12

0.68

Underground

Proved

5.48

5.20

28.48

0.92

Probable

13.99

4.79

66.98

2.15

Total

19.47

4.90

95.46

3.07

Kibali

Total

28.22

4.13

116.57

3.75

Estimation

The open pit Ore Reserve shell optimisations were completed on the Mineral Resource models. This incorporated the mining

layout, operating factors, stripping ratio and relevant cut-off grade and modifying factors for reporting the Ore Reserve. An open pit

underground interface was set at 5,685mRL between the KCD open pit and underground mine.

Kibali is very sensitive to a decrease in gold price due to the nature of the underground mineralisation.

Year-on-year changes in Mineral Resource

Kibali was able to replace Mineral Resource ounces depleted as a result of the maiden reporting of the Kalimva and Ikamva open pit

Inferred Mineral Resource, as well as exploration extensions in KCD underground.

Inclusive Mineral Resource sensitivity

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SECTION 3 / CONTINENTAL AFRICA

A cut-off grade analysis at \$1,000/oz was used to determine a cut-off grade of 2.5g/t for the underground mine. Longitudinal and transverse longhole open stoping methods with paste backfill are the current preferred mining methods. Underground stope designs were updated from the previously reported Ore Reserve using the latest Mineral Resource models. Modifying factors for planned and unplanned rock dilution, backfill dilution and ore loss were applied to obtain the reported Ore Reserve. Metallurgical, environmental, social, legal, marketing and economic factors were adequately considered in the Kibali FS and have been updated as the project has developed. Ore Reserve modifying factors as at 31 December 2018

Gold  
price  
US\$/oz  
Cut-off  
grade  
g/t Au  
Dilution  
%  
Dilution  
g/t  
MCF  
%  
MetRF  
%

Open pit  
1,000  
1.53  
10.0  
—  
103.0  
84.5  
Underground  
1,000  
2.41  
4.0  
1.0  
103.0  
88.9

\$1,000/oz Ore Reserve price used by Barrick (operating partner), apart from KCD PB3 open pit which is at \$1,100/oz. Open pit modifying factors include 10% ore dilution and 97% mining recovery. Underground dilution was applied based on the proposed mining method and accounts for planned dilution, from internal waste, within designed mining shapes. Additional dilution is incorporated to account for paste filling and unplanned dilution from mining (1% to 13%). Ore loss of 4% is accounted for in the estimation of the final Ore Reserve. Metallurgical recovery is applied to individual production sources and material types based on metallurgical testwork and historical performance with recoveries ranging from 75% to 90% (2018 average recovery achieved was 88.7%).

The gold price applied to Ore Reserve estimation was \$1,000/oz across all open pits and underground sources with the exception of KCD PB3 open pit which was based on a gold price of \$1,100/oz. A 4.5% royalty was netted off the assumed gold price.

Inferred Mineral Resource in business plan

There is no Inferred Mineral Resource included in the reported Ore Reserve for Kibali. The current mine plan does not have any

reliance on the Inferred Mineral Resource to support the economic viability of the project for the main KCD deposit.

The Ore Reserve decreased year-on-year mainly due to depletion, partially offset by exploration success in the underground and

conversion drilling in the KCD open pit.

Year-on-year changes in Ore Reserve

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SECTION 3 / CONTINENTAL AFRICA

## GHANA

AngloGold Ashanti has two mines in Ghana. Obuasi, currently in a redevelopment phase, is an underground mine operating at depths of up to 1,500m with a continuous history of mining dating back to the 1890s and Iduapriem, an open pit mine.

Obuasi underground development is scheduled to start in Q1 2019 with first gold forecast for the end of 2019.

Obuasi and Iduapriem are both wholly owned by AngloGold Ashanti. Obuasi is located in the Ashanti region of southern Ghana, approximately 80km south of Kumasi. Mining was temporarily suspended at the end of 2014 while a series of economic studies progressed. Iduapriem is located in western Ghana, some 85km from the coast and south of Obuasi near the town of Tarkwa.

Ghana – Iduapriem

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SECTION 3 / CONTINENTAL AFRICA

Inclusive Mineral Resource  
as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

Ghana

Measured

6.84

3.27

22.35

0.72

Indicated

184.26

4.08

750.93

24.14

Inferred

77.77

5.90

458.67

14.75

Total

268.87

4.58

1,231.95

39.61

Exclusive Mineral Resource

as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

Ghana

Measured

3.51

5.57

19.55

0.63

Indicated

131.17

3.95

517.50



16.64  
Inferred  
75.01  
6.09  
456.79  
14.69  
Total  
209.69  
4.74  
993.84  
31.95  
Ore Reserve  
as at 31 December 2018

Category  
Tonnes  
million  
Grade  
g/t  
Contained gold  
tonnes

Moz

Ghana

Proved

2.74

0.88

2.41

0.08

Probable

56.66

4.07

230.82

7.42

Total

59.40

3.93

233.23

7.50

Project

Operation

LEGEND

1

Obuasi

2

Iduapriem

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SECTION 3 / CONTINENTAL AFRICA

## IDUAPRIEM

### INTRODUCTION

#### Property description

Iduapriem Mine is wholly owned by AngloGold Ashanti. It is a multiple open pit operation that currently sources ore from the Ajopa, Block 7 and Block 8 pits.

#### Location

Iduapriem Mine is located in the western region of Ghana, some 70km north of the coastal city of Takoradi and approximately 10km southwest of the town of Tarkwa. The mine is bordered in the north by Gold Fields Ghana Limited (Tarkwa Mine) and to the east by the Ghana Manganese Company Limited (a manganese mine in existence since the 1920s).

#### History

A FS was completed in 1990 and in October 1991 Golden Shamrock Limited began construction of a 1.36Mtpa semi-autogenous milling circuit and CIP plant. Mining commenced in August 1992 with the first gold pour achieved in September of that year. Golden Shamrock was acquired by Ashanti Goldfields Company Limited in 1996. In 2000, a portion of the non-operational Teberebie Goldfields Limited (a subsidiary of Pioneer Goldfields Limited) was purchased resulting in increased Ore Reserve and extended LOM. In 2002, Ashanti upgraded the plant capacity to 4Mtpa and in 2009 the plant capacity was further extended to the current 5Mtpa.

#### Legal aspects and tenure

Iduapriem comprises the following mining leases:

- Iduapriem LVB1539/89 covering 31km<sup>2</sup> and expiring on 18 April 2019
- Ajopa North LVB/WR326/09 covering 48.34km<sup>2</sup> and expiring on the 5 January 2019
- Teberebie LVB3722H/92 covering 25.83km<sup>2</sup> and expired on 1 February 2018

All renewals had been suspended by the Regulator (the Minerals Commission), due to the ban on small scale mining. The Minerals Commission will resume working through the backlog and renew licence applications during the course of this year given that the ban was recently lifted.

A new Environmental Management Plan (EMP) has been submitted for the mining leases.

#### Mining method

Iduapriem is an open pit mine which makes use of contract miners. It uses conventional drill and blast, with truck and excavator load and haul.

#### Operational infrastructure

Surface infrastructure associated with Iduapriem's operation includes a primary crusher, overland conveyor, CIP processing plant next to the main office building, tailings storage facility and two camp areas for contractors and company employees. Tarkwa town is also adjacent to the tenement. Power is obtained from the national grid.

#### Mineral processing

The current processing plant treats free-milling material from open-cast mining, by a conventional crush-semi-autogenous ball milling circuit and leaching. Iduapriem operates a two stage crushing circuit consisting of a 54-75 primary gyratory crusher and two GP550 gyratory crushers for secondary crushing. The Iduapriem treatment plant has two semi-autogeneous grinding mills (SAG mills) and two ball mills which run in two parallel circuits, each with a SAG mill and a ball mill.

#### Risks

Power reliability and stability, slope/high wall stability (rockfall potential) and inrush/inundation (flooding of pits, tailing dams and infrastructure) are considered potential risks. Mitigation plans are in place to manage these risks.

An independent external Mineral Resource and Ore Reserve audit was undertaken in 2018 and found no fatal aw's in process or output.

#### Competent Persons

Responsibility

Competent Person

Professional  
organisation

Membership  
number

Relevant  
experience

Qualification

Mineral Resource

Charles Kusi-Manu

MAusIMM

205 238

28 years

BEng (Geological Engineering),

Postgraduate Certificate in

Geostatistics, MBA

Ore Reserve

Stephen Asante Yamoah MAusIMM

304 095

14 years

BSc Hons (Mining Engineering),

MSc (Mining Engineering)

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SECTION 3 / CONTINENTAL AFRICA

Map showing Iduapriem Mine infrastructure and licences with the total mining lease area shown in the top right-hand corner

Licences

Mining

Mine Infrastructure

Pits

Plant

ROM pad

Crusher

Stockpiles

Leach pad

TSF

Waste dumps

Settlements

Towns

Villages

Roads

Main

Secondary

Insert

Total mining lease area

Map zoomed in area

Plant centroid co-ordinates

2°02'38"W, 5°14'44"N

Total mining lease area

0

1

2

3km

0

2

4km

65

SECTION 3 / CONTINENTAL AFRICA

## IDUAPRIEM CONTINUED

### GEOLOGY

Iduapriem Mine is located within the Tarkwaian Group which forms part of the West African Craton that is covered to a large extent

by metavolcanics and metasediments of the Birimian Supergroup. In Ghana, the Birimian terrane consists of northeast-southwest

trending volcanic belts separated by basins and the Tarkwaian Group was deposited in these basins as shallow water deltaic

sediments. The Tarkwaian lithologies are considered to represent the erosion products that accumulated following the erosion of the

uplifted and deformed underlying Birimian rocks during the Eburnean orogeny. The basins (grabens) are believed to have formed as

a result of rifting, preferentially in the central parts of the Birimian volcanic belts. The Tarkwaian Group consists of a thick sequence

of clastic metasedimentary rocks which have undergone low grade regional metamorphism.

#### Deposit type

At Tarkwa, the entire Tarkwaian Group has been folded into a broad syncline and is locally referred to as the Tarkwa Syncline. The

Banket Series Formation comprises a sequence of individual quartz pebble conglomerates (Banket beds), breccia conglomerates

and metasandstones (also called quartzites and grits). All known gold mineralisation within the Banket Formation is associated

with the conglomerates and is found within the matrix that binds the pebbles together. Gold content is a function of the size and

amount (packing) of quartz pebbles present within a conglomeratic unit – the bigger and/or more pebbles present, the higher

the gold grade. The upper stratigraphic limit of the Banket Series Formation is marked by the hangingwall quartzite, siliceous

and metamorphosed sandstone of buff colour, which exhibits well-developed and characteristic trough- and cross-bedded

haematitic black sand banding. The hangingwall quartzite also contains thin discontinuous grit interbeds. Dykes and sills of doleritic

composition intrude the sedimentary sequence and frequently occur adjacent to complex structural zones. All gold mineralisation

generally occurs within four specific zones or reefs.

#### Mineralisation style

There are four recognised conglomerate reefs namely A, B, C and D which are equivalent to the Tarkwaian Sub-Basal, Basal (or

Main), Middle (or West) and Breccia Reefs respectively. The B and C reefs are oligomictic, and consist of well sorted conglomerates

and have been mined underground in some areas for over a century. The A and D reefs have a lower gold tenor and are polymictic

containing both well rounded and angular fragments.

#### Mineralisation characteristics

The gold is fine-grained, free milling and not associated with sulphides.

### EXPLORATION

Exploration during 2018 focused on Mineral Resource conversion drilling at Block 7 and 8, Ajopa and Block 5 extension with

exploration target drilling at Mile 5W and traverse drilling at the TSF target. A total of 12,775m was drilled, comprising 9,988m DD

and 2,787m RC.

Geochemical results from lease-wide samples collected at Teberebie and Ajopa Leases were received with encouraging results.

A new mining lease, Ajopa South West, was traced to be in the name of Ghanaian Australian Goldfields (GAG). The change of name was effected at the Mineral Commissions office to AngloGold Ashanti Iduapriem Limited and the renewal application was added to the three existing mining leases awaiting final approval from the government.

Drilling in Block 5 extension intersected conglomerate reefs both along strike and down dip. Drill holes completed from the drilling programme confirm the strike extension of the mineralisation. In all, 371m RC and 1,577m DD was drilled. Further to the north-

eastern portion of the target, drilling showed a reduction in the number of reefs along strike i.e. full reef packages A,B,C and D from

Block 5 pit margin gradually reduced to only one reef package along the 600m strike of the target.

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SECTION 3 / CONTINENTAL AFRICA

A typical Geological section of Block 7 and 8, elevation in metres relative to average mean sea level At Ajopa, sixteen holes were drilled totalling 819m RC and 3,029m DD. A total of 2,806 samples were generated from the drilling, including duplicates and were submitted to SGS and Intertek laboratories. Two of the holes completed in the area at the start of the drilling programme were for grade control to test reef duplications as well as down-dip extension of modelled reefs. Four of the Mineral Resource drill holes were also attributed to sterilization and backfill projects. Sedimentological logs revealed well-packed and well-sorted conglomerate reefs of C and B with sub- to well-rounded quartz pebbles with gold association beneath the planned backfill pit limit.

The PFS drilling over the Block 7 and 8 area was undertaken during first half of the year, yielding 1,117m of samples by RC drilling and 3,521m by DD. In all, 1,578 samples were submitted to the lab for gold analysis. All holes intersected the full conglomerate reef package.

The Mile 5W drilling campaign yielded a total of 1,861m diamond drilling with 1,354 samples submitted for gold analysis. Some interesting observations from the core include pink altered quartzite units with quartz veins and veinlets, disseminated pyrite and sporadic euhedral shaped pyrrhotites. The veins occur along the bedding with very few cross cut veins, all characterised by tourmaline. The veins themselves rarely contain sulphides, showing only trace amounts of carbonates and sericite. The TSF exploration drilling ended with a 10 hole RC drilling programme, totalling 480m. Some significant assays were reported.

The lithological units are mainly quartzites, with intercalated conglomeratic units.

Geochemical results from lease-wide soil samples collected at Teberebie and Ajopa Leases were received with encouraging results.

These will be reviewed and followed up with trenches in 2019.

The East Limb of Block 7 and 8 (near Johnson Mining) was inspected and may be tested for further exploration extensions.

#### PROJECTS

No major projects have recently been completed or are planned at Iduapriem. Geology projects planned include mine-wide

geochemical sampling, Mineral Resource drilling at Block 7 and 8, Ajopa and Block 5 extension.

#### Legend

D mineralised reef

C mineralised reef

B mineralised reef

A mineralised reef

Depleted pit

+1425

+1425

+1500

+1500

+1575

+1575

w

E

0

25

50

75

67

SECTION 3 / CONTINENTAL AFRICA



IDUAPRIEM CONTINUED  
MINERAL RESOURCE

Details of average drill hole spacing and type in relation to Mineral Resource classification

Category

Spacing m (-x-)

Type of drilling

Diamond

RC

Blasthole

Channel

Other

Measured

20 x 15

–

√

√

√

√

√

√

–

–

–

Indicated

50 x 75

–

–

–

Inferred

100 x 100

–

–

–

Grade/ore control

20 x 15

–

–

–

–

In general 200 x 200m drill hole spacing is used to define the extent and geometry of an anomaly. The majority of the Mineral

Resource area has been drill tested at a spacing of a 100 x 100m with the spacing closed up to 50 x 50m for the shallower,

Indicated Mineral Resource.

The appropriate grid for each phase is optimised for each project based on the geometry of the mineralisation and the geological

and grade continuity (using variogram modelling) and mining experience from the pits.

In some cases, the data spacing may be reduced where structural complexity is encountered. Apart from the major fault structures,

geological continuity is considered to be very good with the conglomerate reefs being laterally consistent and continuous.

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SECTION 3 / CONTINENTAL AFRICA

Inclusive Mineral Resource  
as at 31 December 2018

Category

Tonnes  
million

Grade  
g/t

Contained gold  
tonnes

Moz

Ajopa

Measured

–

–

–

–

Indicated

3.95

1.80

7.11

0.23

Inferred

0.49

2.31

1.14

0.04

Total

4.45

1.86

8.25

0.27

Block 1

Measured

–

–

–

–

Indicated

–

–

–

–

Inferred

0.23

1.69

0.39

0.01

Total

0.23

1.69

0.39

0.01

Block 3W

Measured

—

—

—

—

Indicated

6.83

1.17

7.99

0.26

Inferred

4.67

1.26

5.89

0.19

Total

11.50

1.21

13.88

0.45

Block 5

Measured

—

—

—

—

Indicated

5.15

1.19

6.10

0.20

Inferred

2.15

1.26

2.71

0.09

Total

7.30

1.21

8.82

0.28

Block 7 and 8 (other)

Measured

—

—

—

—

Indicated

34.26

1.61  
 55.03  
 1.77  
 Inferred  
 21.20  
 1.64  
 34.69  
 1.12  
 Total  
 55.46  
 1.62  
 89.72  
 2.88  
 Block 7 and 8 East cutback  
 Measured  
 -  
 -  
 -  
 -  
 Indicated  
 21.60  
 1.70  
 36.74  
 1.18  
 Inferred  
 0.12  
 1.29  
 0.15  
 0.00  
 Total  
 21.72  
 1.70  
 36.90  
 1.19  
 Stockpile (full grade ore)  
 Measured  
 2.74  
 0.88  
 2.41  
 0.08  
 Indicated  
 -  
 -  
 -  
 -  
 Inferred  
 -  
 -  
 -  
 -  
 Total

2.74  
 0.88  
 2.41  
 0.08  
 Stockpile (other)  
 Measured  
 –  
 –  
 –  
 –  
 Indicated  
 10.80  
 0.57  
 6.16  
 0.20  
 Inferred  
 2.76  
 0.68  
 1.88  
 0.06  
 Total  
 13.56  
 0.59  
 8.03  
 0.26  
 Stockpile (marginal ore)  
 Measured  
 0.59  
 0.66  
 0.39  
 0.01  
 Indicated  
 6.23  
 0.67  
 4.17  
 0.13  
 Inferred  
 –  
 –  
 –  
 –  
 Total  
 6.82  
 0.67  
 4.56  
 0.15  
 Iduapriem  
 Total  
 123.78  
 1.40  
 172.96

5.56

No geological discounts have been applied in the model. Dykes which sterilise mineralisation and faults which may offset

mineralisation are explicitly modelled.

Estimation

Geostatistical techniques are employed in the estimation of the Mineral Resource. 3D wireframes are built from all geological

information obtained from drill hole data, mapping of pits and geophysical data interpretations. Where appropriate these wireframes

are subdivided into the individual reef units that occur within a broad conglomerate package. Estimation is by ordinary kriging into

block sizes that range from 5 to 25m in the X and Y directions and between 6m and 12m in the Z direction depending on the reef

width and data spacing. Densities are allocated from appropriate test work conducted on drill hole samples. Grade and tonnages

are computed from these block models that are constrained within an optimised pit shell at the Mineral Resource reporting gold price.

Full grade ore and marginal stockpiles as well as Run of Mine (ROM) material are surveyed on a monthly basis to validate tonnage

measurements. Grade measurements on these stockpiles are based on RC grade control drilling from the individual pits mined.

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SECTION 3 / CONTINENTAL AFRICA

IDUAPRIEM CONTINUED

During recent years, historic stockpiles were drilled and estimated using geostatistical techniques. These stockpiles were reported as part of the Mineral Resource if material occurred above the economic cut-off grade at the Mineral Resource gold price.

The grade tonnage curve does not include stockpiles.

Exclusive Mineral Resource

as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

Iduapriem

Measured

–

–

–

–

Indicated

52.41

1.38

72.22

2.32

Inferred

28.86

1.56

44.98

1.45

Total

81.27

1.44

117.20

3.77

The exclusive Mineral Resource is the part of the Mineral Resource that was not converted to Ore Reserve. It is defined as the

Mineral Resource that is outside the current Ore Reserve designs, but inside the Mineral Resource shells and includes the Inferred

Mineral Resource within the Ore Reserve design. The exclusive Mineral Resource gives an indication of the future potential of the

deposit. This material could be converted to Ore Reserve with an increase in the gold price and favorable costs.

Exclusive Mineral

Resource also includes material within the pit between the Mineral Resource and Ore Reserve cut-offs.

Year-on-year changes include a decrease to the Mineral Resource as a result of depletion and increases as a result of cost and

exploration drilling reductions.

Year-on-year changes in Mineral Resource

Grade tonnage curve



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SECTION 3 / CONTINENTAL AFRICA

ORE RESERVE

Ore Reserve

as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

Ajopa

Proved

–

–

–

–

Probable

0.61

2.04

1.24

0.04

Total

0.61

2.04

1.24

0.04

Block 5

Proved

–

–

–

–

Probable

2.15

1.23

2.65

0.09

Total

2.15

1.23

2.65

0.09

Block 7 and 8 East cutback

Proved

–

–

–

–

Probable

21.48

1.68  
 36.03  
 1.16  
 Total  
 21.48  
 1.68  
 36.03  
 1.16  
 Stockpile (full grade ore)  
 Proved  
 2.74  
 0.88  
 2.41  
 0.08  
 Probable  
 -  
 -  
 -  
 -  
 Total  
 2.74  
 0.88  
 2.41  
 0.08  
 Stockpile (other)  
 Proved  
 -  
 -  
 -  
 -  
 Probable  
 5.26  
 0.74  
 3.88  
 0.12  
 Total  
 5.26  
 0.74  
 3.88  
 0.12  
 Stockpile (marginal ore)  
 Proved  
 -  
 -  
 -  
 -  
 Probable  
 6.89  
 0.67  
 4.62  
 0.15

Total

6.89

0.67

4.62

0.15

Iduapriem

Total

39.13

1.30

50.83

1.63

Estimation

The 3D Mineral Resource models are used as the basis for the Ore Reserve. A mineralisation envelope is developed using the

Mineral Resource block model, geological information and the relevant cut-off grade, which is then used for mine design. An

appropriate mining layout is designed that incorporates mining extraction losses and dilution factors.

The Ore Reserve is estimated within mine designs, based on modifying factors, based on actual mining and detailed analysis of cut-

off grade, geotechnical, environmental, productivity considerations and the requirements of the mining eet. The upper portions of

the Ajopa deposit have been discounted for the estimated depletion by artisanal miners. This discount factor has been derived from

observation and estimates based on the Mineral Resource model.

*The Mineral Resource is highly sensitive to changes in gold price due to the high stripping cost and capital intensive cutbacks required to access the deeper portions of the orebody.*

Inclusive Mineral Resource sensitivity

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SECTION 3 / CONTINENTAL AFRICA

Ore Reserve modifying factors  
as at 31 December 2018

Gold

price

US\$/oz

Cut-off

grade

g/t Au

RMF

% (based  
on tonnes)

RMF

% (based  
on g/t)

MRF

% (based  
on tonnes)

MRF

% (based  
on g/t)

MCF

%

MetRF

%

Ajopa

1,100

0.90

100.0

100.0

100.0

96.0

100.0

95.9

Block 5

1,100

0.85

100.0

100.0

100.0

96.0

100.0

95.9

Block 7 and 8 East cutback

1,100

0.85

100.0

100.0

100.0

96.0

100.0

95.9

Stockpile (full grade ore)

1,100  
 0.75  
 100.0  
 100.0  
 100.0  
 100.0  
 100.0  
 93.0

Stockpile (marginal ore)

1,100  
 0.55  
 100.0  
 100.0  
 100.0  
 100.0  
 100.0  
 93.0

Stockpile (other)

1,100  
 0.60  
 100.0  
 100.0  
 100.0  
 100.0  
 100.0  
 93.0

A mining recovery factor (MRF) of 96.0% was applied to the standard orebody models by reducing all block grades by 4.0% and 100% mining tonnage factor, which are based on reconciliation over a three-year period.

Inferred Mineral Resource in business plan  
 as at 31 December 2018

Tonnes  
 million  
 Grade  
 g/t

Contained gold  
 tonnes

Moz  
 Ajopa  
 0.02  
 2.30  
 0.04  
 0.00

Block 5  
 0.03  
 1.45  
 0.05  
 0.00

Block 7 and 8 East cutback  
 0.12

1.25  
0.15  
0.00  
Total  
0.17  
1.39  
0.24  
0.01

Inferred Mineral Resource is included in the business plan. The overall Inferred Mineral Resource allowed for in the plan is around 9%. However, only Measured and Indicated Mineral Resource within the design of the selected pit shells are converted to Ore Reserve.

Year-on-year, the Ore Reserve was down as minor cost improvements failed to replace dilution.

IDUAPRIEM CONTINUED

Year-on-year changes in Ore Reserve

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SECTION 3 / CONTINENTAL AFRICA

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SECTION 3 / CONTINENTAL AFRICA



## OBUASI

### INTRODUCTION

#### Property description

Obuasi Gold Mine is owned and operated by AngloGold Ashanti Ghana Limited (AGAG). AGAG was established following the merger of the former AngloGold Limited of South Africa and Ashanti Goldfields Company Limited of Ghana in April 2004.

Production started in 1897 and stopped in the last quarter of 2014. Some aspects of the mine continued under limited operational conditions, including the development of the underground decline. A favourable FS was completed in 2017 and indicated a strong technical and economical case with an anticipated 20-year mine life. In 2018 approval was received from the AngloGold Ashanti board to proceed with the project with first gold planned for Q4 2019.

#### Location

Obuasi Gold Mine is located in the municipality of Obuasi, in the Ashanti region of Ghana, some 260km northwest of the capital Accra and 60km south of Kumasi.

#### History

Underground production was continuous from 1897 to 2014. A phase of open pit mining was conducted from 1988 to 2000 with small intermittent open pit mining beyond that period. Total historic production is ~33Moz gold, including ~5Moz gold from open pits.

#### Legal aspects and tenure

Obuasi gold mine concession previously covered an area of approximately 475km<sup>2</sup> and had 80 communities within a 30km radius of the mine. This was reduced to 201.46km<sup>2</sup> on 3 March 2016.

The majority of the reduced concession area falls in the Obuasi municipality.

Minor portions of the new concession fall in the Adansi North, Adansi South and Amansie Central districts.

The Obuasi Gold Mine Mineral Resource and Ore Reserve is covered by a number of mining leases, namely:

- Obuasi Concession comprising 152.6km<sup>2</sup>
- 

Binsere Concession parts 1, 2 and 3 comprising 48.86km<sup>2</sup>

The duration of the mining concessions, which expire on 5 March 2054, are covered by a stability agreement with the government of Ghana.

#### Mining method

Mine designs are done to delineate development layouts and production stopes by taking into consideration economic cut-off grade and geotechnical design parameters for each mining block, mining level and section. The underground development extends to a depth of 1,500m from surface. Mining levels lie between 15m and 20m intervals with major levels between 30m and 60m intervals. Underground production was by open-stope mining (both longitudinal and transverse), and sub-level caving method, with future designed production by longhole open-stope mining methods with paste II. Ore is transported to surface via shafts or trucked up the decline.

#### Operational infrastructure

Existing infrastructure includes a 2.4Mtpa processing plant with flotation and bacterial oxidation (BIOX), underground development, hoisting shafts and associated infrastructure, power and water reticulation, office complexes, workshops and company housing estates.

#### Mineral processing

The plant is configured for flotation and BIOX treatment that is required for the underground refractory sulphide ore type.

#### Risks

The Obuasi Mine is currently embarking on a Redevelopment Project that aims to establish Obuasi as a modern, efficient, mechanised, underground operation. This work is on-going with first gold scheduled for the end of 2019.

The current Ore Reserve has been estimated based partially on the 2014/2015 Mineral Resource and partially on the 2016/2017 Mineral Resource. Therefore, some of the significant changes to the Mineral Resource resulting from the revised geological model and extensive data validation have not yet rolled through to all parts of the Ore Reserve. This is seen as a small risk but is more likely to represent a potential upside to the Ore Reserve.

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SECTION 3 / CONTINENTAL AFRICA

Licences

Mining

Mine infrastructure

Pits

Plant

TSF

Waste dumps

Underground access

Ponds and dams

Consolidated operations footprint

Settlements

Towns

Villages

Roads

Main

Secondary

Airfield

0

2

4

6km

Plant centroid co-ordinates

1°41'16"W, 6°10'11"N

Map showing Obuasi Gold Mine infrastructure and licences

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SECTION 3 / CONTINENTAL AFRICA

OBUASI CONTINUED

Competent Persons

Responsibility

Competent Person

Professional

organisation

Membership

number

Relevant

experience

Qualification

Mineral Resource

Richard Peattie

MAusIMM

301 029

18 years

BSc Hons (Geology), MSc (Mineral

Resource Evaluation)

Ore Reserve

Wayne Emslie

MAusIMM

211 371

23 years

BEng Hons (Mining)

GEOLOGY

Deposit type

The mine is located within the Obuasi concession area in south-western Ghana along the north-easterly-striking Ashanti volcanic

belt. The deposit is one of the most significant Proterozoic gold belts discovered to date. The Ashanti belt predominantly comprises

sedimentary and mafic volcanic rocks, and is the most prominent of the ve Birimian Supergroup gold belts found in Ghana.

The Birimian was deformed, metamorphosed and intruded by syn- and post-tectonic granitoids during the Eburnean tectonothermal

event around two billion years ago. Folding trends are dominantly north-northeast to north-east. Elongate syn-Birimian basins

developed between the ridges of the Birimian system and these were filled with the Tarkwaian molasse sediments made up primarily

of conglomerates, quartzose and arkosic sandstones and minor shale units. Major faulting has taken place along the same trends.

The Lower Birimian metasediments and metavolcanics are characterised and defined by argillaceous and fine to intermediate

arenaceous rocks. These rocks are represented by phyllites, metasilstones, metagreywackes, tuffaceous sediments, ash tuffs

and hornstones in order of decreasing importance. Adjacent to the shear zones, these rocks are replaced by sericitic, chloritic and

carbonaceous schists, which may be graphitic in places. Multiple lodes are a common feature in the mine.

Granites outcrop in the west and north-west of the concession area and intrude the Birimian rocks only. Two types of granite are

present; one is more resistant to weathering than the other, with less-resistant granite being prospective for gold mineralisation.

Mineralised shears are found in close proximity to the contact with harder metamorphosed and metasomatically-altered intermediate to basic Upper Birimian volcanics. The competency contrast between the harder metavolcanic rocks to the east and the more argillaceous rocks to the west is thought to have formed a plane of weakness. During crustal movement, this plane became a zone of shearing and thrusting coeval with the compressional phases.

#### Mineralisation style

Gold mineralisation is associated with, and occurs within, graphite-chlorite-sericite fault zones. These shear zones are commonly associated with pervasive silica, carbonate and sulphide hydrothermal alteration and occur in tightly folded Lower Birimian schists, phyllites metagreywackes, and tuffs, along the eastern limb of the Kumasi anticlinorium.

#### Mineralisation characteristics

Two main ore types are present, namely quartz vein and sulphide ore. The quartz vein type consists mainly of quartz with free gold in association with lesser amounts of various metal sulphides containing iron, zinc, lead and copper. This ore type is generally non-

refractory. Sulphide ore is characterised by the inclusion of gold in the crystal structure of arsenopyrite minerals.

#### Higher gold grades

tend to be associated with finer grain arsenopyrite crystals. Sulphide ore is generally refractory.

#### EXPLORATION

No exploration was done during the year.

#### PROJECTS

In 2014, a detailed FS began that considered the optimum mining methodology and schedules for the underground mine, based

on modern mechanised mining methods and refurbishment of underground, surface and process plant infrastructure. It was

recognised that a significant rationalisation and/or replacement of current infrastructure will enable the delivery of high utilisation

and productivity metrics.

During this time Obuasi operated in a limited operating phase with underground activities essentially restricted to continued

development of the Obuasi deeps decline and underground infill drilling. The limited operating phase was brought to a halt after an

incursion by illegal miners on Obuasi's concession in February 2016. The mine has been under care and maintenance ever since.

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SECTION 3 / CONTINENTAL AFRICA

N-S Geological cross-section through Obuasi Block 8, elevation in mRL

Legend

Mineralised lodes

Footwall lode 6 (FW06)

Footwall lode 7 (FW07)

Hangingwall lode 1 (HW01)

Obuasi ssure (OF05)

Geology

Graphitic Schist

Metavolcanics

Shear Vein Quartz

HW/FW shears

Sulphide Ore Zone

11222N

11022N

10822N

-800RL

-600RL

-400RL

-200RL

0RL

200RL

10622N

10822N

11022N

11222N

200RL

0RL

-200RL

-400RL

-600RL

-800RL

N

S

0m

100m

Scale: 1:3,000

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SECTION 3 / CONTINENTAL AFRICA

OBUASI CONTINUED

The FS was finalised in March 2016, with a schedule for the potential restart of underground production. The FS was followed up

with an optimised FS that looked at reducing capital spend upfront. This was finalised at the end of 2017. In 2018 approval was

received from the AngloGold Ashanti board for project commencement.

Obuasi is currently embarking on the process of rebuilding the mine in all its aspects to deliver a modern, efficient, mechanised,

underground operation.

Underground development is scheduled to start in Q1 2019 with first gold forecast for the end of 2019.

MINERAL RESOURCE

Details of average drill hole spacing and type in relation to Mineral Resource classification

Category

Spacing m (-x-)

Type of drilling

Comments

Diamond

RC

Blasthole

Channel

Other

Measured

20 x 20

√

√

√

√

–

√

√

√

√

–

–

–

Indicated

60 x 60

–

–

–

–

Inferred

90 x 90, 120 x 120

–

–

√

–

–

Grade/ore control

10 x 10

–

—  
Channel sampling of  
cross-cuts

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SECTION 3 / CONTINENTAL AFRICA



Inclusive Mineral Resource  
as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

Anyankyirem

Measured

–

–

–

–

Indicated

5.52

2.38

13.10

0.42

Inferred

0.09

2.71

0.24

0.01

Total

5.61

2.38

13.35

0.43

Anyinam

Measured

0.00

2.50

0.01

0.00

Indicated

0.45

3.54

1.59

0.05

Inferred

1.02

4.23

4.32

0.14

Total

1.47

4.02

5.92

0.19  
Gyabunsu – Sibi  
Measured  
0.05  
4.00  
0.21  
0.01  
Indicated  
0.05  
3.48  
0.16  
0.01  
Inferred  
0.28  
3.97  
1.13  
0.04  
Total  
0.38  
3.92  
1.50  
0.05  
Above 50 Level – Block 1  
Measured  
–  
–  
–  
–  
Indicated  
10.29  
5.16  
53.10  
1.71  
Inferred  
2.04  
5.08  
10.36  
0.33  
Total  
12.33  
5.15  
63.46  
2.04  
Above 50 Level – Block 2  
Measured  
–  
–  
–  
–  
Indicated  
8.69

5.94  
51.61  
1.66  
Inferred  
2.83  
5.91  
16.72  
0.54  
Total  
11.52  
5.93  
68.32  
2.20  
Above 50 Level – Block 8  
Measured  
1.83  
4.46  
8.14  
0.26  
Indicated  
29.72  
5.65  
168.02  
5.40  
Inferred  
3.78  
5.75  
21.69  
0.70  
Total  
35.32  
5.60  
197.86  
6.36  
Above 50 Level – Block 10  
Measured  
–  
–  
–  
–  
Indicated  
21.20  
6.09  
129.08  
4.15  
Inferred  
5.06  
5.82  
29.49  
0.95  
Total

26.26

6.04

158.57

5.10

Above 50 Level – Adansi

Measured

–

–

–

–

Indicated

5.48

14.52

79.59

2.56

Inferred

1.81

14.31

25.89

0.83

Total

7.29

14.47

105.49

3.39

Above 50 Level – Côte d’Or

Measured

–

–

–

–

Indicated

0.01

18.03

0.19

0.01

Inferred

13.85

10.75

148.84

4.79

Total

13.86

10.76

149.03

4.79

Above 50 Level – Sansu

Measured

1.63

6.87

11.18

0.36  
Indicated  
9.27  
5.29  
49.04  
1.58  
Inferred  
2.61  
5.41  
14.09  
0.45  
Total  
13.51  
5.50  
74.31  
2.39  
Below 50 Level – Block 11  
Measured  
–  
–  
–  
–  
Indicated  
3.26  
21.51  
70.19  
2.26  
Inferred  
4.48  
17.15  
76.84  
2.47  
Total  
7.74  
18.99  
147.03  
4.73  
Below 50 Level – Block 14  
Measured  
–  
–  
–  
–  
Indicated  
1.50  
7.95  
11.96  
0.38  
Inferred  
8.30  
7.50

62.20

2.00

Total

9.80

7.56

74.16

2.38

Obuasi

Total

145.10

7.30

1,058.99

34.05

ESTIMATION

From 2016 to 2018, an exhaustive process of data review and validation took place, as well as capture of historic geological

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SECTION 3 / CONTINENTAL AFRICA

OBUASI CONTINUED

information. Together, this has considerably increased the confidence of the input data and supported a refinement of the Mineral

Resource models. The geological interpretation is based on DD, cross-cut sampling and underground mapping information. Block

models are estimated within the delineated mineralised ore zones using ordinary kriging. Estimates at Obuasi are based on a block

model comprised of 20 x 5 x 15m blocks, which approximates the minimum SMU for underground mining.

The open pit Mineral Resource at Obuasi was estimated by geostatistical techniques within 3D wireframe models of the

mineralisation. These models are based on geological information and cut-off boundaries defined by sampling results.

Geological

interpretation is based on trench sampling and RC and/or DD. Estimation is by ordinary kriging into 30 x 30 x 10m blocks for Obuasi

open pits.

Obuasi uses the 15% rule with 90% confidence to classify its Mineral Resource into Measured, Indicated and Inferred Mineral

Resource.

Exclusive Mineral Resource

as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

Obuasi

Measured

3.51

5.57

19.55

0.63

Indicated

78.76

5.65

445.28

14.32

Inferred

46.14

8.93

411.82

13.24

The exclusive Mineral Resource is made up of Mineral Resource from underground and open pit. The bulk of the exclusive Mineral

Resource is from underground, and is spread across the entire deposit, where further study and design, change in costs and/or

gold price is required to develop economic extraction plans.

37% of the exclusive Mineral Resource is Inferred Mineral Resource and will require upgrading of its confidence to be able to report

as an Ore Reserve.

Mineral Resource below infrastructure

as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

Obuasi

Measured

–

–

–

–

Indicated

4.77

17.23

82.15

2.64

Inferred

12.78

10.88

139.04

4.47

Total

17.55

12.61

221.19

7.11

Mineral Resource below infrastructure is from those areas below 50 Level. These areas have been extensively drilled but no

infrastructure is currently in place to exploit.

Grade tonnage curves

80

SECTION 3 / CONTINENTAL AFRICA



With no new mining or geological information collected during the year the Mineral Resource has remained constant from year to year.

Obuasi is very sensitive to changes in gold price, especially to a lower gold price, due to the lower grade sulphide mineralisation on the flanks of the high grade quartz.

Year-on-year changes in Mineral Resource  
Inclusive Mineral Resource sensitivity

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SECTION 3 / CONTINENTAL AFRICA

OBUASI CONTINUED

ORE RESERVE

Ore Reserve

as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

Above 50 Level – Block 1

Proved

–

–

–

–

Probable

0.91

6.49

5.91

0.19

Total

0.91

6.49

5.91

0.19

Above 50 Level – Block 2

Proved

–

–

–

–

Probable

1.35

6.08

8.22

0.26

Total

1.35

6.08

8.22

0.26

Above 50 Level – Block 8

Proved

–

–

–

–

Probable

7.24  
8.16  
59.04  
1.90  
Total  
7.24  
8.16  
59.04  
1.90  
Above 50 Level – Block 10  
Proved  
–  
–  
–  
–  
Probable  
6.42  
7.28  
46.73  
1.50  
Total  
6.42  
7.28  
46.73  
1.50  
Above 50 Level – Adansi  
Proved  
–  
–  
–  
–  
Probable  
0.74  
16.60  
12.36  
0.40  
Total  
0.74  
16.60  
12.36  
0.40  
Above 50 Level – Côte d’Or  
Proved  
–  
–  
–  
–  
Probable  
0.01  
16.47  
0.10

0.00  
 Total  
 0.01  
 16.47  
 0.10  
 0.00  
 Above 50 Level – Sansu  
 Proved  
 –  
 –  
 –  
 –  
 Probable  
 1.91  
 7.80  
 14.89  
 0.48  
 Total  
 1.91  
 7.80  
 14.89  
 0.48  
 Below 50 Level – Block 11  
 Proved  
 –  
 –  
 –  
 –  
 Probable  
 1.70  
 20.68  
 35.15  
 1.13  
 Total  
 1.70  
 20.68  
 35.15  
 1.13  
 Obuasi  
 Total  
 20.28  
 9.00  
 182.40  
 5.86

Estimation

3D Mineral Resource models are used as the basis for the Ore Reserve evaluation. Using the Mineral Resource block model, a mineralisation envelope is developed by applying the relevant cut-off grade, which is then used for a mine design. An appropriate mining layout is designed that incorporates mining extraction losses and dilution factors.

All mine designs are done to delineate stopes by taking into consideration cut-off grade, geotechnical design parameters for each mining block, ventilation and backfill requirement, mining level and section, usually leading to an optimisation of the existing infrastructure, mining sequence, and corresponding development layouts. The underground operation runs to a depth of 1,500m from surface. Mining levels are between 15m and 20m intervals with major levels between 30m and 60m intervals. Underground production mining methods include both longitudinal and transverse open stoping. The current Ore Reserve has been estimated based partially on the 2014/2015 Mineral Resource and partially on the 2016 Mineral Resource. The significant changes to the Mineral Resource, resulting from the revised geological model and extensive data validation, have not impacted the entire Ore Reserve with only the southern blocks re-designed to the 2016 Mineral Resource. The blocks re-designed during 2017 include: Sansu, Block 8 and Block 10 (includes Block 9). The remaining blocks will be redesigned during 2019.

Ore Reserve modifying factors

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as at 31 December 2018

Gold

price

US\$/oz

Cut-off

grade

g/t Au

Dilution

%

MRF

% (based

on tonnes)

MRF

% (based

on g/t)

MCF

%

MetRF

%

Above 50 Level – Adansi

1,100

5.20

14.0

98.0

100.0

100.0

87.0

Above 50 Level – Block 1

1,100

4.20

16.0

96.0

100.0

100.0

87.0

Above 50 Level – Block 2

1,100

4.30

15.0

96.0

100.0

100.0

87.0

Above 50 Level – Block 8

1,100

4.10

15.0

96.0

100.0

100.0

87.0

Above 50 Level – Block 10

1,100

4.25

10.0

96.0

100.0

100.0

87.0

Above 50 Level – Côte d'Or

1,100

5.00

5.0

100.0

100.0

100.0

87.0

Above 50 Level – Sansu

1,100

4.10

15.0

95.0

100.0

100.0

87.0

Below 50 Level – Block 11

1,100

5.20

16.0

96.0

100.0

100.0

87.0

Several factors are used for the modifying of the Ore Reserve and include mining recovery, dilution and processing recovery. These are applied based on the mining method employed. A weighted average dilution factor equal to 15.5% is for all of the Ore Reserve.

Inferred Mineral Resource in business plan

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OBUASI CONTINUED

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SECTION 3 / CONTINENTAL AFRICA



as at 31 December 2018

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

Above 50 Level – Block 1

0.01

6.36

0.09

0.00

Above 50 Level – Block 2

0.67

6.70

4.49

0.14

Above 50 Level – Block 8

0.54

5.96

3.23

0.10

Above 50 Level – Block 10

0.20

8.08

1.58

0.05

Above 50 Level – Adansi

0.09

8.01

0.72

0.02

Above 50 Level – Côte d’Or

2.55

6.66

17.01

0.55

Below 50 Level – Block 11

1.01

14.84

15.02

0.48

Total

5.08

8.30

42.13

1.35

With appropriate caution, a portion of the Inferred Mineral Resource was included in the business plan during the optimisation

process. This accounts for 20% of the business plan. The planned mining of Inferred Mineral Resource in the business plan is mainly at the end of the LOM and has an exploration programme attached to it to ensure the upgrade to Indicated Mineral Resource. This conversion of Inferred to Indicated Mineral Resource has taken into consideration historic conversion outcomes.

Ore Reserve below infrastructure  
as at 31 December 2018

Category  
Tonnes  
million  
Grade  
g/t  
Contained gold  
tonnes  
Moz  
Obuasi  
Proved  
–  
–  
–  
–

Probable  
1.70  
20.68  
35.15  
1.13  
Total  
1.70  
20.68  
35.15  
1.13

Ore Reserve below infrastructure is restricted to the ground below 50 Level that requires a decline to access and is located between

50 and 60 Level below the Kwesi Mensah Shaft (KMS).

No mining or redesign occurred in 2018 as the mine remained on care and maintenance. The Ore Reserve figure remains as it was in 2017.

Year-on-year changes in Ore Reserve

85

SECTION 3 / CONTINENTAL AFRICA

## GUINEA

Siguiri Gold Mine is AngloGold Ashanti's only operation in the Republic of Guinea. The mine is 85% owned by AngloGold Ashanti and 15% by the government of Guinea. The mine is a conventional open pit operation situated in the Siguiri-district in the north-east of Guinea. It lies about 850km north-northeast from the capital city of Conakry and 109km west of the border with Mali by road.

Gold-bearing ore is mined from several pits (generally three pits at any one time). The plant upgrade has been completed and will ramp up during 2019.

Guinea – Siguiri

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SECTION 3 / CONTINENTAL AFRICA

Inclusive Mineral Resource  
as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

Guinea

Measured

20.36

0.63

12.89

0.41

Indicated

164.46

0.87

143.58

4.62

Inferred

71.93

0.93

66.84

2.15

Total

256.75

0.87

223.30

7.18

Exclusive Mineral Resource

as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

Guinea

Measured

–

–

–

–

Indicated

97.67

0.87

85.03

2.73  
Inferred  
71.93  
0.93  
66.84  
2.15  
Total  
169.60  
0.90  
151.87  
4.88  
Ore Reserve  
as at 31 December 2018  
Category  
Tonnes  
million  
Grade  
g/t  
Contained gold  
tonnes  
Moz  
Guinea  
Proved  
21.54  
0.67  
14.40  
0.46  
Probable  
59.40  
0.84  
49.82  
1.60  
Total  
80.94  
0.79  
64.22  
2.06  
0  
200km  
LEGEND  
1  
Siguiri (85%)  
Operation  
87  
SECTION 3 / CONTINENTAL AFRICA

## SIGUIRI

### INTRODUCTION

#### Property description

Siguiri in Guinea is 85% owned by AngloGold Ashanti and 15% by the government of Guinea. It is an open pit operation.

#### Location

The mine is located approximately 850km north-northeast of Conakry, 25km northwest of the town of Siguiri and 190km southeast of the Malian capital Bamako, near the Mali border.

#### History

Gold mining in the district can be traced back for centuries, but there are no reliable records of pre-western production. The French became involved in the area in the late-19th and early-20th centuries. Between 1931 and 1951, the French reported gold coming out of Siguiri, with figures varying between 1t and 3.8t annually, however, little exploration work was completed.

There was a phase of Russian exploration in the area between 1960 and 1963 which focused on the placer deposits along the major river channels.

In 1980, Société Minière Internationale du Québec (SOMIQ) gained the exploration rights for Siguiri and Mandiana. SOMIQ focused its work on the Koron and Didi areas. The Chevaning Mining Company Limited was then created to undertake a detailed economic evaluation of the prospect, with more intensive work beginning in the late 1980s.

Société Aurifere de Guinea took over from its predecessors and continued work on the placer deposits. Production on the Koron placer reached a peak in 1992 with 1.1t of gold being produced. Due to a number of difficulties, the mine was shut down later that year. Golden Shamrock started a FS in 1995 after which Ashanti Goldfields invested in the deposit and Siguiri mine started production in 1998 as Société Ashanti Goldfields de Guinea (SAG).

The metallurgical plant is currently being upgraded to process hard rock and this is planned for completion in Q1 2019.

#### Legal aspects and tenure

Siguiri is mined under licence from the government of Guinea. The published Mineral Resource and Ore Reserve are covered by SAG mining concession D/97/171/PRG/SGG, totalling 1,494.5km<sup>2</sup>.

The original SAG concession was granted under the Convention de Base between the République de Guinea and SAG signed on 4 August 1997. The concession is to be explored and mined exclusively for gold, silver and diamonds by SAG for 25 years from the date of the agreement, until 4 August 2022. An updated concession was negotiated with the government in 2016.

The Convention de Base will guide the renewal of the mining concession in 2022. The SAG concession was granted under a new amended Convention de Base between the République de Guinea and SAG signed on 28 June 2016 and ratified by the Guinean parliament on 13 December 2016. The Convention de Base has been ratified by the constitutional court and published in the Journal Officiel of the Republic of Guinea on 24 January 2017. Dependent on the submission of the necessary renewal documentation on, or before, 4 March 2022 the concession is to be explored and mined exclusively for gold, silver and diamonds by SAG for 25 years from the date of agreement to 13 December 2041.

#### Mining method

Siguiri is currently a multi-pit oxide gold mining operation, operated by a contract miner. The mining method is selective conventional techniques using excavators and trucks on 3m high benches. Three Caterpillar 6020B excavators are the main loading equipment matched with CAT 777G dump trucks. A SMU suitable for selective mining and nominated mining equipment of 5 x 5 x 3m based on historical grade control areas are used to simulate the expected mining dilution and ore losses.

#### Operational infrastructure

The Siguiri Gold Mine includes a processing plant, a TSF and other infrastructure such as a mine village, water supply system, roads, power supply by on site generators and communications systems. Additional infrastructure includes on site offices, accommodation and workshops to

support remote mining.

Siguiri can be accessed via a small airfield and a well-paved road connects Siguiri to Bamako in the north and Kouroussa in the south. Access to the mine via roads and to Siguiri is easily passable through most of the year, although some secondary roads are seasonal with limited access during wet season.

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SECTION 3 / CONTINENTAL AFRICA

### Mineral processing

Processing of the ore is done by a CIP processing plant that has been successfully optimised to reach an average throughput of 11.8Mt per annum. Ore has historically been derived from a number of oxide pits in the Block 1 concession area with the primary future ore supply provided by existing stockpiles (oxide ore), Kami and Bidini (both fresh rock ore).

The original processing facility was designed for the processing of soft ore only and can only introduce a small percentage of fresh rock ore in the mill feed. A new ball mill and 3 stage crushing plant capable of treating 50% hard ores was added to the circuit in 2018. The leach circuit has also been converted to a hybrid CIL circuit.

### Risks

Risks associated with the validity of the Siguiri mining concession and mining convention post 2018, have been addressed by the favourable conclusion of the Convention de Base negotiation during 2016 and its ratification in 2017 by parliament. The current mining concession is confirmed to be valid until 4 August 2022, with high likelihood of renewal until 2041.

The favourable conclusion of the Convention de Base negotiation during 2016 and its ratification in 2017 by parliament has significantly reduced the risk of the remaining Mineral Resource and Ore Reserve not being covered by a valid mining concession. The current mining concession is now confirmed to be valid until 4 August 2022, with high likelihood of renewal until 2041.

Map showing Siguiri Gold Mine infrastructure, concession and exploration licences, Block 1 to Block 4

Licences

Mining

Exploration

Mine Infrastructure

Pits

Plant

ROM pad

Stockpiles

Leach pad

TSF

Waste dumps

Settlements

Towns

Villages

Deposit

Roads

Main

Secondary

0

10

20

30km

Plant centroid co-ordinates

9°23'27"W, 11°33'54"N

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SECTION 3 / CONTINENTAL AFRICA



SIGUIRI CONTINUED

Competent Persons

Responsibility

Competent Person

Professional

organisation

Membership

number

Relevant

experience

Qualification

Mineral Resource

Steven Robins

MAusIMM

222 533

22 years

BSc Hons (Geology), MSc (Mineral

Resource Evaluation), MBA

Ore Reserve

Desiderius Kamugisha

MAusIMM

227 181

17 years

BSc (Mining Engineering)

GEOLOGY

The Siguiri Gold Mine is situated in the northern part of the Siguiri Basin of Guinea, and is underlain by Lower Proterozoic rocks

of the Birimian metasedimentary and volcano-sedimentary formations. Where exposed, the sediments consist of a well-bedded

turbiditic sequence of greenschist facies siltstones, sandstones, greywackes and minor conglomerates, with some brecciated and

possibly volcanic members. Stratigraphic relationships in the area are however, poorly understood due to poor exposure and a thick

lateritic duricrust.

The typical regolith or laterite residual profile at Siguiri consists of four main sub-horizontal layers:

- Lateritic duricrust: a hard ferruginous (and aluminous) crust
- Mottled zone: a bauxite clay zone, produced by isovolumetric weathering, containing lateritic and gibbsitic nodules and accumulations which impart a mottled appearance
- Saprolite: a generally clay rich zone of weathered rock, composed of mixtures of kaolinite, hematite and/or goethite and/or gibbsite. Although more than 20% of weatherable minerals are altered, primary fabrics are often preserved
- Saprock/transition zone: slightly weathered rock with less than 20% of weatherable minerals altered

Map showing Siguiri Gold Mine infrastructure, concession and exploration licences, Block 1

0

2

4

8km  
Plant centroid co-ordinates  
9°23'27"W, 11°33'54"N  
Licences  
Mining  
Exploration  
Mine Infrastructure  
Pits  
Plant  
ROM pad  
Stockpiles  
Leach pad  
TSF  
Waste dumps

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SECTION 3 / CONTINENTAL AFRICA

The main structural and lithological trend in the current mining area of Block 1, changes from a roughly north-south orientation in the south to northwest-southeast in the north.

The mineralisation at Siguiri occurs as a secondary gold in alluvial or colluvial gravel in lateritic cover and a primary vein hosted mineralisation. The veins are quartz dominant and display a variety of styles and orientations, with a sub-vertical northeast-trending conjugate quartz vein set predominating in most of the open pits, irrespective of the orientation of the bedding.

Auriferous quartz

veins show a strong lithological control and are best developed in the sandstone/greywacke units.

The geology of Block 2 differs from Block 1 in that the block is mostly underlain by metavolcanics and volcanoclastics. Mineralisation

styles appear to be similar to those in Block 1, with Saraya appearing to be located on a north-south orientated structure.

Deposit type

The Siguiri orebodies are early Proterozoic (Birimian) orogenic quartz-vein hosted deposits located in the Siguiri Basin of West

Africa. Generally poorly exposed, the basin sediments have been subject to greenschist facies metamorphism and consist of a

well-bedded turbiditic sedimentary sequence with some brecciated and possibly volcanic members. Mineralisation also occurs as

secondary gold in alluvial and colluvial gravels in laterite cover.

Three main sedimentary packages are recognised in the Siguiri district, the Balato, Fatoya and Kintinian Formations.

The Balato

Formation is dominated by centimetre scale alternations of shale-siltstone and greywacke. The overlying Fatoya Formation consists

of metre scale beds of greywacke ning towards the west.

The Kintinian Formation is a thick package of shale and sandstone with a basal clast-supported conglomerate.

The orebodies are structurally controlled and the area has undergone at least three distinct phases of deformation, with initial

north-south compression developing minor folds, the second and largest deformation event is associated with east-west to east-

northeast-west-southwest directed compression leading to north-south structural architecture, and the third event was a northwest-

southeast compression that led to refolding of existing structures.

A deep oxidation (weathering) profile is developed in the region, varying between 50 to 150m. The mineralised saprolite currently

provides the main oxide feedstock for the CIP processing plant although a new treatment option is nearing completion to process

the fresh rock extensions of the ore deposits.

Mineralisation style

Primary gold mineralisation occurs in all three lithostratigraphic units of the Siguiri region although most of the known mineralisation

is found in the central and more competent Fatoya Formation. In some deposits, the mineralisation shows strong lithological control

and is preferentially developed in coarser-grained units that have higher fracture/vein densities relative to fine-grained rocks.

The mineralisation dominantly follows sub-vertical north-south thrusts, northeast-southwest dextral shear zones, and west-

northwest to east-southeast sinistral faults associated with the main (D2) deformation event. The mineralised veins are remarkable

for the relative consistency of their orientation (northeast), despite the highly variable orientation of bedding and major structures.

Mineralised veins are more intensely developed along major structural trends with quartz-carbonate-sulphide veining developed

along structures. Some of these structures have developed as incipient faults and are represented by discrete stockworks of

mineralised quartz-carbonate veins occurring along a trend, instead of being clearly defined continuous structures.

Mineralisation characteristics

Two styles of primary mineralisation have been recognised at Siguiri. The first is characterised by precipitation of gold-bearing pyrite

associated with proximal albite and distal carbon alteration, and opening of carbonate-pyrite veins. The second style corresponds

to east-northeast to west-southwest trending native gold bearing quartz veins with carbonate selvages which crosscut carbonate-

pyrite veins and show arsenopyrite (pyrite) halos.

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SECTION 3 / CONTINENTAL AFRICA

SIGUIRI CONTINUED  
EXPLORATION

Exploration at Siguiri was historically focused on finding new oxide Mineral Resource in the saprolite and upgrading the confidence

in the existing oxide Mineral Resource. This was achieved using geophysics, soil geochemistry and drill hole sampling in the context

of the regional and pit-scale geological models. Following the completion of an asset strategy optimisation project in 2012, which

indicated the potential economic viability of the fresh rock material, the aim of the exploration has expanded and the objectives are

two-fold. Firstly, to explore for replacement and additional oxide material for short-term mining requirements.

Secondly, to increase

the level of confidence in the five major fresh rock targets below the existing oxide pits at Kami, Bidini, Tubani, Séguélé, Sokunu

and Sintroko.

1,504 drill holes totalling 87,013m were completed in 2018 and primarily focused (51%) on increasing confidence in the Saraya, and

Foulata Mineral Resource to generate Indicated Mineral Resource in support of the Remote Lease PFS project at Block 2.

Infill drilling comprising 23% of the total drilling occurred on Block 1 over various deposits (Kami, Tubani, Silakoro, Sintroko, Kozan

North Bidini West and Eureka North). Reconnaissance drilling comprised 19% of the total metres and was focused on depth

extensions at Segué, Sokunu, and Kosise, while new oxide targets were drilled at Foulata East (Block 2) and the Saraya West,

Corridor and TSF Exploration Licences. The remaining 7% of total metres comprised sterilisation drilling at Silakoro. Target generation and evaluation of Block 4, was completed during 2018 and an AC reconnaissance drill programme initiated in

December 2018.

W-E Geological cross-section of the Kami deposit, elevation in metres relative to average mean sea level

PROJECTS

A FS to allow the exploitation of the fresh rock material was completed in December 2015. Called the combination plant project, it

will upgrade the current plant and enable processing of a combination of oxides and fresh rock material. The plant throughput will

remain at 12Mtpa with a flexible design allowing up to 6Mtpa fresh rock material to be processed. Targeted fresh rock pits include

Kami, Bidini, Tubani, Sintroko, Segué and Sokuno. The FS was approved by the board of AngloGold Ashanti following successful

negotiations with the government of Guinea regarding the Convention de Base and having obtained access to Segué Area 1.

Construction of the combination plant commenced in 2017 and will be completed during Q1 of 2019.

Fatoya Formation – coarse/medium

grained greywacke dominant

Fatoya Formation – fine grained

siltstone dominated

Balato Formation –

fine grained siltstone, shale, black shale

Orebody

Fault

Fold axis

Oxide – fresh rock transition

Legend

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SECTION 3 / CONTINENTAL AFRICA

Conceptual studies were initiated to evaluate the potential of mining in Block 2 and Block 3 with priority placed on the higher value

Block 2 deposits. Infill drilling, aimed to convert Inferred to Indicated Mineral Resource was completed at Foulata and Saraya in

2018, culminating in the start of a PFS in the second half of 2018 and completion in early 2019.

MINERAL RESOURCE

Details of average drill hole spacing and type in relation to Mineral Resource classification

Category

Spacing m (-x-)

Type of drilling

Comments

Diamond

RC

Blasthole

Channel

Other

Measured

–

√

√

√

√

√

√

√

–

–

–

–

Indicated

25 x 25 (square or staggered) and 50 x 25

(Kami and Bidini)

–

–

–

–

Inferred

20 x 40, 50 x 25, 50 x 50

–

–

–

–

Grade/ore control

5 x 10, 5 x 12, 10 x 5,

10 x 10, 13 x 7, 13 x 8

–

–

–

Variable

dependent

on the deposit  
and continuity of  
mineralisation

In general, 100 x 200m drill hole spacing is used to define the extent and geometry of anomalies.

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SECTION 3 / CONTINENTAL AFRICA



SIGUIRI CONTINUED

Inclusive Mineral Resource

as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes

Moz

Bidini (fresh rock)

Measured

–

–

–

–

Indicated

8.02

1.44

11.57

0.37

Inferred

1.95

1.39

2.70

0.09

Total

9.97

1.43

14.27

0.46

Bidini (oxide)

Measured

–

–

–

–

Indicated

3.15

0.90

2.84

0.09

Inferred

7.30

0.82

6.00

0.19

Total

10.45

0.85

8.83  
0.28  
Bidini (transitional)

Measured

—  
—  
—  
—

Indicated

3.63  
1.48  
5.37  
0.17

Inferred

0.76  
1.46  
1.10  
0.04

Total

4.39  
1.47  
6.47  
0.21

Eureka East

Measured

—  
—  
—  
—

Indicated

0.69  
0.92  
0.63  
0.02

Inferred

0.23  
0.77  
0.18  
0.01

Total

0.92  
0.88  
0.81  
0.03

Eureka North

Measured

—  
—  
—  
—

Indicated

1.63  
0.85  
1.38  
0.04  
Inferred  
0.97  
1.06  
1.03  
0.03  
Total  
2.60  
0.93  
2.41  
0.08  
Foulata  
Measured  
—  
—  
—  
—  
Indicated  
3.83  
1.31  
5.02  
0.16  
Inferred  
0.59  
1.50  
0.88  
0.03  
Total  
4.42  
1.34  
5.90  
0.19  
Kalamagna  
Measured  
—  
—  
—  
—  
Indicated  
5.90  
0.71  
4.17  
0.13  
Inferred  
2.66  
0.68  
1.79  
0.06

Total  
8.56  
0.70  
5.96  
0.19  
Kami (fresh rock)  
Measured  
—  
—  
—  
—  
Indicated  
35.21  
0.96  
33.63  
1.08  
Inferred  
4.42  
0.86  
3.79  
0.12  
Total  
39.62  
0.94  
37.42  
1.20  
Kami (oxide)  
Measured  
—  
—  
—  
—  
Indicated  
14.60  
0.61  
8.87  
0.29  
Inferred  
3.00  
0.66  
1.98  
0.06  
Total  
17.60  
0.62  
10.85  
0.35  
Kami (transitional)  
Measured  
—  
—

—  
—  
Indicated  
2.59  
0.97  
2.53  
0.08  
Inferred  
0.31  
0.79  
0.24  
0.01  
Total  
2.90  
0.96  
2.77  
0.09  
Kosise  
Measured  
—  
—  
—  
—  
Indicated  
4.55  
0.70  
3.19  
0.10  
Inferred  
3.37  
0.62  
2.10  
0.07  
Total  
7.93  
0.67  
5.30  
0.17  
Kounkoun  
Measured  
—  
—  
—  
—  
Indicated  
—  
—  
—  
—  
Inferred  
9.53

1.28

12.19

0.39

Total

9.53

1.28

12.19

0.39

Kozan North

Measured

—

—

—

—

Indicated

5.10

0.67

3.42

0.11

Inferred

0.57

0.69

0.39

0.01

94

SECTION 3 / CONTINENTAL AFRICA

Inclusive Mineral Resource continued  
as at 31 December 2018

Category

Tonnes  
million

Grade

g/t

Contained gold

tonnes

Moz

Total

5.67

0.67

3.81

0.12

Kozan South

Measured

–

–

–

–

Indicated

6.53

0.63

4.14

0.13

Inferred

0.34

0.92

0.31

0.01

Total

6.87

0.65

4.45

0.14

Seguélén (oxide)

Measured

–

–

–

–

Indicated

6.01

0.84

5.05

0.16

Inferred

2.09

0.76

1.59

0.05  
Total  
8.11  
0.82  
6.64  
0.21  
Seguélén (sulphide)  
Measured  
—  
—  
—  
—  
Indicated  
1.56  
1.08  
1.70  
0.05  
Inferred  
1.95  
1.06  
2.08  
0.07  
Total  
3.52  
1.07  
3.77  
0.12  
Seguélén (transitional)  
Measured  
—  
—  
—  
—  
Indicated  
0.72  
0.95  
0.68  
0.02  
Inferred  
0.48  
1.03  
0.49  
0.02  
Total  
1.19  
0.98  
1.17  
0.04  
Saraya (sulphide)  
Measured  
—



—  
—  
—  
Indicated  
3.43  
1.93  
6.61  
0.21  
Inferred  
1.18  
2.29  
2.69  
0.09  
Total  
4.61  
2.02  
9.31  
0.30  
Saraya (oxide)  
Measured

—  
—  
—  
—

Indicated  
2.02  
1.54  
3.12  
0.10  
Inferred  
0.50  
1.65  
0.82  
0.03  
Total  
2.52  
1.56  
3.94  
0.13  
Saraya (transitional)  
Measured

—  
—  
—  
—

Indicated  
0.24