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

CONTENTS

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
Houses the full suite of 2018 reports together with supplementary information
All these reports are available online at 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 molydenum 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

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

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SECTION 1 / INTRODUCTION

CONTENTS

INTRODUCTION

Ghana – Obuasi

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.

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	Local prices of gold			
	US$/oz	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).

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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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

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
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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	Contained copper 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	Contained copper 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
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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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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	Exploration	Methodology	Gold price	Cost	Geotechnical	Metallurgical	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
–

Gramalote
3.07
–
–
–
–
–
–
–
–
–
La Colosa
28.33
–
–
–
–
–
–
–
–
–
Quebradona
5.66
–
–
(0.25)
–
–
–
–
0.24
0.08
Total
56.94
(0.95)
0.11
0.76
–
0.47
(0.13)
–
0.19
0.08
Grand total
208.16
(4.01)
3.16
1.31
–
(0.20)

(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
16
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.
Annual depletions from Sulphur Paydam, East TSF and South East Extension.
2.18
(0.07)
(3)
Normal depletions from Harties 1 & 2 TSFs. Evaluation model grade adjustment for Harties 1 done on remainder of material.
0.62
(0.05)
(7)
Normal depletions from Mponeng and Savuka low grade stockpiles and Old North TSF.
46.18
(3.79)
(8)
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.
51.79
(24.10)
(32)
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 undergound.
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)
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SECTION 1 / INTRODUCTION

GROUP OVERVIEW CONTINUED

Reconciliation of Ore Reserve (gold content Moz)
as at 31 December 2018

	Previous year	Depletion	Exploration	Methodology	Gold price	Cost	Geotechnical	Metallurgical	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)

0.20
–
–
0.02
–
–
–
0.06
Iduapriem
1.85
(0.33)
–
–
–
0.04
(0.01)
–
–
0.08
Obuasi
5.86
–
–
–
–
–
–
–
–
–
Siguiri
2.24
(0.24)
0.03
–
–
0.07
0.02
–
(0.00)
(0.06)
Morila
0.08
(0.04)
0.02
(0.00)
–
–
0.00
–
–

(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
–
–
–
–
–
–
–
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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 Seguélén, 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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SECTION 1 / INTRODUCTION

SOUTH AFRICA
CONTENTS

Pretoria
LEGEND
1
West Wits operations
Includes Mponeng
and West Wits Surface
Operations
2
Vaal River operations
Includes MWS and
Vaal River Surface
Operations
CONTENTS
Regional overview
21
Mponeng
24
Surface Operations
36

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. Stoping 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

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^2
- GP30/5/1/2/2(11)MR valid from 11 July 2006 to 1 July 2016, covering 0.3km^2 (application for extension pending)
- GP30/5/1/2/2(248)MR valid from 16 October 2012 to 15 October 2022, covering 1.96km^2

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.

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
SECTION 2 / SOUTH AFRICA

MPONENG CONTINUED
26
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 Booysens 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, spahelerite 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

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^2 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 RESOURCEDETAIL 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

MPONENG CONTINUED
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SECTION 2 / SOUTH AFRICA

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

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

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

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 fiotation 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 Khotsong 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.

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

37

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	Mmatseleng 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.

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
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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

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

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

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.

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

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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
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^2. 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 otation 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

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_2O-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.

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
56
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.

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.

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 undergound.

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

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
63
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^2 and expiring on 18 April 2019
- Ajopa North LVB/WR326/09 covering 48.34km^2 and expiring on the 5 January 2019
- Teberebie LVB3722H/92 covering 25.83km^2 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 aws 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)
64
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.

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 pyrrotites. 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.

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

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

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^2 and had 80 communities within a 30km radius of the mine. This was reduced to 201.46km^2 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^2
- Binsere Concession parts 1, 2 and 3 comprising 48.86km^2

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 ll. 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.

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
75
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, metasiltstones, 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
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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

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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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

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

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 Quebéc (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 dif culties, 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^2.

The original SAG concession was granted under the Convention de Base between the Republique 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 Republique 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 itches. 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.

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.

SIGUIRI CONTINUED

EXPLORATION

Exploration at Siguiri was historically focused on nding 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 ve major fresh rock targets below the existing oxide pits at Kami, Bidini, Tubani, Ségulén, 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 Seguélén, 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 exible design allowing up to 6Mtpa fresh rock material to be processed. Targeted fresh rock pits include Kami, Bidini, Tubani, Sintroko, Seguélén 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 Seguélén 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 – ne grained siltstone, shale, black shale

Orebody

Fault

Fold axis

Oxide – fresh rock transition
Legend
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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
2.07
0.49
0.02
Inferred

0.03
1.88
0.07
0.00
Total
0.27
2.05
0.56
0.02
Sintroko South
Measured
–
–
–
–
Indicated
2.70
1.19
3.21
0.10
Inferred
0.34
1.85
0.63
0.02
Total
3.04
1.26
3.84
0.12
Silakoro
Measured
–
–
–
–
Indicated
1.25
1.73
2.16
0.07
Inferred
0.03
1.03
0.03
0.00
Total
1.27
1.72
2.19
0.07

Sokunu
Measured
–
–
–
–
Indicated
7.78
0.75
5.86
0.19
Inferred
5.84
0.88
5.11
0.16
Total
13.62
0.81
10.98
0.35
Soloni
Measured
–
–
–
–
Indicated
4.32
0.56
2.44
0.08
Inferred
3.94
0.67
2.64
0.08
Total
8.26
0.62
5.08
0.16
Sorofe (fresh rock)
Measured
–
–
–
–
Indicated
2.06
1.19

2.45
0.08
Inferred
1.39
1.38
1.92
0.06
Total
3.46
1.26
4.37
0.14
Sorofe (oxide)
Measured
–
–
–
–
Indicated
4.14
1.15
4.78
0.15
95
SECTION 3 / CONTINENTAL AFRICA

SIGUIRI CONTINUED
Inclusive Mineral Resource continued
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
Inferred
3.26
1.20
3.92
0.13
Total
7.40
1.18
8.70
0.28
Sorofe (transitional)
Measured
–
–
–
–
Indicated
0.83
1.18
0.98
0.03
Inferred
1.53
1.66
2.54
0.08
Total
2.36
1.49
3.52
0.11
Stockpile (full grade ore)
Measured
6.74
0.90
6.06
0.19
Indicated
–
–

–
–
Inferred
–
–
–
–
Total
6.74
0.90
6.06
0.19
Stockpile (marginal ore)
Measured
13.62
0.50
6.83
0.22
Indicated
–
–
–
–
Inferred
–
–
–
–
Total
13.62
0.50
6.83
0.22
Stockpile (spent heap leach)
Measured
–
–
–
–
Indicated
31.95
0.54
17.29
0.56
Inferred
13.40
0.57
7.61
0.24
Total
45.35

0.55
24.90
0.80
Siguiri
Total
256.75
0.87
223.30
7.18
The Siguiri inclusive Mineral Resource is reported above the mineralised waste cut-off within economic pit shells, based on a gold
price of $1,400/oz and considering mining, processing and operational costs.
Estimation
Mineral Resource definition drilling is done with aircore drilling (AC), RC and DD. All available geological drill hole information is
validated for use in the Mineral Resource models and together with the local geology of the deposit, an understanding of grade
variability is used to categorise the drill hole information into appropriate estimation domains. Detailed statistical analyses are
conducted on each of these domains and this allows for the identification of high-grade outlier values.
The Mineral Resource model is estimated using ordinary kriging into a 3D block model. Geological interpretation is based on
geological drill hole data. The dimensions of these Mineral Resource blocks range from 10 x 10 x 2.5m to 50 x 25 x 6m block sizes,
guided by the shape of the deposit and the drilling density. The Mineral Resource is declared within an optimised Mineral Resource
pit shell using a gold price of $1,400/oz.
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SECTION 3 / CONTINENTAL AFRICA

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
Siguiri	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

The exclusive Mineral Resource at Siguiri includes:

- Indicated Mineral Resource that is economic at the Mineral Resource gold price of US$1,400/oz but not at the Ore Reserve price (this material forms approximately one third of the exclusive Mineral Resource)
- Inferred Mineral Resource not included in the current pit designs (selected parts of these areas will be included in infill drilling programmes during 2019 to meet LOM planning requirements)
- Inferred Mineral Resource located within the Ore Reserve optimised pit shell (this material forms an insignificant proportion of the exclusive Mineral Resource)

Grade tonnage curve

The Mineral Resource has remained relatively stable over the past year with only a 1% decrease on that reported in 2017. Depletion at Seguélén, Silakoro, Kozan and stockpiles were offset by gains due to reduced cost which brought back Eureka North, exploration

infill drilling at Foulata, Saraya and Silakoro and metallurgical improvements due to the introduction of the CIL option for Foulata
and Saraya.
Year-on-year changes in Mineral Resource
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SECTION 3 / CONTINENTAL AFRICA

SIGUIRI CONTINUED

As a low grade deposit, Siguiri is very sensitive to gold price changes.

Inclusive Mineral Resource sensitivity

ORE RESERVE
Ore Reserve
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
Bidini (fresh rock)
Proved
–
–
–
–
Probable
4.74
1.43
6.78
0.22
Total
4.74
1.43
6.78
0.22
Bidini (oxide)
Proved
–
–
–
–
Probable
1.92
0.84
1.61
0.05
Total
1.92
0.84
1.61
0.05
Bidini (transitional)
Proved
–
–
–
–
Probable
1.82

1.39
2.53
0.08
Total
1.82
1.39
2.53
0.08
Kami (fresh rock)
Proved
–
–
–
–
Probable
15.41
1.14
17.55
0.56
Total
15.41
1.14
17.55
0.56
Kami (oxide)
Proved
–
–
–
–
Probable
0.73
0.78
0.57
0.02
Total
0.73
0.78
0.57
0.02
Kami (transitional)
Proved
–
–
–
–
Probable
1.21
1.14
1.38
0.04

Total
1.21
1.14
1.38
0.04
Seguélén (sulphide)
Proved
–
–
–
–
Probable
0.50
1.11
0.56
0.02
Total
0.50
1.11
0.56
0.02
Seguélén (transitional)
Proved
–
–
–
–
Probable
0.00
0.76
0.00
0.00
Total
0.00
0.76
0.00
0.00
Silakoro
Proved
–
–
–
–
Probable
0.40
2.04
0.81
0.03
Total
0.40
2.04

0.81
0.03
Sorofe (fresh rock)
Proved
1.18
1.28
1.51
0.05
Probable
–
–
–
–
Total
1.18
1.28
1.51
0.05
Sorofe (oxide)
Proved
–
–
–
–
Probable
0.46
0.99
0.45
0.01
Total
0.46
0.99
0.45
0.01
Sorofe (transitional)
Proved
–
–
–
–
Probable
0.24
1.18
0.29
0.01
Total
0.24
1.18
0.29
0.01
Stockpile (full grade ore)

Proved
6.74
0.90
6.06
0.19
Probable
–
–
–
–
Total
6.74
0.90
6.06
0.19
Stockpile (marginal ore)
Proved
13.62
0.50
6.83
0.22
Probable
–
–
–
–
Total
13.62
0.50
6.83
0.22
Stockpile (spent heap leach)
Proved
–
–
–
–
Probable
31.95
0.54
17.29
0.56
Total
31.95
0.54
17.29
0.56
Siguiri
Total
80.94
0.79

64.22
2.06
99
SECTION 3 / CONTINENTAL AFRICA

SIGUIRI CONTINUED

Estimation

The Mineral Resource models for each pit are depleted to the current mined-out surface. Costs are assigned on a pit-by-pit basis, reflecting the existing cost structure of the operation. The relevant dilution and ore-loss factors are applied and pit optimisation is then performed. The relevant modifying factors such as metallurgical recoveries, geotechnical parameters, cut-off grades and economics are applied to generate the mine designs that are used to estimate the final Ore Reserve.

Ore Reserve modifying factors
as at 31 December 2018

	Gold price US$/oz	Cut-off grade g/t Au	Dilution %	Dilution g/t	RMF % (based on tonnes)	RMF % (based on g/t)	MRF % (based on tonnes)	MRF % (based on g/t	MCF %	MetRF %
Bidini (oxide)	1,100	0.6	28.1	0.2	100.0	100.0	80.6	88.0	100.0	93.0
Bidini (fresh rock)	1,100	0.7								

17.6
0.1
100.0
100.0
85.5
91.3
100.0
93.0
Bidini (transitional)
1,100
0.7
18.1
0.1
100.0
100.0
83.1
89.6
100.0
93.0
Kami (oxide)
1,100
0.6
1.0
0.4
100.0
100.0
80.9
78.9
100.0
93.0
Kami (fresh rock)
1,100
0.7
1.5
0.5
100.0
100.0
99.0
99.3
100.0
93.0
Kami (transitional)
1,100
0.7
2.6
0.5
100.0
100.0
88.5
89.3
100.0

93.0
Seguélén (sulphide)
1,100
0.7
14.6
0.3
100.0
100.0
99.4
99.7
100.0
93.0
Seguélén (transitional)
1,100
0.7
14.6
0.3
100.0
100.0
92.8
95.8
100.0
93.0
Silakoro
1,100
0.6
2.4
0.4
100.0
100.0
76.5
74.3
100.0
91.0
Sorofe (oxide)
1,100
0.6
37.3
0.1
100.0
100.0
75.5
86.4
100.0
93.0
Sorofe (fresh rock)
1,100
0.7
12.6
0.1
100.0

100.0
86.7
92.1
100.0
93.0
Sorofe (transitional)
1,100
0.7
22.9
0.1
100.0
100.0
76.1
84.8
100.0
93.0
Stockpile (full grade ore)
1,100
–
–
–
100.0
100.0
100.0
100.0
100.0
91.0
Stockpile (marginal ore)
1,100
–
–
–
100.0
100.0
100.0
100.0
100.0
88.0
Stockpile (spent heap
leach)
1,100
–
–
–
100.0
100.0
100.0
100.0
100.0
90.0

The Mineral Resource models were modified to include the expected mining dilution and ore losses. These are built into the Mineral Resource block model prior to pit optimisation. Additional modifying factors based on historical information were also applied prior to estimation of Ore Reserve.

Positive model changes in the Ore Reserve from infill drilling in Silakoro and Seguélén, a 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.
Year-on-year changes in Ore Reserve
Inferred Mineral Resource in business plan
as at 31 December 2018

	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Bidini (fresh rock)	0.81	1.28	1.04	0.03
Bidini (oxide)	0.83	0.95	0.79	0.03
Bidini (transitional)	0.20	1.26	0.25	0.01
Kami (fresh rock)	0.27	0.87	0.24	0.01
Kami (oxide)	0.00	0.45	0.00	0.00
Kami (transitional)	0.00	0.64	0.00	0.00
Seguélén (sulphide)	0.03	1.81	0.05	0.00
Silakoro	0.03			

0.70
0.02
0.00
Sorofe (fresh rock)
0.37
1.38
0.51
0.02
Sorofe (oxide)
0.07
0.83
0.06
0.00
Sorofe (transitional)
0.01
0.83
0.01
0.00
Total
2.63
1.13
2.97
0.10
Ore Reserve does not include Inferred Mineral Resource, but within the pit design, Inferred Mineral Resource is included. For the
optimisation, the impact of excluding Inferred Mineral Resource is tested to determine if the pit sizes will still generate a positive cash
flow at $1,100/oz gold price.
The Inferred Mineral Resource within the Ore Reserve design is 4% of the total ore scheduled. The major contributor of Inferred
Mineral Resource material is Bidini. Inferred Mineral Resource exists as pockets located within the Bidini stage 1 design and will be
converted to Indicated and Measured once the access is provided (conversion costs are covered in the 2019/2020 exploration and
grade control budgets).
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SECTION 3 / CONTINENTAL AFRICA

MALI

AngloGold Ashanti has interests in three mines in the West African country of Mali, with Morila being operational, Sadiola being in a limited operating phase and Yatela undergoing closure. Sadiola and Yatela are JV operations with IAMGOLD and the state of Mali, while Morila is a JV with Barrick and the state of Mali. For Yatela, a sale agreement has been entered into with the state of Mali which is subject to several conditions precedent being fulfilled. Sadiola is currently considering a major pushback to access hard rock and Morila is a mature operation focusing on tailings reclamation and small satellite deposits.

The Sadiola operation is managed by AngloGold Ashanti while Barrick manages Morila. There is no Mineral Resource or Ore Reserve reported for Yatela.

Mali – Sadiola

Inclusive Mineral Resource as at 31 December 2018	Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
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

Exclusive Mineral Resource as at 31 December 2018	Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
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
Ore Reserve
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
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
LEGEND
1
Sadiola (41%)
2
Morila (40%)
3
Yatela
(1)
(40%)
0
400km
(1)
Yatela is currently in closure mode.
Operation

MORILA

INTRODUCTION

Property description

The mine is operated by Morila SA, a JV company incorporating Barrick (previously Randgold) (40%), AngloGold Ashanti (40%) and the state of Mali (20%). Randgold took over the operation of Morila mine from AngloGold Ashanti in February 2008. In 2009, Morila was converted to a stockpile treatment operation. Closure of the operation was originally scheduled for 2013 but a pit pushback and a tailings treatment project has extended its life to 2019.

Location

The Morila mine is situated some 280km south-east of Bamako, the capital city of Mali.

History

In 1996, Morila was discovered by Randgold. A PFS in 1998 supported the fast tracking of the mine and, by August 1998, a bankable FS was underway. In 2000, a JV partner was sought and AngloGold purchased 40% of the mine and became the operator of the mine. In February 2001, the Malian president officially opened the mine.

During 2003, a capital expansion programme was completed and increased the production level to 350,000t per month by year-end. In 2008, AngloGold Ashanti considered Morila to be non-strategic and Randgold took over the operational responsibility for Morila.

In 2009 Morila started its transition to a stockpile and tailings retreatment operation.

Legal aspects and tenure

Morila's exploitation permit PE 99/15 (Decree No 99-217/PM-RM) covers 199.8km^2 and was issued on 4 August 1999 for 30 years. An agreement between Birimian Gold Mali SARL (Birimian) and Morila was signed on 24 October 2016 for the Morila team to undertake a six-month feasibility study on the Viper target. The agreement to exercise the option from Birimian was taken after six months on 24 April 2017. The permit was transferred to Morila on 17 May 2018 with the Decret No 99-361/PM-RM. Birimian retain a 22% Royalty and 11% option on the Viper deposit.

Mining method

Production of the Viper satellite pit is via conventional open pit mining methods. All other production is from retreatment of tailings and stockpiles.

Operational infrastructure

All operational infrastructures are in place to support a mining operation including a processing plant, power generation, village and TSF.

Mineral processing

Satellite pit ore together with tailing materials are being processed. The metallurgical plant utilises a conventional CIL process with an upfront gravity section to extract the free gold and has annual throughput capacity of 4.3Mt.

Risks

No material risks have been identified.

Licences
Mining
Mine infrastructure
Pits
Plant
ROM pad
TSF
Waste dumps
Settlements
Villages
Roads
Main
Secondary
Airfield
Plant centroid co-ordinates
06°50’23”W, 11°40’43”N
1.5
0
1.5
3km
Planned
Waste dump and pit
Map showing Morila Mine infrastructure and licences
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SECTION 3 / CONTINENTAL AFRICA

MORILA CONTINUED
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
GEOLOGY
The Morila deposit occurs within a sequence of amphibolite facies Birimian metasediments. The economic mineralisation is located
in these metasediments within a broad north-northwest trending corridor of shearing. This shear zone has near-vertical and at-
lying components and is interpreted as being a second-order shear off the main Banafin shear, approximately 25km to the east. The
Doubalakoro granite pluton borders the metasediments to the west and the Massigui granites lie to the east. Gold mineralisation is
associated with silica-feldspar alteration and the sulphide minerals arsenopyrite, pyrrhotite and pyrite (with minor chalcopyrite).
EXPLORATION
Recent exploration at Morila has been limited to reviews of potential targets, including the Samacline area and drilling at the satellite
pits in support of the production from Viper and Ntiola.
PROJECTS
Birimian option agreement
In 2016, Morila signed an option agreement with Birimian, which provides Morila access to Birimians' Ntiola and Viper projects
which are adjacent to the existing Morila permit.
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
10 x 5, 50 x 100
–
√
√
√
√
–
–
Auger drilling
Indicated
10 x 20
–
√
–
–
√
–
–
Inferred
20 x 40
–
–
–
–
Grade/ore control
10 x 5
–
–
–
–
–
Inclusive Mineral Resource
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
Satellite pit
Measured
–
–
–
–
Indicated
0.16

1.44
0.22
0.01
Inferred
–
–
–
–
Total
0.16
1.44
0.22
0.01
Stockpile (full grade ore)
Measured
0.03
1.47
0.05
0.00
Indicated
–
–
–
–
Inferred
–
–
–
–
Total
0.03
1.47
0.05
0.00
TSFs
Measured
4.78
0.52
2.49
0.08
Indicated
–
–
–
–
Inferred
–
–
–
–
Total

4.78
0.52
2.49
0.08
Morila
Total
4.97
0.56
2.76
0.09
Estimation
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SECTION 3 / CONTINENTAL AFRICA

The grade tonnage curve does not include stockpiles.
Morila is not sensitive to an increase in gold price
and insensitive on the downside as it is a mature
operation at the end of its life with very little
additional opportunity.
Depletions have been partially offset by the addition of Viper and Ntiola open pits from exploration.
Year-on-year changes in Mineral Resource
Inclusive Mineral Resource sensitivity
Grade tonnage curve
The Mineral Resource consists of material from TSF and Domba pit as marginal and mineralised waste stockpiles are depleted. The
TSF forms the bulk of the Mineral Resource and was drilled on a spacing of 50 x 50m and estimated using ordinary kriging methods
into a 50 x 50m block size.

MORILA CONTINUED

ORE RESERVE

Ore Reserve as at 31 December 2018	Tonnes	Grade	Contained gold	
Category	million	g/t	tonnes	Moz
Satellite pit				
Proved	–	–	–	–
Probable	0.17	1.31	0.22	0.01
Total	0.17	1.31	0.22	0.01
Stockpile (full grade ore)				
Proved	0.03	1.47	0.05	0.00
Probable	–	–	–	–
Total	0.03	1.47	0.05	0.00
TSF				
Proved	2.42	0.62	1.50	0.05
Probable				

–
–
–
–
Total
2.42
0.62
1.50
0.05
Morila
Total
2.62
0.67
1.76
0.06
Estimation
The Mineral Resource models are used as the basis for the Ore Reserve. All appropriate costs, metallurgical recovery factors and
geotechnical parameters are applied to generate the mine designs that are used to estimate the final Ore Reserve.
Ore Reserve modifying factors
as at 31 December 2018
Gold
price
US$/oz
Cut-off
grade
g/t Au
Dilution
%
MRF
% (based
on tonnes)
MCF
%
MetRF
%
Satellite pit
1,000
0.79
10.0
97.0
98.0
91.0
TSF
1,000
0.49
5.0
–
100.0
57.0
$1,000/oz Ore Reserve price used by Barrick (operating partner)

Inferred Mineral Resource in business plan
There is no Inferred Mineral Resource included in the business plan.
Depletions were partially offset by the addition of Viper and Ntiola open pits from exploration.
Year-on-year changes in Ore Reserve
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SECTION 3 / CONTINENTAL AFRICA

SADIOLA

INTRODUCTION

Property description

The Sadiola gold deposit is mined by the Société d'Exploration des Mines d'Or de Sadiola S.A. (SEMOS) that is a JV agreement between AngloGold Ashanti (41%), IAMGOLD Corporation (41%) and the state of Mali (18%).

Location

Sadiola is situated in western Mali, 77km to the south of the regional capital of Kayes and about 440km north-west of the capital city of Bamako. The property lies within the Galam Bambouk gold area, which straddles the Mali-Senegal border close to the border with Guinea.

History

Sadiola has a history of alluvial gold working dating back to the 11th century. In 1991/1992 IAMGOLD acquired the rights to the concession and explored the area, and in 1993 Anglo American entered into an earn-in option to the property. In 1994, a FS was completed on the property and accepted by the Mali government.

Construction started in 1995 and on 20 December 1996 the first gold was poured.

In November 2009, IAMGOLD and AngloGold Ashanti announced that they were acquiring the International Finance Corporation's 6% interest for a total of $14.5 million.

A FS, Sadiola Sulphide Project (SSP), looking at mining and processing the sulphide ore was completed in 2016. However, a decision to proceed remains on hold while awaiting the conclusion of negotiations with the government. The oxide mining activities were completed in early 2018. While awaiting the decision, the operation continues to process oxide stockpiled material.

Legal aspects and tenure

SEMOS is bound by the original prospecting and exploitation agreement (including its subsequent legal modifications) entered into on 5 April 1990 between AGEM Limited. (AGEM) and the state of Mali, valid for the original mineral commodities until 5 April 2020. The identity number of the current exploitation area, DECRET No 00-080/PM-RM DU 06 MARS 2000 is a modification of all previous exploitation areas. Sadiola is operated under the license DECRET No 00-080/PM-RM DU 06 MARS 2000 valid from 1 August 1994 to 1 August 2024 covering a total area of 303km^2. The SSP project will extend operations beyond 2024. Dialogue with the government of Mali has been ongoing throughout the project study phase and, as such, there are no foreseeable reasons why the amended ESIA and associated approvals should not be approved.

Mining method

Open pit mining operations ceased at Sadiola in 2018. The operation is currently based around stockpile re-claim with ore feed scheduled until Q3 of 2019.

The SSP is currently in care and maintenance. The ore re-claim is undertaken using a mining eet consisting of a loader and rear dump trucks. The planned mining method for the SSP is conventional open pit mining, using a combination of hydraulic face shovels and rear dump trucks working on 10m benches.

Operational infrastructure

Sadiola includes a main pit and several smaller satellite pits, a processing plant, a TSF and other infrastructure such as a mine village, water supply system, roads, airstrip and communications systems. Since the beginning of the operation mining activities have been outsourced. All mining occurs within the mining licence boundaries.

Mineral processing

Ore is treated in a 4.9Mtpa CIP processing plant. The plant was originally designed to treat only soft oxide ore, but has been progressively adapted to include a blend of hard oxides as well as batch feeding of a sulphide ore blend. Any hard material making up the blend currently undergoes preconditioning through separate primary crushers.

The SSP aims to mine the underlying sulphide material in the Sadiola main pit and modify the existing oxide plant to process the sulphide ore. The modified plant will treat both sulphide stockpiles and the

ROM sulphide material. This project will extend the life of Sadiola and leverage any further sulphide exploration successes in the region.

Risks

The oxide ore from pits was finished in March 2018. Since then, only oxide stockpiles are available and can feed the processing plant until Q3 2019.

The SSP project has been re-evaluated based on the current economic climate. As part of the revision, an amended ESIA was completed in 2017 and approved by the government of Mali.

With the current LOM schedule, the oxide ore from pits was finished in 2018. Since then, low grade stockpiles are being fed to the process plant, and will form the feed supply until Q3 of 2019.

The project is paused pending favourable conclusion of discussions with the government of Mali on fiscal agreements.

SADIOLA CONTINUED

Competent Persons

Responsibility	Competent Person	Professional organisation	Membership number	Relevant experience	Qualification
Mineral Resource	Geoffrey Gushee	FAusIMM	207 957	30 years	BA (Geology), GDE (Mining Engineering), MEng (Mineral Resource Management), MDP
Ore Reserve	Andrew Bridges	MAusIMM	300 976	20 years	BSc Hons (Mining Engineering)

GEOLOGY

The Sadiola gold deposits are located within the Malian portion of the Kenieba-Kedougou Inlier, a major early Paleoproterozoic-Birimian window along the northeast margin of the Kenema-Man shield. The deposits are in the north of the inlier and positioned in the Ko Formation, just east of the Senegalo-Malian Shear Zone terrane boundary. Greenschist facies regional metamorphism with amphibolite facies metamorphism is observed in the contact aureoles around major intrusions.

Deposit type

The Sadiola deposit is considered a mesothermal shear-hosted gold deposit and can be correlated with an Ashanti-type orogenic gold model.

Mineralisation style

The Sadiola gold system displays the Sadiola Hill-style Au-As-Sb mineralisation. Within the Sadiola main pit, the bulk of the ore is hosted within the brittle-ductile Sadiola Fracture Zone (SFZ) and impure footwall carbonates. Mineralisation also occurs along the

array of NNE-trending shears although gold grade decreases with increasing distance from the SFZ.
Mineralisation is shear-hosted and associated with a polyphase hydrothermal alteration history comprising an early calc-silicate
phase followed by a potassic alteration stage. The metal associations of the ore typically comprise As-Au-Sb and minor to trace
amounts of Cu-W-Mo-Ag-Bi-Zn-Pb-Te-Fe-bearing mineral species.
Structural controls on primary mineralisation in the FE satellite pits are similar to that of Sadiola but later karstification and protracted
weathering resulted in the formation of a gold residuum.
Lithostratigraphic contacts also appear to have been an efficient interface for channeling fluids.

Oxide mineralisation

The geometry of the extensive, soft, oxide deposit and its supergene enrichment of gold relates almost exclusively to the weathering
history of the primary mineralisation. Intense tropical weathering has produced deep troughs of white to grey, decarbonated, kaolin-
rich saprolite, locally abundant nontronite and relative gold enrichment. Penetration of groundwater has caused oxidation of the
primary sulphides and the formation of acidic groundwaters, further promoting deeper argillisation of the bedrock.

Sulphide mineralisation

Drilling of the (unweathered) primary mineralisation has allowed detailed investigation of major and minor hydrothermal alteration
processes that were active during the formation of the deposit. Primary gold is fine grained, dominantly less than 15 microns,
with rare grains approaching 50 microns. Visible gold is rare. Gold mineralisation is associated with both arsenic and antimony
dominated sulphide assemblages of arsenopyrite, pyrrhotite, pyrite, stibnite and gudmuntite as well as potassic, calc-silicate,
propylitic alteration and silicification.

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SECTION 3 / CONTINENTAL AFRICA

Licences
Mining
Mine Infrastructure
Pits
Plant
ROM pad
TSF
Return water dam
Raw water dam
Waste dumps
Settlements
Towns
Mine village
Villages
Roads
Main
Secondary
Airfield
0
2
4
6km
Plant centroid co-ordinates
11°40’09”W, 13°53’27”N
Map showing Sadiola Mine infrastructure and licences

SADIOLA CONTINUED
W
-100m
-
200m
-300m
-400m
100m
Ductile shear zone with mixed protolith
Brittle shear zone – carbonate breccia
Quartz-feldspar-phyric felsic metadyke
Metadiorite
Hangingwall metagreywacke
Footwall impure metalimestone
Orebody – Sadiola fracture zone (SFZ)
Section definition boundary
Elevation
E
Legend

Mineralisation characteristics

The gold mineralisation in the Sadiola main pit is related to the interaction of the north-striking SFZ and a north-northeast-striking fault array. The SFZ follows the competency contrast between the brittle hangingwall greywacke and the ductile footwall marbles and is mineralised over a drilled strike length of approximately 2,500m. The stratigraphy is intruded by discontinuous diorite and quartz-feldspar porphyry dykes. Mineralisation occurs in all four rock types although most of the mineralisation is hosted in the footwall carbonates adjacent to the SFZ. The deposit has been intensely weathered to a maximum depth of 200m.

At the FE pits, located about 7km to the southeast of the Sadiola main pit, mineralisation is hosted in marbles adjacent to the upper contact with carbon-rich pelites. Gold is associated with north-northeast to north-east striking faults and lens-shaped breccia zones that are broadly parallel to the north-west-trending stratigraphy. The FE4 deposit is located in an interbedded sandstone and pelite sequence with mineralisation predominantly hosted in breccia along a north-east striking regional shear and several subsidiary north-northeast-trending faults.

At Tambali, located 2km to the south of the Sadiola main pit, the mineralisation is associated with two sets of structures, orientated north-northeasterly (dipping steeply south-east) and north-westerly (dipping south-west). These structures are often related to thin tourmaline-quartz-rich shears/veins or zones of (mostly north-northeast trending) quartz-feldspar porphyry intrusions that have undergone later shearing. A north-west trending graphite-rich brecciated boundary between southwesterly-dipping sandstones (in the east) and metapelites (in the west) is also evident. Bedding parallel shearing is also indicated in some areas, possibly accounting for some of the westerly-dipping mineralised structures. Tambali mineralisation is similar in style to the Sadiola main pit and it is subjected to similar structural controls.

W-E Geological cross-section through the Sadiola pit, elevation in metres relative to average mean sea level

EXPLORATION

Exploration activities wound down in early 2018 as the mine was heading into restricted operations, pending the outcome of the SSP project.

PROJECTS

The SSP remains the only major AngloGold Ashanti project in Mali and is the focus for extension of the LOM. The project has been re-evaluated and optimised in light of the current economic and political climate. The project consists of a new pushback in the Sadiola main pit in order to mine the underlying sulphide ore, and an expansion and upgrade of the existing processing plant to be able to treat the sulphide ore. The revised project extends operations beyond 2024. As part of the revision, an amended ESIA was completed in 2017 and approved by the government of Mali. Dialogue with the government of Mali has been ongoing throughout the project study phase. The project is paused pending favourable conclusion of discussions with the government of Mali on scal agreements.

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
6.25 x 12.5, 25 x 25
√
√
√
√
–
–
–
Indicated
25 x 25, 50 x 25
√
√
√
√
–
–
–
Inferred
50 x 50
–
–
–

Grade/ore control
5 x 10, 6.25 x 12.5
–
–
–
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SECTION 3 / CONTINENTAL AFRICA

SADIOLA CONTINUED

Inclusive Mineral Resource
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
FE2				
Measured	–	–	–	–
Indicated	0.14	1.48	0.20	0.01
Inferred	0.00	1.30	0.00	0.00
Total	0.14	1.48	0.20	0.01
FE3				
Measured	–	–	–	–
Indicated	1.02	1.88	1.93	0.06
Inferred	0.03	2.13	0.07	0.00
Total	1.06	1.89		

2.00
0.06
FE4
Measured
–
–
–
–
Indicated
0.03
2.25
0.06
0.00
Inferred
0.01
2.84
0.03
0.00
Total
0.04
2.39
0.09
0.00
FN
Measured
–
–
–
–
Indicated
2.44
1.35
3.29
0.11
Inferred
0.30
1.19
0.36
0.01
Total
2.74
1.33
3.65
0.12
Tabakoto (Sekokoto)
Measured
–
–
–
–
Indicated

0.33
1.23
0.41
0.01
Inferred
0.05
1.12
0.05
0.00
Total
0.38
1.22
0.46
0.01
Tambali
Measured
–
–
–
–
Indicated
1.70
1.04
1.77
0.06
Inferred
0.50
1.19
0.59
0.02
Total
2.20
1.08
2.36
0.08
SSP (oxide)
Measured
–
–
–
–
Indicated
1.71
1.30
2.24
0.07
Inferred
0.19
1.05
0.20
0.01

Total
1.91
1.28
2.44
0.08
SSP (transitional)
Measured
–
–
–
–
Indicated
1.18
1.89
2.22
0.07
Inferred
0.14
1.57
0.22
0.01
Total
1.32
1.85
2.44
0.08
SSP (sulphide)
Measured
–
–
–
–
Indicated
36.75
1.94
71.44
2.30
Inferred
6.02
1.77
10.67
0.34
Total
42.77
1.92
82.11
2.64
Total stockpiles
Measured
0.05
1.66

0.08
0.00
Indicated
2.93
1.53
4.48
0.14
Inferred
–
–
–
–
Total
2.98
1.53
4.56
0.15
Sadiola
Total
55.52
1.81
100.31
3.23
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SECTION 3 / CONTINENTAL AFRICA

Estimation

The Mineral Resource is taken as the material that falls within the $1,400/oz economic pit shell optimised for each individual deposit. A 3D surface is generated to create the outline of the geological model within which grades are estimated. Block sizes are between 25 x 25 x 10m and 30 x 30 x 10m and, where appropriate, selective sub-celling is used for definition on the geological and mineralisation boundaries. All the deposits are estimated by ordinary kriging. Where deemed appropriate, a geostatistical technique called uniform conditioning (UC) or localised uniform conditioning (LUC) is used to estimate the proportion of material that occurs above the cut-off, hence forming a recoverable Mineral Resource model at a specific SMU.

Grade tonnage curve

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
Sadiola				
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

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 favourable costs. The Inferred Mineral Resource portion of the Mineral Resource
within the Ore Reserve pit design will be converted to the Ore Reserve through grade control drilling.

SADIOLA CONTINUED

The Mineral Resource models and inputs used to tabulate the Mineral Resource were the same as the previous year. The main
change is due to depletion.

Year-on-year changes in Mineral Resource

Sadiola is very sensitive to a drop in gold price due
to the low grade nature of the stockpiles.

Inclusive Mineral Resource sensitivity

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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
FN
Proved
–
–
–
–
Probable
0.78
1.48
1.15
0.04
Total
0.78
1.48
1.15
0.04
SSP (oxide)
Proved
–
–
–
–
Probable
0.66
1.56
1.03
0.03
Total
0.66
1.56
1.03
0.03
SSP (transitional)
Proved
–
–
–
–
Probable
0.70

2.10
1.47
0.05
Total
0.70
2.10
1.47
0.05
SSP (sulphide)
Proved
–
–
–
–
Probable
21.03
2.02
42.51
1.37
Total
21.03
2.02
42.51
1.37
Total stockpiles
Proved
0.05
1.66
0.08
0.00
Probable
2.93
1.53
4.48
0.14
Total
2.98
1.53
4.56
0.15
Sadiola
Total
26.15
1.94
50.72
1.63
Estimation
The Mineral Resource models are used as the basis for the Ore Reserve. Optimisations are run on the Measured, Indicated and
Inferred Mineral Resource. All appropriate costs, metallurgical recovery factors and geotechnical parameters are applied to generate

the mine designs that are used to estimate the final Ore Reserve.

Ore Reserve modifying factors
as at 31 December 2018

	Gold price US$/oz	Cut-off grade g/t Au	Dilution %	RMF % (based on g/t)	MCF %	MetRF %
FN	1,200	0.77	17.6	85.0	100.0	76.0
SSP (oxide)	1,200	0.51	0.0	0.0	100.0	94.0
SSP (transitional)	1,200	0.78	0.0	0.0	100.0	75.0
SSP (sulphide)	1,200	0.77	0.0	0.0	100.0	76.0
Total stockpiles	1,200	0.68	–	–		

100.0
78.0
MetRF varies according to ore type (laterite, saprolite, siliceous oxide, saprolitic sulphide, hard sulphide, intermediate oxide,
intermediate sulphide, transitional and graphitic). A $1,200/oz Ore Reserve price is used for the SSP project and short term oxide
pits.
The modifying factors applied to the Ore Reserve for Sadiola are ore loss and dilution. For the satellite pits, due to the nature of the
mineralisation, the ore loss and dilution are different from the SSP main pit.
The SSP main pit utilises ore loss incorporated into the modelling process. The other satellite pits have variable ore loss and dilution
applied dependent on mining method. The satellite pits that are to be mined as part of the SSP have 15% ore loss and 17.6%
dilution applied. The latter is to allow for mining by a face shovel rather than an excavator.
Inferred Mineral Resource in business plan
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SADIOLA CONTINUED
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as at 31 December 2018
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
FN
0.02
1.24
0.03
0.00
SSP (oxide)
0.04
1.16
0.05
0.00
SSP (transitional)
0.05
1.12
0.06
0.00
SSP (sulphide)
0.52
1.16
0.60
0.02
Total
0.64
1.16
0.74
0.02
Inferred Mineral Resource has been included in the business plan as incidental material when the pit is mined. Several of the satellite
pits that are included in the SSP contain Inferred Mineral Resource with the overall Inferred Mineral Resource included in the total
business plan totalling approximately 2%.
Mainly due to depletion and the exclusion of Tambali and FE3 pits.
Year-on-year changes in Ore Reserve
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TANZANIA

Geita is AngloGold Ashanti's only operation in Tanzania and one of the largest open pit gold mines in Africa. Prior to April 2004, Geita was managed under a JV agreement between Ashanti and AngloGold. Since the merger, Geita is a wholly owned subsidiary of AngloGold Ashanti.

In 2016, underground mining successfully started at Star and Comet to provide ore to the processing plant. Underground ore is now a significant part of the feed to the plant with underground operations also having commenced at Nyankanga.

Tanzania – Geita

Exclusive Mineral Resource
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
Tanzania
Total
41.37
3.70
153.19
4.93
Ore Reserve
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
Tanzania
Total
9.47
4.38
41.49
1.33
LEGEND
1
Geita
0
200km
Operation
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GEITA

INTRODUCTION

Property description

Geita is wholly owned by AngloGold Ashanti and currently sources ore from the Nyankanga open pit and three underground sections (Star and Comet Cut 2, Star and Comet Cut 3 and Nyankanga Block 5). Underground mining commenced at Star and Comet in 2016 and at Nyankanga in 2017.

Location

Geita Gold Mine (GGM) is located approximately 910km from the Tanzanian capital city of Dar es Salaam. It falls within the Lake Zone of northern-western Tanzania, approximately 120km west of Mwanza and 4km away from the town of Geita. The mining lease area falls within the Archean Sukumaland Greenstone Belt of the Lake Victoria goldfields.

History

In 1936, the Geita deposits were first discovered and by 1966, three mines had produced almost 1Moz. Ashanti acquired the project through acquisition of Cluff Resources in 1996 and in early December 2000, Ashanti reached an agreement to sell AngloGold a 50% interest in Geita for $324 million. AngloGold added its neighbouring Nyamulilima Hill deposits into the JV company. In 2004, the merger of AngloGold and Ashanti resulted in the operation being run by AngloGold Ashanti. The decision was taken to go underground at Star and Comet in 2015 and the underground development started in 2016. In 2017 the Nyankanga underground operation was started.

Legal aspects and tenure

The special mining licence (SML45/99) covers approximately 196.17km^2 and expires on 26 August 2024. There are a further 120km^2 of prospecting licences in the immediate vicinity to the SML. However, these do not contain any Ore Reserve.

Mining method

Mining at Geita is by both open pit and underground methods. The open pit mining is currently undertaken by conventional truck-and-shovel open pit mining method on one active pit (Nyankanga). The open pit mining is conducted using Geita owned, operated and maintained eet. A contractor provides drilling and blasting services. Underground mining commenced at Star and Comet in 2016 and subsequently at Nyankanga in 2017 using the services of an underground mining contractor. Ore is hauled from the Star and Comet operation to the central ROM pad by the Geita surface mining eet.

Operational infrastructure

Geita has an established 5.2Mtpa CIL processing plant capable of processing hard ore. It also has an established TSF with sufficient area to construct wall raises every three years to accommodate planned future production. A full workshop facility is in place to support the maintenance of heavy mining equipment and all light support equipment. Contractor infrastructure supported on the mine site includes workshops for the production and exploration drilling contractor, workshops for the underground mining contractor, as well as a plant for the explosives supplier. Geita has further support infrastructure in place including a mine village, medical clinic, mine store, administration buildings and an airstrip.

Mineral processing

Geita's ore processing method is via conventional CIL process. The CIL plant has a throughput capacity of 5.2Mtpa. The circuit contains a primary gyratory crusher, secondary and tertiary crushers, a semi-autogenous mill, ball mill and 12 leach tanks. This is coupled with a gravity circuit through two knelson concentrators. In planning the plant feed blend material hardness, grade and sulphide content are considered in order to optimise throughput and recovery.

Risks

There are regular artisanal and small scale miners activities and illegal intrusions into the mine, but there is a holistic mitigation plan in process to manage this.

The primary risk remains the changing Ore Reserve profile from open pit to underground. The mitigating actions put in place focus on optimising the exploration and project plans to convert both surface and underground Mineral Resource to Ore Reserve. The other risks include, reduced underground production efficiencies when transitioning to owner mining in selected areas, ball mill and crusher plant integrity, Mineral Resource to Ore Reserve conversion, open pit and underground blasting interaction for Nyankanga Cut 8 and Nyankanga Block 3 underground and the aging eet for open pit.

Competent Persons
Map showing Geita Mine infrastructure and licences
0
1.5
3
4.5km
Plant centroid co-ordinates
32°11’12”W, 2°51’53”N
Licences
Mining
Exploration
Underground access
Active
Planned
Mine infrastructure
Pits
Plant
ROM pad
Stockpiles
TSF
Waste dumps
Raw water dam
Deposit
Settlements
Towns
Villages
Roads
Main
Secondary
Airfield
GEOLOGY
Deposit type
The Geita Greenstone Belt (GGB) hosts several world-class shear-hosted Archean lode gold deposits and forms the northern
portion of the regional Sukumaland Greenstone Belt, itself one of several belts that comprise the Lake Victoria goldfields. Other gold
mines hosted in the Lake Victoria Goldfields include Golden Pride, Bulyanhulu, Tulawaka, Buzwagi and North Mara.
The east-west oriented GGB is 60km in length, up to 15km wide. The Geita terrain is comprised of upper- to mid-Nyanzian
greenschist facies units, made up of clastic sediments, black shales, banded iron formation (BIF), volcanoclastics and metabasalts.
These have been intruded by a variety of felsic to mafic intrusive bodies, dykes and sills. Gabbro dykes accommodated by regional
north-northeasterly structures are also prominent geological features in the area.
North-west trending deformation corridors divide the GGB into three distinct sub-terrains, namely the Nyamulilima Terrain in the
west (hosting the Star and Comet, Ridge 8 and Roberts deposits), the Central Terrain in the central part (hosting the Nyankanga,
Geita Hill, Lone Cone and Chipaka deposits) and the Kukuluma Terrain to the north-east (hosting the Matandani, Kukuluma and
Area 3 West deposits).

GEITA CONTINUED

Mineralisation style

Geita's gold mineralisation is preferentially hosted in BIF, cherts and ironstones that have been affected by both ductile and dominant brittle deformation associated with shear zones. The shears preferentially exploit fold axial planes as well as the contacts between the supracrustal and intrusive rocks.

The GGB has been through a protracted history of deformation, which resulted in a large-scale synformal configuration in the Central Terrain, with west-northwest trending limbs connected by a north-east trending hinge zone. The deposits of the Central Terrain are mainly located within the relatively low-strain hinge zone.

The Nyankanga deposit is hosted in a BIF-dominated supracrustal package that is extensively intruded by, and locally form a roof-pendant within the dioritic Nyankanga Intrusive Complex. At Geita Hill, dioritic rocks are present as sills and dykes intruded into a supracrustal sequence that has been subject to extensive polyphase folding.

To the west, the Nyamulilima Terrain comprises a semi-circular structure surrounding intrusive centers, which internally encompasses structural systems of variable scale that locally control gold mineralisation. At Star and Comet, a folded sedimentary package of BIF intercalated with clastic and tuffaceous metasediments is intruded by a tonalitic complex.

The Kukuluma Terrain trends west-northwesterly, with sub-vertical limbs being dominant over compressed, multiphase folded zones.

The three major deposits in the area (Kukuluma, Matandani and Area 3) are located along a 5km long east-southeast mineralisation trend. The geology of the deposits is dominated by volcano-sedimentary rocks that are polydeformed and intruded by syn- to late-folding diorite bodies. Host rocks for mineralisation are fine-grained iron-rich clastic sediments, cherts, BIF and tuffaceous rocks, with local intercalated carbonaceous shales.

Mineralisation characteristics

Gold mineralisation at Nyankanga occurs within a northeast trending and northwest dipping anastomosing shear system, typically along the lowermost shears, with higher grade mineralisation mainly proximal to the basal contact of BIF packages. Mineralisation is associated with chlorite-carbonate-silica alteration and pyrite-dominant sulphide in the damage zones surrounding the shear surfaces as veins, veinlets, local breccias and sulphide replacement of magnetite layers. At Geita Hill, mineralisation at the deposit scale is controlled by a narrow northeast trending and northwest dipping shear zone that exploits the axial surfaces of F3 folds.

The bulk of the ore is also carried by damage zones adjacent to the main shear.

At Star and Comet, a major mineralised shear zone runs north-northwest to south-southeast through the deposit where it is localised along the contact of BIF and tonalite. An envelope of mostly brittle deformation up to 10m thick (which affects both lithologies) occurs either side of the shear zone and controls distribution of mineralisation. Most of the gold mineralisation is hosted in pyrrhotite patches associated with strong silicification together with carbonate alteration.

Within the Kukuluma Terrain, steeply dipping ductile/brittle gold-fertile shear zones are developed along, or close to, the edges of
an elongate diorite body, hosted in iron-rich host rocks and locally exploiting axial surfaces of tight folds. Gold mineralisation in the
Kukuluma terrain is strongly associated with pyrrhotite, pyrite and arsenopyrite concentrations, accompanied by strong carbonate
and silica alteration of host rocks. Gold is present in gold minerals and sulphides, dominantly in arsenopyrite.
Geita Hill, Lone Cone, Nyankanga Long Section: potential down-plunge ore shoots (view looking SE)
Indicated and Inferred Mineral Resource @ Au>2g/t
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EXPLORATION

A total of 68,313m surface and underground exploration drilling was completed during the year consisting of 64,050m of DD and 4,263m at Star and Comet underground, Nyamulilima, Nyankanaga underground, Selous and Geita Hill West underground.

Mineral Resource conversion drilling at Star and Comet Cut 2 and Cut 3 improved the understanding of the geological and mineralisation controls of the deposits which led to the redesigning of mining stopes and underground infrastructure as well as improving Mineral Resource confidence. Several intersections reported from Cut 2 exploration drilling confirmed the down plunge extension of the main mineralised zone below the 1000mRL (LOM extent). Further drilling is proposed in 2019 to continue defining the extension of mineralisation as well as confirming the geology and geometry of the deposit above and below the intrusive body which appears to truncate mineralisation. Several exploration holes at Cut 3 were also planned to test the down plunge high grade zone to 650mRL from the current 1000mRL (LOM extent). These holes confirmed the down-plunge continuity of gold mineralisation which remains open at depth. The 2019 work plan motivates further drilling to continue defining the down-plunge extension of Star and Comet Cut 3 as well as converting exploration targets into Inferred/Indicated Mineral Resource.

Drill results from Nyankanga Block 5 lower, 4 and 3 lower were used to update the Mineral Resource model in these areas and the associated mining designs. The mineralisation at Block 3 lower continues towards Block 2, suggesting that the designed mining stopes, (upper and lower) are linking up/down-dip and down-plunge. These results warrant further drilling in 2019. At Nyankanga Block 4 the drilling results in the north east most section indicate open-ended potential downdip towards Block 3, suggesting that the two Blocks are connected. Further drilling is required to follow up on these results. Drill results from Nyankanga Block 5 confirm that mineralisation is controlled by the intersection of the Iyoda shear/faults and the Nyankanga Shear zone. Two exploration holes were also drilled from surface to test the potential down-plunge continuity of gold mineralisation at Nyankanga Block 5 Lower.

The geological features that formed the basis of the targeting were not intersected, suggesting that the mineralisation has been displaced. Detailed geological and structural studies are ongoing before planning for additional drilling.

E-W Geological cross-section through Star and Comet, elevation in mRL

Structure

LEGEND

Section definition boundary

Shear zone

BIF

Brecciated BIF (zone)

Dolerite

Felsite

Lamphrophyre

Lithology

Tonalite

0 12.5 25 50m
1,100
1,100
1,300
1,300
1,500
0
100
200
300
400
500
600
700
0
100
200
300
400
500
600
700
1,500
125
SECTION 3 / CONTINENTAL AFRICA

GEITA CONTINUED

At Geita Hill West, a drilling campaign was completed in November 2017. While this programme was successful, a second phase of drilling was required which commenced in October 2018 with the intention of upgrading the Mineral Resource currently within the underground mine designs/stopes at Block 1 and 2 to Indicated Mineral Resource ahead of underground mining development and is expected to be completed in January 2019.

Expensed reconnaissance drilling programmes were conducted at satellite targets Selous and Mabe. Several of the drill holes from Selous and Mabe reported encouraging intersections that warranted follow-up and consequently a conceptual mineralisation model was created for Selous. The current conceptual model suggests economic viability of the project, and will require further drilling in 2019.

A single phase of drilling was completed at Star and Comet NW Extension aimed at testing two potential mineralised zones away from the intrusive unit. Drill hole SCDD0039 intersected two structures as expected, characterised by semi massive sulphides (mainly pyrrhotite) in a breccia matrix. Significant gold assays were intercepted, associated with the first structure and remain open-ended downdip.

One drill hole was drilled from underground at Block 5 targeting a 3D Seismic target (Target 1) at Nyankanga. The hole was targeting a strong seismic reflector located immediately south of the Nyankanga pit. The drill hole encountered diorite and there was no economic intersection reported from this drill hole.

Non-drilling programmes included a Down-Hole Electromagnetic (DHEM) survey at Star and Comet, Selous and Nyankanga to delineate and identify relatively deeply seated or dislocated orebodies away from the main mineralisation. Several conductors were identified during the survey and will be followed up in 2019. Detailed surface geological mapping and interpretation at Nyamulilima, Kalondwa Hill, Samena-Fikiri-Jumanne, Prospect 30, Prospect 5 and Nyamonge Hill also occurred during the year.

An exploration workshop was also conducted on site in October 2018. The aim of the workshop was to review exploration targets within the GGM mining and exploration concessions, identify new targets, re-rank existing and new targets and reevaluate the endowment potential of the district.

PROJECTS

GGM's exploration strategy is focused in three key areas. The first was to increase the Mineral Resource/Ore Reserve base of the main producing deposits while transitioning to underground. The second key area was aggressive exploration of the satellite targets within GGM's tenement holdings to bring into production and the third was exploration activities to support major long lead projects.

Underground mining successfully started at Star and Comet Cut 2 in 2016. Development at Star and Comet Cut 3 was initiated from the Cut 2 platform and was ramped up as planned in 2017. Detailed mine design, planning and permitting for Nyankanga underground was completed in 2016 and underground development commenced at Blocks 4 and 5 in 2017. Underground exploration drilling has successfully converted exploration targets and Inferred Mineral Resource to Indicated Mineral Resource in these deposits. Following the successful implementation of underground operations at Star and Comet and Nyankanga underground, exploration and development will be expanded to include Geita Hill and Ridge 8 deposits in 2019.

There are approximately 50 conceptual exploration targets within GGM's leases. Resourcing this exploration programme, termed the satellite target exploration programme, has lagged following the gold price decline in 2013 and reduction in spending. The programme was re-planned and re-evaluated in 2017 and dedicated work plans have been put in place to support a more aggressive exploration programme. Consistent with previous years, the targets that have the potential to provide near term value in the LOM plan have been prioritised.

The Refractory Ore project which encompasses, Matandani, Kukuluma, Area 3W and Area 3CS was postponed due to high capital costs related to plant modifications to treat the refractory ore and the transition to underground mining. Drilling was completed in 2015 within the Matandani pit, which contains the largest Mineral Resource potential. Metallurgical scoping test work was successfully concluded in 2016 and the PFS that was planned to commence in 2017 was put on hold.

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
10 x 10, 20 x 20, 25 x 15,
25 x 25, 40 x 20, 40 x 40
–
–
–
–
Inferred
40 x 40, 50 x 50, 80 x 40
–
–
–
–
Grade/ore control
5 x 10, 10 x 5, 10 x 10,
10 x 15
–
–
–
Underground: diamond
fan drilling
Open pit: RC grid
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SECTION 3 / CONTINENTAL AFRICA

GEITA CONTINUED
Inclusive Mineral Resource
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Area 3 West (oxide)				
Measured	–	–	–	–
Indicated	0.21	2.71	0.58	0.02
Inferred	0.00	2.41	0.00	0.00
Total	0.21	2.70	0.58	0.02
Chipaka				
Measured	–	–	–	–
Indicated	0.28	2.29	0.65	0.02
Inferred	0.45	2.45	1.10	0.04
Total	0.73	2.39		

1.75
0.06
Geita Hill (open pit)
Measured
–
–
–
–
Indicated
0.01
3.15
0.03
0.00
Inferred
0.04
1.84
0.07
0.00
Total
0.05
2.11
0.10
0.00
Kalondwa Hill
Measured
–
–
–
–
Indicated
–
–
–
–
Inferred
0.63
3.83
2.41
0.08
Total
0.63
3.83
2.41
0.08
Kukuluma (oxide)
Measured
–
–
–
–
Indicated

0.02
3.82
0.08
0.00
Inferred
0.00
2.68
0.01
0.00
Total
0.03
3.67
0.09
0.00
Kukuluma (transitional)
Measured
–
–
–
–
Indicated
0.08
4.89
0.39
0.01
Inferred
0.02
4.97
0.10
0.00
Total
0.10
4.91
0.49
0.02
Kukuluma (sulphide)
Measured
–
–
–
–
Indicated
0.02
5.08
0.12
0.00
Inferred
0.29
4.20
1.23
0.04

Total
0.32
4.26
1.35
0.04
Lone Cone
Measured
–
–
–
–
Indicated
0.64
3.07
1.96
0.06
Inferred
0.62
3.29
2.05
0.07
Total
1.26
3.18
4.01
0.13
Matandani (oxide)
Measured
–
–
–
–
Indicated
1.37
2.26
3.09
0.10
Inferred
0.70
2.27
1.60
0.05
Total
2.07
2.26
4.69
0.15
Matandani (transitional)
Measured
–
–

–
–
Indicated
0.09
3.77
0.33
0.01
Inferred
0.09
4.50
0.42
0.01
Total
0.18
4.15
0.74
0.02
Matandani (sulphide)
Measured
–
–
–
–
Indicated
0.04
4.79
0.21
0.01
Inferred
2.37
4.65
11.02
0.35
Total
2.42
4.65
11.23
0.36
Nyankanga (open pit) Cut 8
Measured
–
–
–
–
Indicated
4.39
5.23
22.95
0.74
Inferred
0.49

1.38
0.67
0.02
Total
4.88
4.84
23.62
0.76
Ridge 8 (open pit)
Measured
–
–
–
–
Indicated
0.92
2.26
2.07
0.07
Inferred
0.00
1.20
0.00
0.00
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SECTION 3 / CONTINENTAL AFRICA

Inclusive Mineral Resource continued
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
Total
0.92
2.26
2.08
0.07
Roberts
Measured
–
–
–
–
Indicated
2.77
1.89
5.22
0.17
Inferred
0.09
4.00
0.37
0.01
Total
2.86
1.96
5.59
0.18
Star and Comet (open pit)
Measured
–
–
–
–
Indicated
0.24
2.44
0.58
0.02
Inferred
0.02
2.10
0.05

0.00
Total
0.26
2.41
0.63
0.02
Stockpile (full grade ore)
Measured
0.27
3.16
0.86
0.03
Indicated
–
–
–
–
Inferred
–
–
–
–
Total
0.27
3.16
0.86
0.03
Stockpile (marginal ore)
Measured
–
–
–
–
Indicated
8.87
0.97
8.56
0.28
Inferred
–
–
–
–
Total
8.87
0.97
8.56
0.28
Stockpile (refractory ore)
Measured
–

–
–
–
Indicated
0.56
2.80
1.57
0.05
Inferred
–
–
–
–
Total
0.56
2.80
1.57
0.05
Geita Hill (underground)
Measured
–
–
–
–
Indicated
1.97
4.10
8.09
0.26
Inferred
9.52
4.21
40.04
1.29
Total
11.49
4.19
48.13
1.55
Nyankanga (underground) – Block 1
Measured
–
–
–
–
Indicated
0.61
8.39
5.13
0.16
Inferred

0.41
7.43
3.03
0.10
Total
1.02
8.01
8.15
0.26
Nyankanga (underground) – Block 2
Measured
–
–
–
–
Indicated
0.31
6.38
1.99
0.06
Inferred
1.01
6.16
6.25
0.20
Total
1.33
6.21
8.24
0.26
Nyankanga (underground) – Block 3
Measured
–
–
–
–
Indicated
0.21
5.10
1.07
0.03
Inferred
2.02
5.41
10.91
0.35
Total
2.23
5.38
11.98
0.39

Nyankanga (underground) – Block 4
Measured
0.67
7.56
5.06
0.16
Indicated
0.32
6.99
2.21
0.07
Inferred
0.41
4.39
1.78
0.06
Total
1.39
6.51
9.04
0.29
Nyankanga (underground) – Block 5
Measured
–
–
–
–
Indicated
1.44
7.05
10.16
0.33
Inferred
0.19
7.35
1.36
0.04
Total
1.63
7.08
11.52
0.37
Ridge 8 (underground)
Measured
–
–
–
–
Indicated
0.49
5.45

2.69
0.09
Inferred
1.48
5.92
8.75
0.28
Total
1.97
5.80
11.44
0.37
Star and Comet (underground) Cut 2
Measured
–
–
–
–
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SECTION 3 / CONTINENTAL AFRICA

GEITA CONTINUED

Inclusive Mineral Resource continued

as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Indicated	0.97	4.71	4.55	0.15
Inferred	0.38	5.38	2.07	0.07
Total	1.35	4.90	6.62	0.21
Star and Comet (underground) Cut 3				
Measured	–	–	–	–
Indicated	1.28	4.92	6.29	0.20
Inferred	0.57	5.11	2.91	0.09
Total	1.85	4.98	9.20	0.30
Geita				
Total	50.86	3.83		

194.69
6.26
Estimation
For the open pits, the mineralisation boundaries for the individual deposits are defined from the detailed logging of all geological
drill holes. This information is validated and then used to create a 3D model. The geological model is subsequently populated with
an appropriately dimensioned block model. Ordinary kriging is used to interpolate values into the blocks. UC is used to generate
a recoverable Mineral Resource model which estimates the proportion of ore that occurs above the Mineral Resource cut-off
grade assuming a specified SMU. The open pit Mineral Resource is reported within a $1,400/oz optimised pit shell and above the
calculated mineralised waste cut-off grade per pit. Stockpiled material above mineralised waste cut-off grade is included in the
Mineral Resource.
For the underground Mineral Resource, the geological model and the mineralised boundary are generated in the same way as for
the open pits. However, a high grade wireframe is delineated within the broader, lower grade mineralised envelope. In this instance,
all geological controls are adhered to when determining this domain. Ordinary kriging models are then constructed within the low
and high grade domains and numerous validation exercises are completed to ensure robust estimates are achieved. The ultimate
open pit designs are used as the limiting boundaries between open pit and underground during the model compilation. The
underground Mineral Resource is reported inside a mineable shape optimiser (MSO) shape generated using a given underground
cut-off grade for each deposit. The underground stopes and development are evaluated using the ordinary kriging models and the
open pit designs are evaluated using the UC models.
The grade tonnage curve does not include stockpiles.
Grade tonnage curves
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Exclusive Mineral Resource
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Geita				
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

The exclusive Mineral Resource at Geita consists of:

- The underground Mineral Resource (with the exception of Indicated Mineral Resource within the Nyankanga Block 5 and Star and Comet cuts 2 and 3 mine designs where an underground Ore Reserve has been declared)
- All open pit Mineral Resource that is located between the Ore Reserve pit shell (at a gold price of $1,100/oz) and the Mineral Resource pit shell (at a gold price of $1,400/oz)
- Material within the Ore Reserve pit shell that is Inferred Mineral Resource or falls below the Ore Reserve cut-off grade and above the Mineral Resource cut-off grade material within the Nyankanga Block 5 and Star and Comet Cuts 2 and 3 underground mine designs that is Inferred Mineral Resource

This material forms potential extensions to the current LOM if it can be converted to Ore Reserve. A significant portion of this material is in the Inferred Mineral Resource category and infill drilling programmes are planned to upgrade potentially economical areas to Indicated Mineral Resource.

Mineral Resource below infrastructure
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Geita				
Measured	–	–	–	–
Indicated	3.60	5.27	18.97	0.61
Inferred	14.43	4.78	68.97	2.22
Total	18.03	4.88	87.94	2.83

Any underground Mineral Resource for which there is neither an established portal nor significant underground infrastructure to access the Mineral Resource is reported as Mineral Resource below infrastructure. As such, all underground Mineral Resource with the exception of Nyankanga Block 5 and Star and Comet cuts 2 and 3 (which have established portals and significant development in place as at 31 December 2017) have been separately categorised as Mineral Resource below infrastructure.

Year-on-year changes in Mineral Resource

As at 31 December 2018, there is a decrease in comparison to the previous year's declaration. The significant movements are due to depletion and a loss due to a change in methodology for reporting material in the crown pillar. Previously, all material above the open pit cut-off grade in the crown pillar was reported as open pit Mineral Resource whereas, in 2017, only the material within an

GEITA CONTINUED

Geita is sensitive to a drop in gold price as it is transitioning from an open pit to an underground operation.

ORE RESERVE

Ore Reserve

as at 31 December 2018

Category	Tonnes	Grade	Contained gold	
	million	g/t	tonnes	Moz
Nyankanga (open pit) Cut 8				
Proved	–	–	–	–
Probable	4.27	5.28	22.55	0.72
Total	4.27	5.28	22.55	0.72
Stockpile (full grade ore)				
Proved	–	–	–	–
Probable	0.27	3.03	0.82	0.03
Total	0.27	3.03	0.82	0.03
Stockpile (marginal ore)				
Proved	–	–		

–
–
Probable
2.45
1.10
2.68
0.09
Total
2.45
1.10
2.68
0.09
Nyankanga (underground) Block 4
Proved
–
–
–
–
Probable
0.52
7.57
3.92
0.13
Total
0.52
7.57
3.92
0.13
Nyankanga (underground) Block 5
Proved
–
–
–
–
Probable
0.79
6.81
5.40
0.17
Total
0.79
6.81
5.40
0.17
Star and Comet (underground) Cut 2
Proved
–
–
–
–
Probable

0.41
5.78
2.35
0.08
Total
0.41
5.78
2.35
0.08
Star and Comet (underground) Cut 3
Proved
–
–
–
–
Probable
0.76
4.93
3.76
0.12
Total
0.76
4.93
3.76
0.12
Geita
Total
9.47
4.38
41.49
1.33
Inclusive Mineral Resource sensitivity
MSO shape, derived using higher underground cut-off grades, is reported as underground Mineral Resource. This was offset by a
small gain by including Inferred Mineral Resource previously excluded from the open pit optimisation at Matandani.

Estimation
The Mineral Resource models are used as the basis for Ore Reserve estimation. Input parameters for the estimation of the Ore
Reserve include gold price, mining dilution and recovery, geotechnical information, stay in business capital, operating costs,
metallurgical recovery, processing capacity and mining equipment capacities.
Appropriate Ore Reserve cut-off grades are applied and optimised pit shells are generated for the open pit sources. Pit designs are
then done on selected shells and signed off by all relevant parties to ensure compliance to specifications. Underground designs are
completed and evaluated. These designs are incorporated into the production and treatment scheduling stages to yield ore tonnes
and grades. Financial evaluations are completed for production and treatment schedules to check cash flow analysis from the
estimated Ore Reserve.
The Ore Reserve for Geita operating, prospective pits and underground mine areas were estimated using updated economic
factors, latest Mineral Resource models, geological, geotechnical, mining engineering and metallurgical parameters. The
environmental, socio-political, legal and regulatory factors are also considered.
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 %
Geita Hill (open pit)	1,100	1.50	90.0	100.0	103.0	77.0		

96.0
89.3
Nyankanga (open pit) Cut 7 and 8
1,100
1.45
95.0
100.0
105.0
95.0
96.0
92.7
Nyankanga (underground) Block 4
1,100
3.43
100.0
100.0
95.0
95.0
96.0
90.0
Nyankanga (underground) Block 5
1,100
2.72
100.0
100.0
95.0
95.0
96.0
90.0
Star and Comet (underground) Cut 2
1,100
2.54
100.0
100.0
95.0
95.0
96.0
86.6
Star and Comet (underground) Cut 3
1,100
1.85
100.0
100.0
95.0
95.0
96.0
77.8
Modifying factors are applied during the production scheduling stage with the aim of closely estimating the tonnes, grade and metal
that would be delivered to the ROM pad (i.e. Ore Reserve). The aim is to be able to fully account for all variance along the chain from

the Mineral Resource model to process plant received and gold produced. Dilution is included in MRF and a MCF of 96% is used.
During the year, Geita continued to implement various elements of mine to mill improvements supported with blast movement
tracking technology. The modifying factors considered are based on reconciliation, which is ongoing between Mineral Resource
models, grade control models, mine design perimeters, actual mining and plant feed, specifically on the open pits. Limited historic
data is available for the underground mine and the factors are based on recent drilling results from geology and from similar type
underground deposits and mining methods as suggested by underground planning experts in the group.
For the open pits, the MRF is applied during the production scheduling stage. Dilution is included in MRF. These factors are also
applied in the optimisation process, in the software package, to ensure the optimal selected shell reflects the impact of these factors.
The underground mines have the dilution and mining recovery losses separately applied during the production scheduling stage.
The MRF is estimated to cater for recovery losses from pillars and a further factor might be applied to cater for these pillars,
depending on if they are mined-out at a later stage or not during detailed pit designs and scheduling process.
The MCF is applied after the production scheduling stage for both open pit and underground in the treatment schedule. The
aim is to be able to fully account for all variance along the chain from the Mineral Resource model to process plant received and
gold produced.

Inferred Mineral Resource in business plan

No Inferred Mineral Resource is included in the final Ore Reserve reporting. However, Inferred Mineral Resource within the Ore Reserve pit shell is included in the business plan. This material forms potential extensions to the current LOM if it is converted to Ore Reserve and infill drilling programmes are planned to upgrade potentially economic areas to Indicated Mineral Resource. This accounts for not more than 10% of the business plan.

For Nyankanga, the Inferred Mineral Resource is not included in the pit optimisation and therefore does not contribute to the
economic assessment of the optimised pit. The Inferred Mineral Resource in business plan is present within the final pit shell as
exclusive Mineral Resource.

Inferred Mineral Resource is included in the Star and Comet underground mine design however is not included in the Ore Reserve
estimation process and therefore it does not contribute to the economic assessment of the underground Ore Reserve.

GEITA CONTINUED

As at 31 December 2018, there is a increase in comparison to the previous year’s declaration. Driven primarily by depletions offset
by the introduction of Nyankanga Block 4 underground Ore Reserve.

Year-on-year changes in Ore Reserve

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AUSTRALASIA

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LEGEND
1
Sunrise Dam
2
Tropicana (70%)
Operation
1,000km
0

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Key statistics	Units	2018	2017	2016
Operational performance				
Tonnes treated/milled	Mt	9.5	9.4	8.9
Recovered grade	oz/t	0.065	0.061	0.058
	g/t	2.01	1.89	1.82
Gold production (attributable)	000oz	625	559	520
Total cash costs	$/oz	762	743	793
Total production costs	$/oz	1,010	991	1,056
All-in sustaining costs (1)	$/oz	1,038	1,062	1,067
Capital expenditure (attributable)	$m	156	153	109

(1) Excludes stockpile write-offs

As at 31 December 2018, the total attributable Mineral Resource (inclusive of the Ore Reserve) for the Australasia region was 11.2Moz (2017: 11.2Moz) and the attributable Ore Reserve was 3.8Moz (2017: 4.0Moz).

This is equivalent to 6% and 9% of the group's Mineral Resource and Ore Reserve. Production from Australasia was steady at
625koz in 2018, equivalent to 18% of group production. AngloGold Ashanti operates two mines in Western Australia: Sunrise Dam,
which is wholly owned, and Tropicana gold mine, a JV with Independence Group NL, which holds a 30% stake.
REGIONAL OVERVIEW
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Inclusive Mineral Resource
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Australasia				
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

Exclusive Mineral Resource
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Australasia				
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
Ore Reserve
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
Australasia
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

SUNRISE DAM
INTRODUCTION
Property description
Sunrise Dam is an underground mine that is wholly owned by AngloGold Ashanti.
Location
Sunrise Dam is approximately 220km north-northeast of Kalgoorlie and 55km south of Laverton in Western Australia.
History
Open pit production began in 1997 and has now been completed at a final depth of 500m below surface. Underground mining commenced in 2003 with a number of different mining methods being applied, depending on the style of mineralisation and grade of the geological domain. By 2014, the mine was wholly an underground mining operation supplemented with stockpile processing.
Legal aspects and tenure
Sunrise Dam operates within two mining leases covering over 7,800ha, which are in good standing with the expiry dates in 2038. The Mineral Resource and Ore Reserve for the Sunrise Dam underground mine is contained within M39/1116. The Golden Delicious Mineral Resource is also contained within the M39/1116 mining lease. The lease M39/1116 also contains mine infrastructure, tailings stage facilities and stockpiles. There is a smaller mining lease M39/1117, which hosts water extraction infrastructure, and is used to supply the operation with water.
Mining method
Mining is carried out by underground mining contractors and productivity improvements over the past few years has seen total underground tonnages mined reach a steady state of around 3Mtpa. This has been possible by the use of bulk mechanised sub-level open stoping using stabilising pillars and waste back fill where possible. Paste fill will be re-introduced in selected areas from 2019 to improve ore recovery in the higher grade parts of the Vogue ore zone.
Operational infrastructure
All required surface infrastructure is in place including a fully functional camp, plant, power plant and reticulation, offices and road system. The underground mining infrastructure has been undergoing continuous upgrades with an extra power feed to the underground mine completed during 2017 and a major ventilation fan upgrade was completed in 2018.
Mineral processing
Ore is treated in a conventional gravity and CIL process plant. Installation of a new fine grind and otation circuit was completed in 2018.
Risks
The complexity of the Sunrise Dam mineralisation means that the largest risk associated with the calculation of the Ore Reserve is linked to the accuracy of the Mineral Resource. Design risk is low as the mining method has been practiced at Sunrise Dam for the past 10 years.
An independent external Mineral Resource and Ore Reserve audit was undertaken in 2018 and found no fatal flaws in process or output.
Competent Persons
Responsibility
Competent Person
Professional
organisation
Membership
number
Relevant
experience
Qualification
Mineral Resource
Fraser Clark

MAusIMM
226 390
17 years
BSc Hons (Geology), Postgraduate
Certificate in Geostatistics
Ore Reserve
Peter Merry
MAusIMM
306 163
16 years
BEng (Mining), GDE (Mining
Engineering)

Map showing Sunrise Dam infrastructure and licences
Plant centroid co-ordinates
122°26’18”E, 29°05’35”S
1
0
1
2km
Licences
Mining
Exploration
Exploration application
Mine infrastructure
Pits
Plant
ROM pad
TSF
Waste dumps
Underground access
Prospects
Golden Delicious
Roads
Main
Secondary
Lake Carey
Airfield
Village
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GEOLOGY

Deposit type

Sunrise Dam is considered to be a mesothermal gold deposit, typical of many orebodies found in the Archean greenstone belts of Western Australia.

Mineralisation style

At Sunrise Dam, gold mineralisation is structurally controlled and vein hosted. The style of mineralisation can be differentiated depending on the structure or environment in which it is hosted. There are three dominant styles recognised:

- Shear-related and high strain e.g. Sunrise Shear Zone
- Stockwork development in planar faults with brittle characteristics (these occur in all rock types and are commonly concentrated at contacts within the volcanic stratigraphy or the porphyry margin and within hinge positions within the magnetite shales) e.g. Cosmo, Dolly and Vogue orebodies
- Placer-style mineralisation hosted within the uvial sediments

Mineralisation characteristics

Mineralisation is typically hosted in quartz-carbonate veins and breccias with varying quantities of pyrite and arsenopyrite. Gold occurs as free gold and is also occulded in the sulphides. The gold mineralisation is often associated with strongly altered country rocks proximal to the shear and fracture network that the hydrothermal fluids have passed through.

N-S Long section of Sunrise Dam looking east, elevation in mRL

500 metres

Waste dump

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EXPLORATION

During 2018, the exploration plan was focused on Mineral Resource expansion and infill drilling. The Mineral Resource expansion drilling focused on drill testing the under explored portions of the mine at depth and along strike to supply additional Mineral Resource into the LOM plan.

Significant drill platforms have been established at the southern end of the mine to access the strike and depth extensions of the Vogue orebody. Strategic drill platforms have also been established to facilitate systematic exploration of the middle and northern regions of the property. The exploration drilling focused on the strike and down dip extensions of Vogue and also testing the southern extensions of the Carey Shear Zone. The Vogue drilling campaign has proven that the Mineral Resource continues to the south along strike and at depth. The Carey Shear remains open along strike and down-dip, providing significant upside potential as the exploration proceeds.

Mineral Resource development drilling took place concurrently and focused on infilling the lower part of the Vogue orebody to an Indicated Mineral Resource. In total the exploration activities added 690koz of gold to the Mineral Resource during the year.

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
10 x 10, 25 x 25
√
√
√
√
√
√
√
–
–
–
Indicated
40 x 20, 40 x 40
–
–
–
Inferred
40 x 40, 100 x 100
–

–
–
Grade/ore control
6 x 8, 10 x 10
–
–
–
–

The Measured Mineral Resource is drilled out to a 10 x 10m spacing. Indicated Mineral Resource is drilled out to a 20 x 40m
spacing. The Inferred Mineral Resource is drilled out to 40 x 40m spacing.

SUNRISE DAM CONTINUED

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The inclusive Mineral Resource includes measured stockpiles and all in-situ Measured, Indicated and Inferred Mineral Resource which meet the cut-off grade.

Estimation

Estimation of the underground Mineral Resource uses the geological model boundaries to subdivide all drill hole data into appropriate domains. The geostatistical method of ordinary block kriging is used to estimate the Mineral Resource. High-grade restraining is used to limit the effects of outlier grade values. Dense patterns of underground RC drilling are completed prior to the final mine design, upon which, grade control models are created using conditional simulation. This allows for the probabilistic determination of the optimal mining stope configuration.

Mining of the open pit Mineral Resource was completed during 2012 and mining of the crown pillar at the base of the pit finished in early 2014. Remaining stockpiled material is estimated based on detailed grade control drilling completed prior to mining. Grades were estimated by means of the conditional simulation geostatistical method.

The Golden Delicious deposit has been estimated using UC. All available geological drill hole information is validated for use in the models and the local geology of the deposit is used to classify the drill hole information into appropriate estimation domains.

Detailed statistical analyses are conducted on each of these domains and this allows for the identification of high-grade outliers.

If these values are anomalous to the characteristics of the general population they are then cutback to an appropriate upper limit for the population.

Inclusive Mineral Resource
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Golden Delicious				
Measured	0.66	1.47	0.97	0.03
Indicated	2.40	1.24	2.98	0.10
Inferred	0.02	0.89		

0.02
0.00
Total
3.09
1.29
3.97
0.13
Stockpile (open pit)
Measured
9.54
0.94
8.95
0.29
Indicated
–
–
–
–
Inferred
–
–
–
–
Total
9.54
0.94
8.95
0.29
Underground
Measured
24.72
2.26
55.80
1.79
Indicated
29.32
2.48
72.81
2.34
Inferred
17.21
2.30
39.67
1.28
Total
71.25
2.36
168.27
5.41
Stockpile (underground)
Measured

0.13
3.22
0.41
0.01
Indicated
–
–
–
–
Inferred
–
–
–
–
Total
0.13
3.22
0.41
0.01
Sunrise Dam
Total
84.00
2.16
181.60
5.84
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SECTION 4 / AUSTRALASIA

The grade tonnage curves do not include stockpiles.

Exclusive Mineral Resource
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Sunrise Dam				
Measured	22.42	2.16	48.45	1.56
Indicated	26.10	2.13	55.56	1.79
Inferred	14.90	2.10	31.31	1.01
Total	63.42	2.13	135.32	4.35

The exclusive Mineral Resource includes a large portion of the underground Measured and Indicated Mineral Resource as the material is of a lower-grade and therefore fails to meet Ore Reserve cut-off grade requirements, as well a small amount of Golden Delicious. The entire Inferred Mineral Resource in the underground mine is included in the exclusive Mineral Resource. Much of this Inferred Mineral Resource is located in the deeper parts of the underground mine where the drill density is not yet adequate for the Mineral Resource to be considered in the Ore Reserve estimation process.

SUNRISE DAM CONTINUED

Grade tonnage curves

The increase in Mineral Resource was largely due to successful exploration, as well a methodology changes in the estimation approach by calibrating the Mineral Resource estimate to the grade control estimates. The increase was offset by Mineral Resource depletion and sterilisation of material which cannot be accessed and mined around old stopes and pillars.

As a low grade underground mine, Sunrise Dam is sensitive to changes in gold price.

Year-on-year changes in Mineral Resource

Inclusive Mineral Resource sensitivity

Mineral Resource below infrastructure

as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Sunrise Dam				
Measured	–	–	–	–
Indicated	5.17	3.12	16.13	0.52
Inferred	9.64	2.37	22.89	0.74
Total	14.82	2.63	39.02	1.25

The Mineral Resource below infrastructure occurs below the 1,500mRL.

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SUNRISE DAM CONTINUED
ORE RESERVE
Ore Reserve
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
Stockpile (open pit)
Proved
9.54
0.94
8.95
0.29
Probable
–
–
–
–
Total
9.54
0.94
8.95
0.29
Underground
Proved
2.93
2.81
8.24
0.26
Probable
5.49
3.60
19.76
0.64
Total
8.42
3.32
27.99
0.90
Stockpile (underground)
Proved
0.13
3.22
0.41
0.01
Probable

–
–
–
–
Total
0.13
3.22
0.41
0.01
Sunrise Dam
Total
18.09
2.06
37.35
1.20
Estimation
The underground Ore Reserve is based on portions of the Mineral Resource model which were projected to be mineable based on
price, mining factors and mill recovery assumptions. The mining shapes are based on Indicated Mineral Resource materials that are
projected to provide a 15% margin on total cost, based on the reference assumptions. Mine layout and designs have been created
within mining shapes for each geological domain to calculate the Ore Reserve directly from the Mineral Resource model. The Proved
and Probable Ore Reserve was then defined by applying the Mineral Resource classification for each estimation domain.
Ore Reserve modifying factors
as at
31 December 2018
Gold
price
AUD/oz
Cut-off
grade
g/t Au
Dilution
%
Dilution
g/t
RMF
% (based
on tonnes)
RMF
% (based
on g/t)
MRF
% (based
on tonnes)
MRF
% (based
on g/t)

MCF
%
MetRF
%
Stockpile (open pit)
1,507
0.68
0.0
0.0
100.0
100.0
100.0
100.0
100.0
86.0
Stockpile
(underground)
1,507
2.71
7.0
0.3
100.0
100.0
99.0
99.0
100.0
87.0
Underground
1,507
2.71
7.0
0.3
100.0
100.0
99.0
99.0
100.0
87.0
There are no significant changes in the modifying factors used in the Ore Reserve as gold price, costs and mining performance were
fairly constant year-on-year.
Inferred Mineral Resource in business plan
as at 31 December 2018
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
Underground

2.34
3.58
8.38
0.27
Total
2.34
3.58
8.38
0.27
The Inferred Mineral Resource in the business plan includes extensions of all geological domains. This accounts for 6% of the
business plan. Further exploratory drilling during 2019 is planned with the aim of increasing confidence in these areas to bring them
into the Ore Reserve.
Ore Reserve below infrastructure
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
Sunrise Dam
Proved
–
–
–
–
Probable
1.29
3.85
4.95
0.16
Total
1.29
3.85
4.95
0.16
The Ore Reserve below infrastructure occurs below the 1,500mRL.
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Year-on-year changes in Ore Reserve are due mainly to depletions offset by exploration activities.
Year-on-year changes in Ore Reserve
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TROPICANA

INTRODUCTION

Property description

Tropicana is comprised of a number of open pits that are operated as a JV between AngloGold Ashanti (70%), which manages the operation and Independence Group NL (30%).

Location

Tropicana is located 200km east of Sunrise Dam and 330km east-northeast of Kalgoorlie, Western Australia. Tropicana is the first deposit discovered in this remote portion of the Great Victoria Desert.

History

Open pit mining began during 2012 with first gold production occurring during September 2013. Tropicana reached the 2Moz produced milestone during the Q1 2018.

Legal aspects and tenure

Tropicana has security of tenure for all current exploration licences and the mining lease that covers its future Ore Reserve. This lease is M39/1096 which is valid from 11 March 2015 to 10 March 2036 covering a total area of 27,228ha.

The previous 31 mining leases comprising the 27,228ha (including M39/980, M39/981, M39/982 and M39/1052), were conditionally surrendered in favour of the grant of the single mining lease M39/1096 on 11 March 2015 for 21 years with all existing rights and obligations preserved. This process was completed with the co-operation of the Department of Mines and Petroleum.

Mining method

Mining activities are undertaken by Macmahon in an alliance partnership with AngloGold Ashanti. Mining is conventional open cut, drill and blast, followed by truck and excavator operation to develop the deposits (Havana, Havana South, Tropicana and Boston Shaker). The total annual movement of ore and waste is approximately 95Mtpa.

Operational infrastructure

All infrastructure facilities are in place and operational. The processing plant and TSF are operating well, consistent with design specifications. The infrastructure includes, but is not limited to, a dedicated gas and diesel power station, water supply, processing plant, mine, dewatering infrastructure, tailing dump facility, workshops, camp facilities and airstrips.

Mineral processing

The processing plant comprises crushing, high pressure grinding rolls, one stage grinding and CIL recovery and a capacity of 7.6 to 8.1Mtpa.

Risks

No material risks identified.

Competent Persons

Responsibility	Competent Person	Professional organisation	Membership number	Relevant experience	Qualification
Mineral Resource	Damon Elder	MAusIMM	208 240	22 years	BSc Hons (Geology)
Ore Reserve (surface)					

Steven Hulme
MAusIMM
220 946
8 years
BSc (Mining), Graduate Diploma
(Mining)
Ore Reserve (underground) Jeff Dang
MAusIMM
307 499
11 years
BEng Hons (Mining)

GEOLOGY

Deposit type

The Tropicana Gold Project area lies east of a north-east trending magnetic feature, interpreted to be the major tectonic suture between the Yilgarn Craton and the Proterozoic Albany-Fraser Orogen that extends over 700km. The gold deposit is hosted in Archean gneissic metamorphic rocks (ca. 2,640Ma) with cover sequences generally 10 to 30m thick resulting in the mineral deposit not being exposed at surface.

Together, the Tropicana, Havana, Havana South and Boston Shaker deposits define a north-east trending mineralised corridor, approximately 1.2km wide and 5km long, that has been tested to a vertical depth of more than 1,200m. The Mineral Resource remains open down-dip from the Tropicana, Havana and Boston Shaker deposits and has the potential to be extended to the north and south. Neither the immediate metamorphic host rocks nor the mineralised zones are exposed at surface due to the presence of widespread younger cover sequences of between 0.5m and 15m thick.

Mineralisation style

The Tropicana deposit comprises a mineralised zone up to 50m thick, hosted predominantly in quartzo-feldspathic gneiss with a garnet-gneiss dominated hangingwall package. The mineralisation is comprised of subordinate thin (3 to 5m), discontinuous mineralised lenses that typically return intercepts of >0.5g/t gold. The Havana deposit comprises a lower, laterally continuous, higher-grade lode up to 50m thick that is overlain, in the central and southern parts of the proposed pit, by stacked, typically lower-grade and thinner (up to 25m thick) mineralised zones. Havana is also dominantly hosted in quartzo-feldspathic gneiss, again with a garnet gneiss dominated hangingwall.

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

1
0
1
2km
Licences
Mining
Exploration
Mine infrastructure
Pits
Plant
ROM pad
Stockpiles
TSF
Waste dumps
Settlements
Villages
Roads
Main
Secondary
Airfield
Insert
Total mining lease area
Map zoomed in area
Plant centroid co-ordinates
124°32’25”E, 29°14’25”S
Total mining lease area
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TROPICANA CONTINUED

S-N View of the both open pit and underground Mineral Resource over the strike length of Tropicana

0.3g/t Wireframe

2.8g/t Grade shell

Mineralisation characteristics

Mineralisation is accompanied by pyrite (2% to 8%) with accessory pyrrhotite, chalcopyrite and other minor sulphides and tellurides.

The gold mineralisation is related to shear planes that postdate the main gneissic fabric developed during peak granulite-facies
metamorphism.

1km

NW-SE Geological cross-section through Havana pit, elevation in metres relative to average mean sea level
EXPLORATION
During 2018, Tropicana JV brownfields exploration programmes included Mineral Resource development drilling and near mine
exploration drilling. Mineral Resource development drilling completed infill drilling at Boston Shaker, Havana, Havana South and
Tropicana was designed to increase Mineral Resource confidence. Following extensional drilling at Boston Shaker which identified
underground mining potential in 2017, underground extensional drilling programmes continued in 2018 defining an underground
Mineral Resource.
Near mine exploration programmes explored for potential open pit satellite Mineral Resource, within 60km of the mine. They
comprised a mix of advanced and early stage exploration using DD, RC and AC drilling. The programmes are testing prospects
such as Madras, New Zebra, Angel Eyes and Southern Traverses following a comprehensive target generation exercise in through
2017. The results of the 2018 exploration drilling and ongoing targeting work provide a comprehensive pipeline of exploration
targets with focus on near mine exploration going forward into 2019.
PROJECTS
The Tropicana JV has implemented a cutback staging strategy, effectively increasing production from the mine in the medium term
and extending the mine life.
The installation of a second ball mill in the Tropicana processing plant grinding circuit was completed and commissioned in late
2018. The 6MW ball mill will enable the annual throughput rate to be lifted to approximately 8.2Mtpa and deliver an expected
increase in gold metallurgical recovery of up to 3% through a reduction in grind size. The increased throughput will efficiently match
processing capacity to the increased mining rate (~95Mtpa), and effectively bring forward gold production delivering the best
production profile for the operation.
Through 2018, the Boston Shaker underground Mineral Resource was evaluated in the Boston Shaker underground PFS,
progressed to a FS in late 2018, which will be concluded in early 2019.
Legend
500m
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TROPICANA 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
25 x 25
√
√
√
√
–
–
–
Indicated
20 x 50, 50 x 50
–
–
–
Inferred
100 x 100
–
–
–
Grade/ore control
12 x 12
√
√
√
–
–
–
–
Inclusive Mineral Resource
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
Boston Shaker Stage 4 – BS04
Measured

0.00
0.93
0.00
0.00
Indicated
2.45
1.86
4.55
0.15
Inferred
0.00
0.39
0.00
0.00
Total
2.45
1.86
4.55
0.15
Boston Shaker Stage 3 – BS03
Measured
0.42
1.66
0.70
0.02
Indicated
2.18
1.98
4.34
0.14
Inferred
–
–
–
–
Total
2.61
1.93
5.04
0.16
Havana Stage 3 – HA03
Measured
0.59
2.47
1.45
0.05
Indicated
4.12
1.80
7.42
0.24

Inferred
–
–
–
–
Total
4.71
1.89
8.87
0.29
Havana Stage 4 – HA04
Measured
0.04
1.14
0.05
0.00
Indicated
6.42
1.68
10.77
0.35
Inferred
–
–
–
–
Total
6.46
1.67
10.82
0.35
Havana Stage 5 – HA05
Measured
–
–
–
–
Indicated
6.68
1.76
11.78
0.38
Inferred
–
–
–
–
Total
6.68
1.76
11.78

0.38
Havana Stage 6 – HA06
Measured
–
–
–
–
Indicated
8.45
1.66
14.05
0.45
Inferred
–
–
–
–
Total
8.45
1.66
14.05
0.45
Havana South Stage 1 – HS01
Measured
3.48
1.05
3.64
0.12
Indicated
8.39
1.18
9.87
0.32
Inferred
–
–
–
–
Total
11.86
1.14
13.51
0.43
Havana South Shell
Measured
–
–
–
–
Indicated
13.51

1.12
15.10
0.49
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Inclusive Mineral Resource continued
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
Inferred
3.91
1.31
5.13
0.16
Total
17.42
1.16
20.23
0.65
Tropicana Stage 2 – TP02
Measured
–
–
–
–
Indicated
0.67
2.03
1.36
0.04
Inferred
–
–
–
–
Total
0.67
2.03
1.36
0.04
Tropicana stockpile (open pit)
Measured
19.45
0.79
15.34
0.49
Indicated
–
–
–

–
Inferred
–
–
–
–
Total
19.45
0.79
15.34
0.49
Boston Shaker (underground)
Measured
–
–
–
–
Indicated
3.55
4.08
14.50
0.47
Inferred
5.23
4.35
22.73
0.73
Total
8.78
4.24
37.23
1.20
Tropicana (underground)
Measured
–
–
–
–
Indicated
1.16
3.59
4.16
0.13
Inferred
0.21
3.66
0.78
0.03
Total
1.37
3.60

4.94
0.16
Havana (underground)
Measured
–
–
–
–
Indicated
1.07
4.64
4.97
0.16
Inferred
2.76
4.30
11.88
0.38
Total
3.83
4.40
16.85
0.54
Havana South (underground)
Measured
–
–
–
–
Indicated
0.14
5.06
0.73
0.02
Inferred
0.45
5.15
2.32
0.07
Total
0.59
5.12
3.04
0.10
Tropicana
Total
95.34
1.76
167.62
5.39
Estimation

All available geological drill hole information is validated for use in the models and the local geology of the deposit is used to classify
the drill hole information into appropriate geostatistical domains. Detailed statistical analyses are conducted on each of these
domains. The recoverable gold Mineral Resource for the open pit is estimated by LUC. Conventional UC which estimates the
proportion of material recovered by mining above a cut-off grade, assuming a specified SMU, LUC goes a step further to position
the SMU block within the estimated panel based on the most likely position of the higher grade SMU blocks relative to the lower
grades SMU blocks.
The underground Mineral Resource estimate uses all available drilling targeting the down plunge and along strike extents of the
mineralisation, outside the current open pits and open pit Mineral Resource shells, and is estimated by LUC.
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The grade tonnage curves do not include stockpiles.

Exclusive Mineral Resource
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Tropicana				
Measured	10.15	0.52	5.28	0.17
Indicated	26.66	1.43	38.10	1.22
Inferred	12.56	3.41	42.83	1.38
Total	49.37	1.75	86.21	2.77

The exclusive Mineral Resource includes Inferred Mineral Resource at depth in the designed pits and Mineral Resource shells, as well as the portions of underground Mineral Resource, which are not yet drilled to a level of confidence to support an Ore Reserve.

Mineral Resource below infrastructure
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Tropicana				
Measured	–	–	–	

–
Indicated
5.93
4.11
24.35
0.78
Inferred
8.65
4.36
37.71
1.21
Total
14.58
4.26
62.06
2.00
All of the underground Mineral Resource is below infrastructure as no development has yet taken place or is currently planned.
TROPICANA CONTINUED
Year-on-year changes in Mineral Resource
Grade tonnage curves
Addition through exploration success at Boston Shaker underground offset depletion. The Havana South underground Mineral
Resource was adjusted in-line with updated Mineral Resource shell optimisation.
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The open pit Mineral Resource is sensitive to gold
price changes in Havana South. In other areas,
the pit designs are fixed based on the current
business plan.
ORE RESERVE
Ore Reserve
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
Boston Shaker Stage 4 – BS04
Proved
0.00
1.62
0.00
0.00
Probable
1.84
2.29
4.22
0.14
Total
1.84
2.29
4.22
0.14
Boston Shaker Stage 3 – BS03
Proved
0.33
1.97
0.65
0.02
Probable
1.83
2.25
4.12
0.13
Total
2.16
2.21
4.77
0.15
Havana Stage 3 – HA03
Proved
0.53
2.69

1.42
0.05
Probable
3.45
2.03
7.00
0.22
Total
3.98
2.11
8.41
0.27
Havana Stage 4 – HA04
Proved
0.03
1.29
0.04
0.00
Probable
5.05
1.97
9.93
0.32
Total
5.08
1.96
9.97
0.32
Havana Stage 5 – HA05
Proved
–
–
–
–
Probable
5.49
2.00
10.99
0.35
Total
5.49
2.00
10.99
0.35
Havana Stage 6 – HA06
Proved
–
–
–
–
Probable

6.49
1.98
12.87
0.41
Total
6.49
1.98
12.87
0.41
Havana South Stage 1 – HS01
Proved
2.07
1.38
2.85
0.09
Probable
5.47
1.49
8.16
0.26
Total
7.54
1.46
11.00
0.35
Stage 2 – TP02
Proved
–
–
–
–
Probable
0.62
2.13
1.33
0.04
Total
0.62
2.13
1.33
0.04
Stockpile (open pit)
Proved
10.87
1.01
10.95
0.35
Probable
–
–
–

–
Total
10.87
1.01
10.95
0.35
Boston Shaker (underground)
Proved
–
–
–
–
Probable
1.89
3.65
6.89
0.22
Total
1.89
3.65
6.89
0.22
Tropicana
Total
45.97
1.77
81.41
2.62
Inclusive Mineral Resource sensitivity
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TROPICANA CONTINUED

Estimation

The Ore Reserve for Tropicana is based on an operating LOM plan and a PFS. For the operating LOM plan, a FS was completed in 2010, which determined a technically achievable and financially economic mine plan. The pits that make up the operating LOM plan are Tropicana, Havana, Boston Shaker and Havana South. The PFS studies were based on an expansion of Havana and the Boston Shaker underground project. All Ore Reserve is estimated by reporting physicals (volumes, tonnes, grades, material types, etc) against the Mineral Resource model within detailed staged pit designs. Ore Reserve physicals are then scheduled and put through a financial model for economic evaluation.

Ore Reserve modifying factors

as at 31 December 2018

	Gold price AUD/oz	Cut-off grade g/t Au	MCF %	MetRF %
Surface	1,509	0.70	100.0	90.0
Stockpile (open pit)	1,509	0.70	100.0	90.0
Underground	1,509	3.17	100.0	89.9

The metallurgical recovery is based upon historic performance of the process plant to date. This is the only factor applied in the Ore Reserve estimation process. Mining selectivity was accounted for during the Mineral Resource estimation process, which produced a diluted Mineral Resource model. Consequently, no further adjustment was made and 100% mining recovery and no grade dilution were assumed during the Ore Reserve estimation process. The diluted Mineral Resource model is regularly reconciled against operating performance.

Changes in the Ore Reserve are mainly due to the addition of the Boston Shaker underground project and depletion during 2018 operations. Through optimisation of the business plan a scope change from strip mining to conventional cutbacks extraction method returns the plan to well under-stood costs and methodology minimising any potential risks whilst focussing on bulk mining methods.

Year-on-year changes in Ore Reserve

Inferred Mineral Resource in business plan

as at 31 December 2018

	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Boston Shaker (underground)	2.69	4.03	10.85	0.35
Total	2.69	4.03	10.85	0.35

All Mineral Resource categories, including the Inferred Mineral Resource, were included in the business plan but the Inferred Mineral Resource was excluded from the Ore Reserve. It is noted that there is an insignificant percentage of Inferred Mineral Resource (approximately 0.1% by tonnage) within the pit designs used.

Ore Reserve below infrastructure

as at 31 December 2018

	Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Tropicana	Proved	–	–	–	–
	Probable	1.89	3.65		

6.89
0.22
Total
1.89
3.65
6.89
0.22
All the underground Boston Shaker Ore Reserve is below infrastructure as no development has yet taken place or is currently
planned.
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0
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REGIONAL OVERVIEW

Key statistics

	Units	2018	2017	2016
Operational performance				
Tonnes treated/milled	Mt	6.8	7.5	7.0
Recovered grade	oz/t	0.103	0.102	0.106
	g/t	3.55	3.49	3.64
Gold production (attributable)	000oz	776	840	820
Total cash costs	$/oz	624	638	578
Total production costs	$/oz	875	973	909
All-in sustaining costs (1)	$/oz	855	943	875
Capital expenditure	$m	176	234	225

(1) Excludes stockpile write-offs

The Americas region incorporates two mining jurisdictions, Brazil and Argentina, and advanced project development programmes

in Colombia. As at 31 December 2018, the total attributable Mineral Resource (inclusive of the Ore Reserve) for the Americas region
was 57.5Moz (2017: 56.9Moz) and the attributable Ore Reserve was 7.1Moz (2017: 5.1Moz).
This is equivalent to 31% and 16% of the group’s Mineral Resource and Ore Reserve respectively. Combined production for the
Americas was 776koz in 2018, equivalent to 23% of group production.
AngloGold Ashanti has three operations in the Americas, the Cerro Vanguardia Mine in Argentina (AngloGold Ashanti 92.5% and
Formicruz 7.5%), AngloGold Ashanti Córrego do Sítio Mineração operations (referred to as AGA Mineração) which includes the Cuiabá,
Lamego and Córrego do Sítio (CdS) Mines and Serra Grande, both in Brazil, and advanced project development programmes in Colombia.
The projects in Colombia form a significant contribution to AngloGold Ashanti’s Mineral Resource with the three projects, La Colosa,
Quebradona (AngloGold Ashanti 94.876% and B2Gold 5.124%) and Gramalote (AngloGold Ashanti 51% and B2Gold 49%)
contributing 37.1Moz.
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REGIONAL OVERVIEW CONTINUED

Gold

Inclusive Mineral Resource
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Americas				
Measured	30.33	5.12	155.29	4.99
Indicated	1,204.13	0.91	1,095.22	35.21
Inferred	657.33	0.82	536.86	17.26
Total	1,891.79	0.94	1,787.38	57.47

Exclusive Mineral Resource
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Americas				
Measured	17.29	6.02	104.12	3.35
Indicated	1,017.63			

0.86
879.00
28.26
Inferred
654.55
0.81
529.73
17.03
Total
1,689.48
0.90
1,512.85
48.64
Ore Reserve
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
Americas
Proved
11.24
2.75
30.90
0.99
Probable
186.94
1.02
191.14
6.15
Total
198.18
1.12
222.04
7.14
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Copper

Inclusive Mineral Resource
as at 31 December 2018

Category	Tonnes million	Grade %Cu	Contained copper tonnes million	Contained copper pounds million
Americas				
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

Exclusive Mineral Resource
as at 31 December 2018

Category	Tonnes million	Grade %Cu	Contained copper tonnes million	Contained copper pounds million
Americas				
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
Ore Reserve
as at 31 December 2018
Category
Tonnes
million
Grade
%Cu
Contained copper
tonnes million pounds million
Americas
Proved
–
–
–
–
Probable
104.05
1.21
1.26
2,769
Total
104.05
1.21
1.26
2,769
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ARGENTINA

AngloGold Ashanti has a single operation in Argentina, the Cerro Vanguardia Mine, which is a JV with Formicruz (a state company operating in the province of Santa Cruz). Formicruz holds a 7.5% interest in the mine, with the remaining 92.5% belonging to AngloGold Ashanti. Production is from both underground and open pit mining and is fed either into a Merrill Crowe plant or onto a heap-leach.

Argentina – Cerro Vanguardia

Inclusive Mineral Resource
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
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

Exclusive Mineral Resource
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
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
Ore Reserve
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
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
LEGEND
1
Cerro Vanguardia (92.5%)
Operation
1,000km
0
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CERRO VANGUARDIA

INTRODUCTION

Property description

Cerro Vanguardia is a gold-silver mine with multiple open pit and underground mines, located within the property but mined simultaneously. AngloGold Ashanti has a 92.5% stake in Cerro Vanguardia, the company's sole operation in Argentina, with Fomicruz, a state company operating in the province of Santa Cruz, owning the remaining 7.5%. The climate is semi-arid and although snow is not rare, winter is mild and exploration activities are normally possible all year round.

Location

Cerro Vanguardia is located in Santa Cruz province, southern Patagonia, Argentina, approximately 110km north-northwest of the coastal town of Puerto San Julian. Access to the area is by aircraft from Buenos Aires to Comodoro Rivadavia (380km) or Rio Gallegos (510km) and then by road to the mine site.

History

Gold exploration at the site was started in late 1980s by the state owned Fomicruz and Minera Mincorp (JV between Anglo American Argentina Holdings Limited and a local private company Perez Companc). Cerro Vanguardia commenced as an open pit operation in 1998 and this was supplemented in 2010 with the start of shallow underground mining to access high-grade material. To complement the already existing gold plant, a heap-leaching operation was started in 2012. The mine has been operated by AngloGold Ashanti since 1998.

Legal aspects and tenure

The mining lease encompasses an area of approximately 543km^2. The licence 402642/CV/97 covers the full Ore Reserve and was issued on 27 December 1996 and expires on 26 December 2036.

Mining method

Cerro Vanguardia uses a conventional open pit mining method with a doubled bench height of 20m and in the underground, longhole stoping. Open pit mining is distributed between multiple operating pits, typically 5 to 10 at any one time, depending on the plant feed requirements. Currently, there are four underground mines which are operated at the same time, located at the Fortuna, Osvaldo 8, Veronica and Zorro veins. Three more are in development (Liliana, Serena and Cuncuna). The underground workings, which began production in 2010, account for around 30% of total production, a percentage that will increase in the next few years. Low-grade material is stockpiled and processed by heap-leaching.

Operational infrastructure

Most of the infrastructure is located on site. It includes a camp site with capacity for more than 1,000 people, Merrill Crowe plant, heap-leaching facilities, cyanide recycling plant, mine laboratory, maintenance facilities, warehouses and sewage processing plant. Four natural gas power generators fed by a 40km long pipeline provide electricity to the operation.

Natural gas is also used for heating. Mine office facilities are conveniently located in the main mining area. Dewatering supplies water for use both as processing water and camp consumption. Due to the particular features of the mine, and in order to optimise hauling, all pits have local single or multiple waste dumps. The tailings dam is located in, and is contained by a natural depression.

Mineral processing

Waste dumps and heap-leach stockpiles are located adjacent to each pit. Plant grade ore feed is trucked to either the long-range or the short-range stockpiles in order to smooth out the head grades and avoid recovery losses due to higher than planned silver grades.

The metallurgical plant has a daily capacity of 3,000t and includes a cyanide recovery facility. Production capacity of the heap-leach facility, which was commissioned in Q4 2012 and processes lower-grade material, is around 2.0Mtpa at gold and silver grades of around 0.65g/t and 17g/t respectively.

Risks

The Mineral Resource and Ore Reserve is sensitive to gold and silver prices as well as to local

exchange rate fluctuations. The low grades from the open pits and dif cult hydrogeological and geotechnical conditions for underground are on-going risks that are managed on a day-to-day basis. An independent external Mineral Resource and Ore Reserve audit was undertaken in 2018 and found no fatal aws in process or output.
Competent Persons

Responsibility	Competent Person	Professional organisation	Membership number	Relevant experience	Qualification
Mineral Resource	Juan Paredes	MAusIMM	227 738	22 years	PhD (Geology)
Ore Reserve	Javier Santillan	MAusIMM	319 366	15 years	BSc (Mining Engineering)

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Map showing Cerro Vanguardia Mine infrastructure and licences with the total mining lease area insert shown in the top right-hand corner
0
1.5
3km
Licences
Mining
Exploration
Mine infrastructure
Pits
Plant
ROM pad
Stockpiles
Leach pad
TSF
Waste dumps
Underground access
Roads
Main
Secondary
Airfield
Insert
Total mining lease area
Map zoomed in area
Plant centroid co-ordinates
68°15’46”W, 48°23’08”S
Total mining lease area
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CERRO VANGUARDIA CONTINUED

GEOLOGY

The Cerro Vanguardia district is located within the southern Deseado Massif in the Santa Cruz province of Patagonia, Argentina.

The Deseado Massif is an extensive rhyolite province of Middle to Upper Jurassic age. The most important geological feature in the Deseado Massif is an extended plateau formed by pyroclastic, epiclastic and extrusive rocks which were part of a strong explosive volcanic event associated with regional extensional tectonics developed during the Middle Upper Jurassic and related to the opening of the Atlantic Ocean. The rocks representing this magmatism are termed the Bajo Pobre Formation and Bahia Laura Group. The Bajo Pobre Formation comprises andesites, basalts and mafic volcanic agglomerates. The Bahia Laura Group includes both the Chon Aike Formation (ignimbrites, tuffs, volcanic breccias, agglomerates, lavas and domes) and the La Matilde Formation (tuffs and epiclastic volcanics interlayered with ignimbrites).

Deposit type

The Middle-Upper Jurassic ignimbrites and volcanic rocks from Chon Aike Formation host the low-sulphidation epithermal gold and silver deposit. The thickness of the ignimbrite sequence is estimated to have exceeded 1,000m but some lateral variations have been identified across the district. Epithermal Au-Ag bearing structures cut across all Jurassic rocks in the stratigraphy. The two main ignimbrite units, the Masiva-Lajosa and Granosa, host the majority of the mineralised veins.

The Masiva-Lajosa ignimbrite occurs at the top of the sequence while the Granosa ignimbrite occurs towards the bottom. These two ignimbrites are separated by two thinner, polymictic ignimbrite units (Brechosa and Brechosa Base) and a sequence of stratified crystal to ash-rich tuffs (Estratificada unit). The base of the sequence is a mixed unit of stratified ignimbrite intercalated with fine-grained tuffs (Estratificada Inferior ignimbrite).

Mineralisation style

Cerro Vanguardia is located in the core of the 60,000km^2 Deseado Massif, one of the most extensive volcanic complexes in southern Patagonia. The Deseado Massif is an extensive rhyolite province of Middle to Upper Jurassic age deposited over Paleozoic low-grade metamorphic basement rocks. These rocks are exposed in erosional windows through overlying Cretaceous sediments and Tertiary to Quaternary basalts. The orebodies comprise a series of low-sulphidation epithermal vein deposits containing gold and large quantities of silver which is produced as a by-product.

Mineralisation characteristics

The mineralisation is concentrated in steeply-dipping quartz veins that cut the at-lying ignimbrites and volcanoclastic rocks.

The Cerro Vanguardia district contains around 100 gold and silver-bearing epithermal veins for a cumulative exposed vein strike extension of more than 240km, of which 57 veins are currently known to contain economic gold and silver mineralisation.

The veins at Cerro Vanguardia consist mainly of quartz and adularia and contain minor electrum, native gold, silver sulphides and
native silver as fine-grained disseminations. Vein textures are mainly characterised by colloform-crustiform banding, pseudomorphic
quartz-lattice textures, massive-to-vuggy quartz veins and vein breccias.
40
Ar/
39
Ar dating on adularia from the Osvaldo Diez vein
yielded ages of around 153Ma while the age of the thick sequence of ignimbrites hosting the veins has been dated between 166Ma
to 150Ma.

EXPLORATION

The annual diamond drilling programme totaled 8,617m, yielding 0.155M new gold ounces (Veins + Stockworks) and 4.2M
new silver ounces in veins such as Atila 2, Atila Sur, Concepcin, Jani, Joana, Osvaldo Diez, Oveja, Potrero, Sandra, Teresa and
Vanguardia 3. An extensive trenching programme was carried out mainly in the north and south parts of the district, excavating
309 new trenches totalling 21,788m. 355 channels were cut in trenches and outcrops of 33 different veins, with a total length of
9,683m. 56km of ground magnetics were surveyed, covering the geologically more interesting sectors of the south, southwest and
the northern district, in areas such as Atila, Cuncuna, Dora, El Lazo, Molino-Vbora, Norma, Teresa, El Trio Norte, over the gravels
in the south and over the eastern boundary of the Cerro El Uno basaltic plateau in the southwest. 3.19km of Horizontal Loop
Electromagnetic (HLEM) surveys were carried out over Carmela, Osvaldo Diez Sur and Teresa veins, and also in the new Condor
area located nearby, several kilometres northwest NW of the Cerro Vanguardia district.

PROJECTS

An exploration project has been initiated focusing on the generation of new Mineral Resource to replace mining depletion. This will
be achieved through the identification and delineation of high grade orebodies at depth and along strike of known mineralisation
and generative exploration work using geophysics and geochemistry looking for new ore shoots in the veins of the central, north
and south.

During 2018, 1,200ha were added in a new mining property from Fomicruz in the northwest portion of the Cerro Vanguardia mining
properties. This is an exploration agreement between Fomicruz and Cerro Vanguardia.

W-E Geological cross-section of the Atila vein at Cerro Vanguardia, elevation in metres relative to sea level

E

W

Legend

Masiva Lajosa Ignimbrite

Brechosa Ignimbrite

Estratificada Sup Ignimbrite

Granosa Ignimbrite

Vein

200 Elev

200 Elev

100 Elev

100 Elev

0 Elev

0 Elev

100m

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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
6 x 20, 12 x 5
–
–
Indicated
40 x 40
–
–
Inferred
80 x 80
–
–
Grade/ore control
6 x 10, 12 x 5
–
–
Inclusive Mineral Resource
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
Vein (open pit)
Measured
1.13
4.15
4.68
0.15
Indicated
7.49
4.47
33.51
1.08
Inferred
2.09
3.52
7.35

0.24
Total
10.71
4.25
45.54
1.46
In situ heap leach stockwork material
Measured
2.55
0.66
1.68
0.05
Indicated
10.86
0.61
6.63
0.21
Inferred
2.15
0.73
1.57
0.05
Total
15.57
0.63
9.88
0.32
Heap leach stockpiles
Measured
3.57
0.51
1.83
0.06
Indicated
–
–
–
–
Inferred
–
–
–
–
Total
3.57
0.51
1.83
0.06
Vein (underground)
Measured
2.11

5.58
11.81
0.38
Indicated
2.60
6.70
17.39
0.56
Inferred
0.37
6.39
2.39
0.08
Total
5.08
6.21
31.59
1.02
Cerro Vanguardia
Total
34.93
2.54
88.85
2.86
Inclusive Mineral Resource by-product: silver
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained silver
tonnes
Moz
Cerro Vanguardia
Measured
9.37
47.30
443
14.24
Indicated
20.95
67.70
1,419
45.61
Inferred
4.61
111.73
516
16.58
Total

34.93
68.05
2,377
76.43
Estimation
The mineralisation boundaries for each geological entity (veins, stockwork and wall rock) are defined from the detailed logging of
all geological drill holes. This data is validated and the information used to create a 3D model with cell sizes of 5 x 25 x 5m block.
Volumetric measurements of the deposit are then determined using relevant block dimensions. Ordinary kriging is used to perform
grade interpolation and field tests are conducted to determine appropriate in situ densities.
Conditional simulations are performed in the main deposits for uncertainty assessment and the Mineral Resource is then classified
into Measured, Indicated and Inferred Mineral Resource categories according to the internal AngloGold Ashanti guidelines. For the
veins where simulations are not done, drill density is used to classify the Mineral Resource.
CERRO VANGUARDIA
CONTINUED
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Grade tonnage curves

The grade tonnage curves do not include stockpiles.

Exclusive Mineral Resource

as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Cerro Vanguardia				
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

The exclusive Mineral Resource is primarily located between the pit design and the Mineral Resource shell and exists due to the difference in the economic parameters that have been used.

Where the grades of gold and silver are above the Mineral Resource cut-off but below the Ore Reserve cut-off, significant zones of exclusive Mineral Resource will be generated. Very deep Mineral Resource will not be converted in the near term to Ore Reserve and is therefore listed as exclusive Mineral Resource.

CERRO VANGUARDIA
CONTINUED

The Mineral Resource is highly sensitive to changes in gold price on the upside. A great deal of low-grade material is present in the deposit which is reflected in the large tonnage increase and grade decrease at elevated gold prices.

Inclusive Mineral Resource sensitivity

Year-on-year changes are due to depletion offset by positive changes due to methodology and costs.

Year-on year-changes in Mineral Resource

Mineral Resource below infrastructure
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Cerro Vanguardia				
Measured	–	–	–	–
Indicated	–	–	–	–
Inferred	0.37	6.39	2.39	0.08
Total	0.37	6.39	2.39	0.08

All the Inferred Mineral Resource that has no ramp designed as yet is considered to be below infrastructure.

ORE RESERVE
Ore Reserve
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
Vein (open pit)
Proved
1.05
3.56
3.75
0.12
Probable
2.78
4.65
12.91
0.42
Total
3.83
4.35
16.66
0.54
In situ heap leach stockwork material
Proved
0.98
0.51
0.49
0.02
Probable
5.34
0.44
2.36
0.08
Total
6.32
0.45
2.85
0.09
Heap leach stockpiles
Proved
3.57
0.51
1.83
0.06
Probable
–

–
–
–
Total
3.57
0.51
1.83
0.06
Vein (underground)
Proved
2.11
5.58
11.81
0.38
Probable
0.02
6.93
0.15
0.00
Total
2.14
5.60
11.95
0.38
Cerro Vanguardia
Total
15.86
2.10
33.30
1.07
Ore Reserve by-product: silver
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained silver
tonnes
Moz
Cerro Vanguardia
Proved
7.72
61.92
478
15.36
Probable
8.14
66.12
538
17.31

Total
15.86
64.08
1,016
32.68
Estimation
The appropriate Mineral Resource models are used as the basis for estimating the Ore Reserve. All relevant modifying factors
such as mining dilution and costs are used in the Ore Reserve conversion process. This is based on the original block grades and
tonnage and includes waste material (both internal and external). Appropriate Ore Reserve cut-off grades are applied and all blocks
above this cut-off are reported.
It is important to emphasise the importance of silver during the optimisation of the pits, since silver is a significant by-product at
Cerro Vanguardia. The ratio of silver to gold commonly ranges from 20g/t to 30g/t of silver per 1g/t of gold.
Ore Reserve depletion includes material that comes from the operational dilution, which constitutes an additional low grade tonnage
that is mined as part of the ongoing operation. Mineral Resource is estimated in situ and thus does not include this dilution.
Ore Reserve modifying factors
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
%
Heap leach stockpiles
1,100
0.51
–
97.0
96.0
93.0
66.3
In situ
heap leach stockwork material
1,100

0.45
35.0
97.0
96.0
93.0
66.3
Vein (open pit)
1,100
4.35
35.0
97.0
96.0
93.0
96.3
Vein (underground)
1,100
5.51
45.0
97.0
96.0
93.0
96.3
A detailed reconciliation process compares estimated versus mined ore, including comparison between predicted grades and
tonnes produced in the processing plant. These comparisons are used in determining which modifying factors to use in the
Ore Reserve calculations.
Inferred Mineral Resource in business plan
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CERRO VANGUARDIA
CONTINUED
as at 31 December 2018
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
In situ heap leach stockwork material
1.26
0.29
0.37
0.01
Total
1.26
0.29
0.37
0.01
The Inferred Mineral Resource is normally located in the deeper parts of the orebody, such as the bottom of the open pits and
deeper portions of the underground Mineral Resource. It is considered in the business plan in order to delineate the final designs of
the open pits, improving efficiency in Mineral Resource utilisation.
In the current business plan, around 5% of the open pits and 16% of the underground designs contain Inferred Mineral Resource.
The Inferred Mineral Resource is excluded for Ore Reserve reporting.
Exploration and changes to the estimation methodology and re-categorisation more than replaced the depletion.
Year-on-year changes in Ore Reserve
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BRAZIL

AngloGold Ashanti's operations in Brazil comprise AngloGold Ashanti Córrego do Sítio Mineração (AGA Mineração) in the Quadrilátero Ferrífero, Minas Gerais state and Mineração Serra Grande in Goiás state. AGA Mineração consists of several operations, namely Cuiabá, Lamego and Córrego do Sítio.

Brazil – AGA Mineração Cuiabá

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Inclusive Mineral Resource as at 31 December 2018 Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
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

Exclusive Mineral Resource as at 31 December 2018 Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
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
Ore Reserve
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
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
LEGEND
1
Serra Grande
2
AGA Mineração
Operation
1,000km
0
BRAZIL CONTINUED
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AGA MINERAÇÃO

INTRODUCTION

Property description

AGA Mineração encompasses mining operations at Cuiabá, Lamego and Córrego do Sítio. The Nova Lima Sul project is currently in care and maintenance pending a decision around its future.

Location

The AGA Mineração mining complex is located in south-eastern Brazil in the state of Minas Gerais. Operations are 30km from the capital of the state (Belo Horizonte) in the case of Cuiabá and Lamego, and about 100km in the case of Córrego do Sítio, in the municipalities of Nova Lima, Sabará and Santa Bárbara respectively.

Legal aspects and tenure

Under the current Brazilian mining code and pertinent complementary legislation, mining concessions and mining “manifests” are valid up to the depletion of the Ore Reserve and Mineral Resource, provided that all obligations and the required periodic reporting to the federal government are met.

MINERAL RESOURCE

Inclusive Mineral Resource
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
AGA Mineração				
Measured	13.94	7.51	104.75	3.37
Indicated	18.04	6.29	113.41	3.65
Inferred	31.35	6.57	205.89	6.62
Total	63.33	6.70	424.05	13.63

The inclusive Mineral Resource is made up of 34% Córrego do Sítio, 49% Cuiabá, 12% Lamego and 4% Nova Lima Sul.

Inclusive Mineral Resource by-product: sulphur
as at 31 December 2018

Category

	Tonnes million	Grade %S	Contained sulphur tonnes million	pounds million
AGA Mineração				
Measured	10.12	6.5	0.66	1,446
Indicated	9.99	5.9	0.59	1,309
Inferred	13.39	5.7	0.77	1,691
Total	33.51	6.0	2.02	4,445

Sulphur is a by-product of the Cuiabá and Lamego mining operations (68% Cuiabá and 32% from Lamego).

LEGEND

AGA Mineração

Cuiabá complex

1
Cuiabá

2
Lamego

3
Queiroz plant refinery

Córrego do Sítio complex

4
CdS I

5
CdS II

Nova Lima Sul

6
Raposos

Operation

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Exclusive Mineral Resource
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
AGA Mineração				
Measured	11.72	7.30	85.49	2.75
Indicated	10.86	4.67	50.67	1.63
Inferred	31.31	6.57	205.79	6.62
Total	53.89	6.35	341.94	10.99

The exclusive Mineral Resource is made up of 37% Córrego do Sítio, 45% Cuiabá, 13% Lamego and 5% Nova Lima Sul.

Mineral Resource below infrastructure
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
AGA Mineração				
Measured	0.15	4.69	0.70	0.02
Indicated	7.84			

6.73
52.78
1.70
Inferred
22.69
7.19
163.20
5.25
Total
30.68
7.06
216.68
6.97
The Mineral Resource below infrastructure is made up of 35% Córrego do Sítio, 48% Cuiabá, 9% Lamego and 8% from Nova
Lima Sul.
Year-on-year changes in Mineral Resource
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 depletions. 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.
AGA MINERAÇÃO CONTINUED
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Year-on-year changes in Ore Reserve
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.
ORE RESERVE
Ore Reserve
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
AGA Mineração
Proved
1.94
4.35
8.43
0.27
Probable
8.79
5.06
44.47
1.43
Total
10.73
4.93
52.89
1.70
The Ore Reserve is made up of 14% Córrego do Sítio, 76% Cuiabá and 9% Lamego.
Ore Reserve by-product: sulphur
as at 31 December 2018
Category
Tonnes
million
Grade
%S
Contained sulphur
tonnes million pounds million
AGA Mineração
Proved
1.76
4.0
0.07
156

Probable	7.00	4.3	0.30	661
Total	8.76	4.2	0.37	817

Sulphur is a by-product of the Cuiabá and Lamego mining operations (90% Cuiabá and 10% Lamego).

Ore Reserve below infrastructure
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
AGA Mineração				
Proved	0.42	4.24	1.79	0.06
Probable	6.31	5.53	34.86	1.12
Total	6.73	5.45	36.64	1.18

The Ore Reserve below infrastructure is made up of 91% Cuiabá and 9% Lamego.

AGA MINERAÇÃO – CÓRREGO DO SíTIO

INTRODUCTION

Property description

Córrego do Sítio (CdS) is wholly owned by AngloGold Ashanti Córrego do Sítio Mineração (AGACSM). The CdS gold complex has been in operation since 1989 and consists of two operations: an oxide open pit mine (ore treated by a 600ktpa heap leach operation producing about 25kozpa) and two sulphide underground mines known as CdS I and CdS II (ore treated at a 700ktpa pressure leaching sulphide plant producing about 80kozpa). The haulage distance from the main underground mine, CdS I, to the metallurgical plant is around 15km. The annual production capacity of CdS is 1.2Mt. CdS I underground uses the sub-level stoping mining method. Since 2014, the mining sequence at CdS I underground has been changing from bottom-up to top-down in order to provide earlier access to high grade stoping areas. Gold produced from the CdS operations is transported by road to the company's own refinery at the Queiroz plant, about 140km away.

Location

CdS is located in the municipality of Santa Bárbara, 100km east of the city of Belo Horizonte, the capital of Minas Gerais state.

History

Exploration across the CdS area by AngloGold Ashanti began in the 1980s. A FS for the oxide Ore Reserve, to be mined by open pit and treated in a heap-leach plant, was approved in 1987. The CdS open pit operations started in the 1990s with the first phase of production between 1990 and 1998. From 2002, development of underground exploration drifts began, and a FS for the sulphide Ore Reserve, to be mined underground and treated in a sulphide plant, was concluded in 2010. Implementation followed from 2010, and the ramp-up was concluded in 2012. In 2011, there were major renovations to the structure of São Bento metallurgical plant which were finished in 2012. In 2013, the crushing circuit was improved in order to optimise the throughput.

Legal aspects and tenure

The CdS mining operation, its facilities as well as its presently delineated Mineral Resource and Ore Reserve is hosted by four DNPM concessions; DNPM Mining Concessions titles 930.556/2000; 930.181/2008; 830.129/1982; 833.472/2003 and 830.943/1979, which belong to the local company AGACSM covering 6,017.44ha. These permits are active and in good legal standing and free of liabilities. Brazilian mining concessions remain valid up to the depletion of the Ore Reserve and Mineral Resource.

DNPM Mining Concession 830.943/1979 hosts the deepest portion of the former São Bento mine and has been granted a temporary mining suspension. New documentation, based on a revised mine plan has to be submitted to the DNPM, if and when AGA Mineração decides to resume the underground operation on this concession area.

The Rosalino open pit and its waste dump area have been environmentally permitted while the application for Pinta Bem open pit is pending approval.

Mining concessions are granted to the holders of exploration licenses that manage to prove the existence of a Mineral Resource and have been licensed by the environmental authority. AGACSM is within the Brazilian Atlantic Forest biome, which is a sensitive area controlled by environmental agencies. A new Brazilian mining code is currently under discussion. However, it is not anticipated to change the company's rights, which are already established.

Mining method

The underground mining method for CdS is sub-level stoping. Each panel consists of three levels with secondary development drives being some 300m along strike in the north-east/south-west direction and cross-cuts, 300m in a southwest direction. The stopes are 15m in height. The mining sequence is bottom-up, though all of CdS I is being converted to a top-down sequence. According to geotechnical guidance, a sill pillar of 4m in height is designed between panels, and 4m rib pillars are used every 30m along the strike. The stope drilling is executed via up and down fan drilling. The loading and hauling operations are performed by 8t front-end loaders and 30t articulated trucks, at an approximate rate of 1,500tpd.

Operational infrastructure

CdS infrastructure consists of two treatment plants, namely, the sulphides plant for the underground mines at CdS II and the heap-leach plant for the oxide ore mined by open pit mine at CdS I, as well as a tailings dam for the sulphide plant, the neutralised tailings deposit for the oxide material and numerous waste dumps for the open pit mines at CdS I.

Ancillary facilities comprise a water treatment facility, ef uent treatment facilities, equipment workshops, laboratory, warehouses, explosives and accessories magazines, fuel stations, electric substations as well as offices, medical clinic, cafeteria, dressing rooms, bathrooms, storerooms, garage, fuel stations, a centre of environmental studies, nursery and other facilities required to operate the mine.

The mine power is supplied from the state grid. Water is primarily sourced from recycling the underground mine water and supplementary water catchment wells.

Good communication infrastructure is available in the area.

Mineral processing

There are two metallurgical plants in CdS: the heap-leach plant for the oxide ore and the sulphide plant.

The sulphide process consists of crushing, grinding and gravity concentration, flotation, thickening, acidulation, pressure oxidation (POX autoclave), counter current decantation, CIL extraction, elution, neutralisation, electro-winning and tailings disposal. The plant and POX circuit have a capacity of 600ktpa.

The heap-leaching process consists of crushing, agglomeration, stacking, leaching, adsorption, elution and electro-winning.

Risks

The major risk to the operation is the lack of Ore Reserve exibility. This risk is controlled and mitigated by integrated planning with the exploration team and monitoring the execution of the plan.

Competent Persons

Responsibility
Competent Person
Professional
organisation
Membership
number
Relevant
experience
Qualification
Mineral Resource
Apolo Bhering
MAusIMM
327 966
12 years
BSc (Geology), MSc (Geological
Engineering), MBA
Ore Reserve

Roberto Lima
MAusIMM
326 307
14 years
BSc (Mining Engineering), MSc
(Mining Engineering), MBA
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AGA MINERAÇÃO – CÓRREGO DO SíTIO CONTINUED
0
1
2
3km
Licences
Mining
Mining application
Exploration
Exploration application
Mine infrastructure
Pits
Plant
Leach pad
TSF
Waste dumps
Underground access
Settlements
Towns
Villages
Roads
Main
Secondary
Insert
Total mining lease area
Map zoomed in area
Plant centroid co-ordinates
43°31'11"W, 20°0'58"S
Total mining lease area
Map showing the AGA Mineração CdS Mine infrastructure and licences with the total mining lease area insert shown in the top left-hand corner
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GEOLOGY
The CdS gold deposit is located in the eastern part of the Rio das Velhas Archean greenstone belt, in the Quadrilatero Ferrero
region, on the southern margin of the São Francisco Craton in Brazil.
Deposit type
CdS is an orogenic gold deposit hosted in intensely deformed clastic, volcanoclastic, carbonaceous schists and metagraywackes in
an approximately 30km northeast/south-west striking shear zone.
Hydrothermal alteration phases associated with the mineralisation are dominated by sericite and carbonate.
Mineralisation style
CdS is located in the eastern part of the lower to middle greenschist facies, Archean, Rio das Velhas greenstone belt. The CdS I,
II and III gold deposits and associated targets are located in a gold trend that extends for about 14km in a north-easterly direction,
from Grota Funda (CdS I) in the south to Jambeiro (CdS III) in the north and which developed in a compressional tectonic regime.
Gold is associated with quartz and fine grained acicular arsenopyrite. The main gold targets and deposits are distributed over three
trends, namely the CdS Trend, the Donana Trend and the Cristina Trend. At CdS I, the main ore-bodies are Rosalino, Cachorro Bravo,
Laranjeiras and Carvoaria, which constitute the current production sources and most of the Mineral Resource.
At CdS II, the main orebodies are São Bento, Pinta Bem (both BIF hosted) and Sangue de Boi (metapellite hosted). At CdS III where
exploration has been limited, the Anomalia I orebodies are the best understood and have the highest potential.
Mineralisation characteristics
The CdS deposits consist of narrow north-east/south-west elongated and folded lenses of mineralisation, parallel to main regional
deformational structure (S2), dipping 60° to 70° to the south-east and plunging 20° to 30° to the north-east. The orebodies are
consistently folded, boudinaged and locally disrupted by younger structures. CdS is an orogenic type deposit and comprises many
hydrothermal lodes with quartz veins and low grade sulphide disseminated in the wall rocks. In general, the mineralisation consists
of sericitic zones and quartz veinlets hosted in metapellite and BIF. The sedimentary sequence, and consequently the mineralised
deposits, are cross-cut by a swarm of basic dykes of uncertain age, with a general orientation north-north-east/south-south-west
dipping to south-east, with thickness varying from 20cm to 20m.
The gold occurs as native gold in smoky-quartz veins and as microscopic or sub-microscopic inclusions in arsenopyrite (the main
mineralisation style). It may also occasionally be associated with berthierite ($FeSb_2S_4$). Other typical sulphide minerals are pyrrhotite,
pyrite, stibnite, sphalerite and chalcopyrite.
SE-NW Simplified view across the AGA Mineração – Córrego do Sítio deposits, elevation in metres
Mineral Resource
Exploration target
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SECTION 5 / AMERICAS

AGA MINERAÇÃO – CÓRREGO DO SíTIO
CONTINUED

EXPLORATION

During 2018, 55,810m were drilled along the CdS trends with the exploration focused on:

- Mineral Resource conversion in support of the production plan for the open pit and underground mines (mainly CdS I) as part of the risk amelioration programme
- Assessing high grade targets
- Evaluating the potential of near-mine and broader lease targets

Drilling at CdS was executed as part of the company's operational excellence plan. The intent was to decrease risk in the production plan by removing projected exploration targets within the first ve years of the plan as well as having 240m of depth below current mining proved up to Indicated Mineral Resource. As a result of this strategy, there were large exploration programmes in 2018.

Surface drilling focused on Mine I and CdS III Mineral Resource addition and conversion, testing the down-dip continuity of Rosalino, Cachorro Bravo and Anomalia orebodies for long-term underground and surface mining. In support of the underground production plan for the next three years at CdS I, the underground drilling concentrated on Mineral Resource conversion using a 50 x 25m drilling grid for the three main orebodies: Cachorro Bravo, Laranjeiras and Carvoaria. Results confirmed the mineralisation along the structures, improving the model quality and spatial reliability. Mineral Resource addition from underground also occurred as a result of drilling secondary lenses.

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	25 x 25	–	–	–		
Indicated	25 x 40, 30 x 25, 50 x 30, 50 x 50	–	–	–		
Inferred						

40 x 100, 100 x 50,
100 x 100, 200 x 200
–
–
Grade/ore control
3 x 3, 5 x 5
–
–
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Inclusive Mineral Resource
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
CdS I (sulphide) Rosalino underground
Measured
–
–
–
–
Indicated
0.64
3.88
2.49
0.08
Inferred
3.39
3.55
12.04
0.39
Total
4.03
3.60
14.53
0.47
CdS I (sulphide) Secondary underground
Measured
–
–
–
–
Indicated
0.11
6.15
0.66
0.02
Inferred
0.75
4.84
3.64
0.12
Total
0.86
5.00
4.30

0.14
CdS I (sulphide) Cachorro Bravo underground
Measured
1.39
6.74
9.35
0.30
Indicated
0.63
5.97
3.77
0.12
Inferred
0.52
6.01
3.11
0.10
Total
2.54
6.40
16.23
0.52
CdS I (sulphide) Laranjeiras underground
Measured
1.49
5.68
8.48
0.27
Indicated
1.05
5.78
6.07
0.20
Inferred
1.00
6.88
6.91
0.22
Total
3.55
6.05
21.45
0.69
CdS I (sulphide) Carvoaria underground
Measured
0.41
8.17
3.35
0.11
Indicated
0.75

5.76
4.30
0.14
Inferred
0.73
8.92
6.50
0.21
Total
1.89
7.50
14.15
0.45
CdS II (sulphide) Sangue de Boi underground
Measured
0.05
9.72
0.52
0.02
Indicated
0.37
8.54
3.19
0.10
Inferred
1.48
6.94
10.26
0.33
Total
1.91
7.33
13.97
0.45
CdS II (sulphide) São Bento Mine underground
Measured
–
–
–
–
Indicated
0.44
8.04
3.56
0.11
Inferred
4.63
6.35
29.41
0.95
Total

5.07
6.50
32.96
1.06
CdS II (sulphide) Pinta Bem underground
Measured
–
–
–
–
Indicated
0.01
5.17
0.05
0.00
Inferred
0.13
5.08
0.68
0.02
Total
0.14
5.09
0.73
0.02
CdS II (sulphide) Secondary underground
Measured
–
–
–
–
Indicated
–
–
–
–
Inferred
0.71
7.84
5.56
0.18
Total
0.71
7.84
5.56
0.18
CdS I (transitional) Rosalino underground
Measured
0.00
2.62
0.00

0.00
Indicated
0.16
3.67
0.60
0.02
Inferred
0.10
3.42
0.34
0.01
Total
0.26
3.58
0.95
0.03
CdS I (sulphide) Rosalino open pit
Measured
–
–
–
–
Indicated
1.33
4.01
5.32
0.17
Inferred
0.13
4.30
0.56
0.02
Total
1.46
4.03
5.88
0.19
CdS I (oxide) Rosalino open pit
Measured
0.13
1.83
0.23
0.01
Indicated
0.67
2.22
1.49
0.05
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AGA MINERAÇÃO – CÓRREGO DO SíTIO CONTINUED
Inclusive Mineral Resource
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
Inferred
0.47
1.15
0.54
0.02
Total
1.26
1.79
2.26
0.07
CdS I (oxide) Secondary open pit
Measured
0.06
6.09
0.39
0.01
Indicated
0.16
6.60
1.09
0.03
Inferred
0.44
3.83
1.68
0.05
Total
0.67
4.73
3.15
0.10
CdS I (transitional) Rosalino open pit
Measured
0.06
2.15
0.13
0.00
Indicated
0.33
2.28

0.75
0.02
Inferred
0.12
1.80
0.21
0.01
Total
0.50
2.16
1.08
0.03
CdS I (transitional)
Measured
0.04
7.34
0.30
0.01
Indicated
0.23
8.23
1.88
0.06
Inferred
0.28
5.48
1.54
0.05
Total
0.55
6.76
3.72
0.12
CdS II (oxide)
Measured
–
–
–
–
Indicated
0.74
3.03
2.23
0.07
Inferred
0.73
2.60
1.91
0.06
Total
1.47

2.81
4.14
0.13
CdS II (transitional)
Measured
–
–
–
–
Indicated
0.01
5.03
0.04
0.00
Inferred
0.09
5.44
0.50
0.02
Total
0.10
5.41
0.54
0.02
AGA Mineração – Córrego do Sítio
Total
26.97
5.40
145.61
4.68
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Estimation

Orebodies are domained into lenses based on geological criteria. These are then estimated using kriging. Kriging is also used to estimate density and sulphur when enough samples are available, alternatively a calculated mean density will be used. Mineral Resource classification uses conditional simulation or drill hole spacing.

Exclusive Mineral Resource
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
AGA Mineração – Córrego do Sítio				
Measured	3.50	6.24	21.87	0.70
Indicated	6.41	4.61	29.54	0.95
Inferred	15.67	5.44	85.28	2.74
Total	25.58	5.34	136.69	4.39

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.

Mineral Resource below infrastructure
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes

Moz
AGA Mineração – Córrego do Sítio
Measured
0.05
7.31
0.35
0.01
Indicated
2.13
5.63
12.02
0.39
Inferred
11.11
5.62
62.50
2.01
Total
13.29
5.63
74.86
2.41
The Mineral Resource below infrastructure is the Mineral Resource that cannot be accessed from the primary access development,
based on the expected position of the access at the end of 2018.
Grade tonnage curves
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AGA MINERAÇÃO – CÓRREGO DO SíTIO CONTINUED

CdS is very sensitive to changes in gold price by up to 10%.

Inclusive Mineral Resource sensitivity

The Mineral Resource reduced mainly due to depletions, new information and an increase in costs for open pit mining offset in part by estimation methodology changes.

Year-on-year changes in Mineral Resource

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ORE RESERVE
Ore Reserve
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
CdS I (sulphide) Cachorro Bravo underground
Proved
0.04
4.17
0.18
0.01
Probable
0.13
3.94
0.52
0.02
Total
0.18
3.99
0.70
0.02
CdS I (sulphide) Laranjeiras underground
Proved
0.06
4.16
0.25
0.01
Probable
0.31
4.88
1.53
0.05
Total
0.37
4.76
1.77
0.06
CdS I (sulphide) Carvoaria underground
Proved
0.04
4.30
0.18
0.01
Probable
0.43

3.66
1.56
0.05
Total
0.47
3.72
1.74
0.06
CdS II (sulphide) Sangue de Boi underground
Proved
0.03
5.43
0.18
0.01
Probable
0.43
5.10
2.19
0.07
Total
0.46
5.12
2.37
0.08
CdS II (sulphide) São Bento Mine underground
Proved
–
–
–
–
Probable
0.04
3.99
0.16
0.01
Total
0.04
3.99
0.16
0.01
CdS I (oxide) Rosalino open pit
Proved
0.01
1.18
0.01
0.00
Probable
0.07
2.74
0.18
0.01

Total
0.07
2.62
0.19
0.01
CdS I (transitional) Rosalino open pit
Proved
0.00
1.48
0.00
0.00
Probable
0.00
3.63
0.01
0.00
Total
0.00
3.31
0.01
0.00
CdS II (oxide)
Proved
–
–
–
–
Probable
0.38
1.73
0.66
0.02
Total
0.38
1.73
0.66
0.02
AGA Mineração – Córrego do Sítio
Total
1.97
3.85
7.60
0.24
Estimation
The gold price, projected operational performance and costs as well as metallurgical recoveries are taken into consideration in
determining the Ore Reserve. Mining parameters such as the mining method, minimum mining width, MCF, dilution and recovery are
all applied in the process.

AGA MINERAÇÃO – CÓRREGO DO SíTIO CONTINUED

Ore Reserve modifying factors

as at 31 December 2018

	Gold price BRL/oz	Cut-off grade g/t Au	Stoping width cm	Dilution %	RMF % (based on tonnes)	RMF % (based on g/t)	MRF % (based on tonnes)	MRF % (based on g/t)	MCF %	MetRF %
CdS I (oxide) Rosalino open pit	3,565	0.61	–	–	100.0	100.0	100.0	100.0	100.0	79.0*
CdS I (sulphide) Rosalino open pit	3,565	1.28	–	–	100.0	100.0	100.0			

100.0
100.0
94.0*
CdS I (transitional) Rosalino
open pit
3,565
0.95
–
–
100.0
100.0
100.0
100.0
100.0
50.0*
CdS I (sulphide) Cachorro
Bravo underground
3,565
3.49
408.6
48.6
97.4
102.5
107.0
96.5
90.0
93.8**
CdS I (sulphide) Carvoaria
underground
3,565
3.49
221.1
52.4
97.4
102.5
107.0
96.5
90.0
93.8**
CdS I (sulphide) Laranjeiras
underground
3,565
3.49
279.5
50.2
97.4
102.5
107.0
96.5
90.0
93.8**

CdS II (oxide)
3,565
0.79
–
–
100.0
100.0
100.0
100.0
100.0
75.0*
CdS II (sulphide) Sangue de
Boi underground
3,565
4.77
275.2
43.2
97.4
102.5
107.0
96.5
90.0
93.8**
CdS II (sulphide) São Bento
Mine underground
3,565
4.77
264.4
48.7
97.4
102.5
107.0
96.5
90.0
93.8**
* Not considering dilution or mining recovery because Ore Reserve is calculated based on a regularised model
** The gold reported represents the total Ore Reserve without MetRF however, it was considered in the cut-off grade calculation
The percentage grade dilution and the MCF are already included in the Ore Reserve reported.
As the CdS underground mines have been in operation since 2011, the technical and economic modifying factors are derived from
historic data and reasonable levels of certainty exist on CdS projections.
A minimum thickness is applied for stope design Ore Reserve estimates. Other factors derived from historic data, such as the
dilution, ore loss and the MCF as well as the MetRF, are applied in the estimates.
Inferred Mineral Resource in business plan
as at 31 December 2018
Tonnes
million
Grade
g/t

Contained gold
tonnes
Moz
CdS I (sulphide) Cachorro Bravo underground
0.05
4.57
0.25
0.01
CdS I (sulphide) Laranjeiras underground
0.45
4.94
2.23
0.07
CdS I (sulphide) Carvoaria underground
0.55
5.94
3.24
0.10
CdS II (sulphide) Sangue de Boi underground
0.53
6.21
3.28
0.11
CdS II (sulphide) São Bento Mine underground
0.00
3.62
0.01
0.00
CdS I (transitional) Rosalino open pit
0.01
1.77
0.02
0.00
CdS II (oxide)
0.05
1.44
0.07
0.00
Total
1.65
5.53
9.12
0.29

The Inferred Mineral Resource is located in the mining panels in the lower areas of some sulphide deposits such as Cachorro Bravo,
Laranjeiras and Carvoaria underground mines in CdS I and the Sangue de Boi underground mine in CdS II. Rosolino also contains
some Inferred Mineral Resource in the business plans. In all cases the Inferred Mineral Resource is removed for both the financial
modelling and the reporting of the Ore Reserve. This accounts for 36% of the business plan for the first three years.

The strategy is that the production plan should not include Inferred Mineral Resource for the first three years and the ve year
production plan should not contain any projected exploration targets.

Year-on-year decrease in the Ore Reserve, driven by the inclusion of transitional and sulphide material in the CdS Rosalino open pit
as well as new drilling information resulted in exploration losses.

Year-on-year changes in Ore Reserve

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SECTION 5 / AMERICAS

AGA MINERAÇÃO – CUIABÁ CONTINUED

INTRODUCTION

Property description

An underground operation that is wholly-owned by AngloGold Ashanti.

Location

The Cuiabá Mine is located near Sabara, southeast of the city of Belo Horizonte within the mining district referred to as the Iron Quadrangle. This region is the largest producer of iron ore and gold in Brazil.

History

In 1740, Artisanal miners carried out the first mining in the area. Saint John Del Rey Mining Company Ltd acquired the mine in 1834. Exploration and development were resumed in 1977, culminating with the reopening of the mine in 1985. In 1996, the company became a wholly owned subsidiary of the Anglo American Group, and in 1999, ownership was transferred to the holding company AngloGold (now AngloGold Ashanti), where it remains to date.

Legal aspects and tenure

The Cuiabá Mineral Resource and Ore Reserve are fully hosted by a single concession granted by the DNPM, the Mine Manifest DNPM title 000.323/1973 held by AGA Mineração, covering a total area of 3,662ha. Brazilian mining concessions remain valid up to the depletion of the Ore Reserve and Mineral Resource. A new Brazilian mining code is currently under discussion. However, it is not anticipated to change the company’s rights, which are already established.

Mining method

Cuiabá Mine utilises two mining methods: cut and fill and longhole stoping. To improve the safety and productivity of the operation, the mining method was changed in 2011 from predominately cut and fill to longhole stoping (sub-level stoping and variations). In stopes with lower inclination, Cuiabá has a longhole method that reduces planned dilution to make the mining of some narrow veins economic.

Operational infrastructure

The two plants (Cuiabá gold plant and Queiroz plant) are connected by an aerial ropeway and power is supplied by a set of small hydropower plants (Rio de Peixe).

Cuiabá Mine has a shaft system (846m deep) for production and personal transport. The current nominal airflow capacity is 1,035m^3/s, of which 320m^3/s are refrigerated.

Tailings deposition is at one of the four sites located at Cuiabá, Calcinado, Rapaunha and Cocuruto.

The Rio de Peixe hydroelectric complex is a set of seven small hydropower plants that generate energy from three dams (Ingleses, Miguelo and Codorna), connecting directly to the Queiroz plant.

Mineral processing

Cuiabá and Lamego Mines feed the Cuiabá Gold (flotation) and Queiroz (roaster, carbon circuit and refinery) plants, currently at 1.7Mtpa for a metallurgical recovery of 93.5%. At Cuiabá gold plant, crushing and milling of the ore is followed by flotation and filtration in order to produce a concentrate, which is transported by aerial ropeway to Queiroz for further treatment. Approximately 25% – 30% of gold is recovered through a gravity circuit at the Cuiabá plant. The backfill plant is also located at Cuiabá. The Queiroz plant is located in Nova Lima and comprises two different circuits for refractory ore (from Cuiabá) and non-refractory ore (used for the Raposos mine production in the past) with facilities for pyrometallurgy and hydrometallurgy. The concentrate is roasted, and the calcine proceeds to a carbon circuit for further refining. The sulphide gas is captured for processing through the acid plant. Approximately 230ktpa of sulphuric acid is produced as a by-product.

Risks

No legal or environmental risks identified. Strategic studies in place are managing some possible risks such as low level of Ore Reserve and the reliance on Inferred Mineral Resource in the production plan

and rock engineering constraints at depth.
Competent Persons
Responsibility
Competent Person
Professional
organisation
Membership
number
Relevant
experience
Qualification
Mineral Resource
Reuber Cota
MAusIMM
329 257
11 years
BSc (Geology), MSc (Geological
Engineering)
Ore Reserve
Rodrigo Fideles
MAusIMM
326 102
8 years
BSc (Mining Engineering)

0
0.5
1
1.5km
Licences
Mining
Mining application
Exploration
Exploration application
Mine infrastructure
Plant
TSF
Waste dumps
Aerial ropeway
Underground access
Roads
Main
Secondary
Insert
Total mining lease area
Map zoomed in area
Plant centroid co-ordinates
43°31’11”W, 20°0’58”S
Total mining lease area
Map showing AGA Mineração – Cuiabá Mine and Lamego Mine infrastructure and licences with the total mining lease area insert shown in the top right-hand corner
0
5
10km
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AGA MINERAÇÃO – CUIABÁ CONTINUED

W-S View of the underground infrastructure and interpolated orebodies at AGA Mineração – Cuiabá, elevation in metres relative to sea level

GEOLOGY

Cuiabá Mine is located in the Iron Quadrangle, which is a geotectonic unit at the southern edge of the São Francisco Craton,
comprising Archean and Proterozoic terrains, and bordered by Neoproterozoic mobile belts. From a regional viewpoint, Cuiabá Mine
is located in the eastern extension of the Serra do Curral inverted homocline, located on the northeastern edge of the Iron Quadrangle.

The mine lithostratigraphy consists of an intermediate metamafic sequence of the Greenstone Belt type. It is regarded as belonging
to Nova Lima Group, Rio das Velhas Supergroup.

This sequence is characterised by metametabasaltic rocks at the base (MAN), followed by metasediments characterised by Algoma
Type BIF, and carbonaceous schist, graphite schist (XG). Just above the metasediments there is a sequence of metabasalts (MBA),
overlain by an alternating sequence of metapelites (X1) and metapsamitic rocks with minor volcanoclastic (XS).

The gold mineralisation occurs in sulphide orebodies associated mainly with BIF layers, and subordinately, to minor quartz veins in
the host schists.

Deposit type

Cuiabá is a gold-only Archean BIF-hosted gold deposit. The deposit consists of an intermediate metamafic sequence of the
Archean Greenstone Belt type. It is characterised by hydrothermal alteration of the rocks, with the mineralisation occurring mainly
in BIF layers, and subordinately in quartz veins or in the host schists. The host to the gold mineralisation is the volcano-sedimentary
Nova Lima Group that occurs at the base of the Rio das Velhas Supergroup. The upper sequence of the Rio das Velhas Supergroup
is the metasedimentary Maquin Group. The gold mineralisation at Cuiabá has features and characteristics that match the epigenetic
orogenic gold deposit model typical of Archean gold-lode deposits.

Mineralisation style

Cuiabá Mine has gold mineralisation associated with sulphides and quartz veins in BIF and volcanic sequences. Structural control
and fluid flow are the most important factors for gold mineralisation with a common association between large-scale shear zones
and their associated structures. Where BIF is mineralised, the ore appears strongly stratiform due to the selective sulphidation of
the iron rich layers. Steeply plunging shear zones tend to control the ore shoots, which commonly plunge parallel to intersections
between the shears and other structures.

Legend

Surface

Development

Fonte Grande Sul Orebody

Serrotinho Orebody

Canta Galo Orebody

Balancão Orebody

Galinheiro Orebody

Galinheiro FW Orebody
VQZ Orebody

Mineralisation characteristics
Apparent intersections of thrust faults with tight isoclinal folds in a ductile environment, tend to control the mineralisation structures.
The host rocks are primarily BIF and secondarily mafic volcanics (mainly basalt). Mineralisation is believed to be due to the
interaction of low salinity, carbon dioxide-rich gold-bearing fluids with the high-iron BIF, basalts and carbonaceous graphitic schists.
Sulphide mineralisation consists of pyrite and pyrrhotite with subordinate arsenopyrite and chalcopyrite. The latter tends to occur as
a late-stage fracture fill and is not associated with gold mineralisation. Wallrock alteration is typically carbonate, potassic and silicic,
showing clear zonation in the underground environment. The ore is mainly concentrated in the silicic and sulphidation zones, inside
the BIF or in potassic (and sericitic) zones near the basalts. The main orebodies at Cuiabá are as follows:

- normal limb: Fonte Grande Sul and Serrotinho
- overturned limb: Balancão, Galinheiro and Canta Galo

Secondary orebodies occur in hydrothermally altered schists at the footwall of Galinheiro (Galinheiro footwall orebody) and
hydrothermally altered schists/quartz veins near the footwall of Fonte Grande Sul and Serrotinho (Quartz vein orebody).
N-S Geological cross-section of the AGA Mineração Cuiabá orebody perpendicular down plunge (SW), elevation in metres relative to sea level
EXPLORATION
In 2018, 58,873m of drilling was completed with underground drilling comprising 56,412m of this total. Underground exploration
focused on two processes, Mineral Resource conversion and Mineral Resource addition representing 70.5% (39,807m) and 29.5%
(16,605m) of the underground drilling respectively.
For the Mineral Resource conversion, Balancão Levels 16-17, Fonte Grade Sul Levels 20-21, Galinheiro footwall Levels 8, 14-16,
18-21, Serrotinho Level 9 and Quartz vein Level 18 were the main targets for conversion. The drilling for the main orebodies has
required the development of specific exploration drives to provide access to drill the lower levels. The Mineral Resource addition
was focused on Dom Domingos Levels 17-18, Fonte Grande Sul Levels 20-21, Galinheiro Levels 19-21, Galinheiro footwall Level 9,
Serrotinho Level 9, Serrotinho extension Level 10, Quartz vein Level 11 and 18 and Viana Level 14.
Legend
Dyke
Metagraywacke (X1/X2)
Metagraywacke (X2)
Metapelite (X1)
Metavolcanic Unit (MBA)
Carbonaceous Schist (XG)
Branded Iron Formation (BIF)
Metavolcanic Unit (MAN)
Au Quartz Veins
-320
-408

x: -844
y: -1,487
x: -894
y: -1,681
x: -943
y: -1,874
x: -993
y: -2,068
x: -1,042
y: -2,262
-232
-145
-57
31
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AGA MINERAÇÃO – CUIABÁ
CONTINUED

During 2018, the deep surface exploration drilling programme was completed and drilled 2,461m. Fonte Grande Sul and Serrotinho were intercepted on Levels 28 and the Narrow veins orebodies on Level 32. The drilling prove that the orebodies have continuity down plunge as expected. Balancão returned high grades associated with intense sulphidation and an increase in thickness. Galinheiro footwall also returned economic grades associated with sulphidation but maintaining the grades and thickness from the upper levels. Exploration will test the long inclined borehole (LIB) drilling methodology, used in South Africa, to try to replace and lower costs of the deep drilling.

The exploration target is to have three year's production without Inferred Mineral Resource and ve years without projected exploration targets in the production plan and to reach this objective, drilling the lower levels is essential.

PROJECTS

In the near term, Cuiabá will increase production plan confidence by achieving production stability and building mine exibility through drilling and modeling two levels below the current production plan. Operational effectiveness will be the foundation for the strategic approach. The mine team is, as a matter of practice, reviewing the mine plan in order to meet the current cash generation needs by looking to the inclusion of new orebodies into the plan, viz. Galinheiro footwall, Quartz vein and Serrotinho extension to maximise production from the secondary orebodies, both near and within infrastructure.

Over the next ve years, Cuiabá plans to optimise the orebody capability by targeting the secondary and satellite veins in conjunction with the main orebodies.

The Lamego Mine is already integrated into Cuiabá plans as the mine looks to maximise orebody capability by balancing selectivity against bulk mining. Improvements in the orebodies knowledge is an important and necessary step to reach these goals.

In the long term, Cuiabá plans to maintain sustainable production by continuing to explore and convert the Mineral Resource below infrastructure and bring the full economic endowment to production.

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	10 x 20, 20 x 30				–	–

–
Indicated
20 x 40, 40 x 60

–
–

–
Inferred
40 x 60, 80 x 120

–
–
–
–
Grade/ore control
5 x 5

–
–

–

Inclusive Mineral Resource
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Narrow veins – Balancão				
Measured	0.81	11.35	9.23	0.30
Indicated	1.28	13.14	16.82	0.54
Inferred	0.23	8.89	2.06	0.07
Total	2.33	12.09	28.12	0.90
Narrow veins – Galinheiro				
Measured	0.54	9.38	5.03	0.16
Indicated	1.45	8.05	11.68	0.38
Inferred	0.61	6.74	4.08	0.13
Total	2.59	8.02	20.79	

0.67
Narrow veins – Canta Galo
Measured
0.46
8.43
3.87
0.12
Indicated
0.10
10.73
1.07
0.03
Inferred
0.23
10.87
2.47
0.08
Total
0.79
9.43
7.42
0.24
Main deposits – Fonte Grande Sul
Measured
1.21
9.49
11.45
0.37
Indicated
0.64
10.02
6.39
0.21
Inferred
3.07
16.39
50.29
1.62
Total
4.91
13.87
68.13
2.19
Main deposits – Serrotinho
Measured
0.76
13.37
10.16
0.33
Indicated
1.25

9.07
11.32
0.36
Inferred
0.87
9.92
8.61
0.28
Total
2.88
10.46
30.09
0.97
Secondary areas – Satellite orebodies
Measured
0.79
6.08
4.81
0.15
Indicated
0.17
6.71
1.15
0.04
Inferred
0.32
6.08
1.92
0.06
Total
1.28
6.17
7.88
0.25
Secondary areas – Galinheiro footwall
Measured
–
–
–
–
Indicated
0.50
5.90
2.98
0.10
Inferred
1.00
5.72
5.70
0.18
Total

1.50
5.78
8.68
0.28
Secondary areas – Sill pillars
Measured
1.78
10.90
19.36
0.62
Indicated
0.53
9.19
4.83
0.16
Inferred
0.79
12.54
9.95
0.32
Total
3.10
11.03
34.14
1.10
Secondary areas – Quartz vein
Measured
–
–
–
–
Indicated
0.20
8.34
1.68
0.05
Inferred
0.16
11.43
1.84
0.06
Total
0.36
9.71
3.52
0.11
AGA Mineração – Cuiabá
Total
19.73
10.58
208.77

6.71
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AGA MINERAÇÃO – CUIABÁ CONTINUED

Inclusive Mineral Resource by-product: sulphur

as at 31 December 2018

Category	Tonnes million	Grade %S	Contained sulphur tonnes million	pounds million
AGA Mineração – Cuiabá				
Measured	6.34	8.0	0.50	1,113
Indicated	6.12	6.9	0.42	933
Inferred	7.27	6.1	0.44	975
Total	19.73	7.0	1.37	3,021

Estimation

The Cuiabá dataset consists of channel samples and drill hole samples. The 3D modelling and estimation is performed with two estimation domains, namely the thick mineralisation, consisting of Fonte Grande Sul and Serrotinho, and the narrow-vein domain consisting of Balancão, Galinheiro and Canta Galo. All channel and drill hole samples are used in the creation of 3D geological models and for identifying rock types in order to incorporate lithological proportions into the grade estimates. Conditional simulation is applied to estimate the uncertainty in the block models and classify the Mineral Resource into Measured, Indicated and Inferred Mineral Resource, following a standard internal AngloGold Ashanti methodology.

Exclusive Mineral Resource

as at 31 December 2018

Category

Tonnes

million

Grade

g/t

Contained gold

tonnes
Moz
AGA Mineração – Cuiabá
Measured
4.73
10.07
47.62
1.53
Indicated
1.16
6.62
7.70
0.25
Inferred
7.27
11.96
86.92
2.79
Total
13.16
10.81
142.24
4.57
The exclusive Mineral Resource consists primarily of the Inferred Mineral Resource that is in the process of being upgraded via infill
drilling. The exclusive Mineral Resource is located below infrastructure, starting on Level 18 (Fonte Grande Sul and Serrotinho),
Level 15 (Galinheiro), between Level 10 and corresponding sub-levels to Level 14 as well as below Level 16 (Galinheiro footwall),
between Levels 15-16 as well as below Level 17 (Balancão and Canta Galo), and below Level 21 (Fonte Grande Sul deeps and
Serrotinho deeps). In addition, secondary areas consisting of old stoping panels, the Quartz vein orebody and satellite deposits, as
well as sill pillars for all orebodies are included.
Grade tonnage curve
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Mineral Resource below infrastructure
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
AGA Mineração – Cuiabá
Measured
0.01
12.07
0.07
0.00
Indicated
2.96
9.91
29.36
0.94
Inferred
5.74
13.04
74.77
2.40
Total
8.70
11.97
104.19
3.35

The Mineral Resource below infrastructure is that Mineral Resource below a depth relative to sea level of 40.25m for Balancão,
41.25m for Galinheiro, 43.25m for Canta Galo, -239.75m for Serrotinho, -239.75m for Fonte Grande Sul, 186.25m for Galinheiro
footwall, -119.75m for Sill pillars, -119.75m for Quartz vein.

The total Mineral Resource has increased mainly due to new sampling information and refining of the model to exclude internal
waste offset by deletions.

Year-on-year changes in Mineral Resource

Cuiabá is insensitive to changes in
gold price.

Inclusive Mineral Resource sensitivity

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AGA MINERAÇÃO – CUIABÁ CONTINUED
ORE RESERVE
Ore Reserve
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
Narrow veins – Balancão
Proved
0.55
5.37
2.94
0.09
Probable
2.30
5.74
13.19
0.42
Total
2.84
5.67
16.13
0.52
Narrow veins – Galinheiro
Proved
0.08
4.15
0.34
0.01
Probable
1.63
4.26
6.95
0.22
Total
1.71
4.26
7.29
0.23
Narrow veins – Canta Galo
Proved
0.24
5.68
1.36
0.04
Probable

0.12
5.37
0.64
0.02
Total
0.36
5.57
2.00
0.06
Main deposits – Fonte Grande Sul
Proved
0.22
6.35
1.40
0.05
Probable
0.57
8.80
5.05
0.16
Total
0.80
8.11
6.46
0.21
Main deposits – Serrotinho
Proved
0.01
5.62
0.06
0.00
Probable
0.88
7.01
6.19
0.20
Total
0.89
7.00
6.24
0.20
Secondary areas – Galinheiro footwall
Proved
–
–
–
–
Probable
0.25
4.23
1.06

0.03
Total
0.25
4.23
1.06
0.03
Secondary areas – Quartz vein
Proved
–
–
–
–
Probable
0.16
7.03
1.15
0.04
Total
0.16
7.03
1.15
0.04
AGA Mineração – Cuiabá
Total
7.02
5.75
40.33
1.30
Ore Reserve by-product: sulphur
as at 31 December 2018
Category
Tonnes
million
Grade
%S
Contained sulphur
tonnes million pounds million
AGA Mineração – Cuiabá
Proved
1.10
5.3
0.06
128
Probable
5.92
4.7
0.28
607
Total
7.02
4.8

0.33
735
Estimation
The gold price, projected operational performance and costs as well as metallurgical recoveries are taken into consideration in
estimating the Ore Reserve. Mining parameters such as the mining method, minimum mining width, MCF, dilution and recovery are
all applied in the process.
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Ore Reserve modifying factors
as at 31 December 2018

	Gold price BRL/oz	Cut-off grade g/t Au	Stoping width cm	Dilution %	MRF % (based on g/t)	MCF %	MetRF %
Main deposits – Fonte Grande Sul	3,565	1.82; 5.53*	220.0	15.0	84.0	94.0	94.3
Main deposits – Serrotinho	3,565	1.82; 5.53*	220.0	15.0	84.0	94.0	94.3
Narrow veins – Balancão	3,565	1.82; 5.53*	220.0	12.0	82.0	94.0	94.3
Narrow veins – Canta Galo	3,565	1.82; 5.53*	220.0	12.0	82.0	94.0	

94.3
Narrow veins – Galinheiro
3,565
1.82; 5.53*
220.0
12.0
82.0
94.0
94.3
Secondary areas –
Galinheiro footwall
3,565
1.82; 5.53*
220.0
12.0
84.0
94.0
94.3
Secondary areas – Quartz vein
3,565
1.82; 5.53*
500.0
10.0
94.0
94.0
94.3
* Cut-off grade = 1.82g/t in areas where Ore Reserve development is already done; cut-off grade = 5.53g/t in Ore Reserve not yet accessed
Two cut-off grades are calculated and applied in the Ore Reserve estimation process. The higher cut-off grade is applied to the
Mineral Resource which is still to be accessed by primary development, bearing such costs and additional projected capital
expenses (full cut-off grade). The lower cut-off grade is applied upon the Mineral Resource where primary development already
exists, which bear all the downstream costs, except for capital development (cut-off grade without development). Dilution is
considered in two stages; planned dilution, which is incorporated as a function of operational needs related to the size of the
equipment involved; operational dilution, which is a result of drilling and blasting processes, ore mucking in the stopes, and its
transfer to the loading station. Unplanned dilution is 12% for longhole mining method.
Inferred Mineral Resource in business plan
No Inferred Mineral Resource was included in the Ore Reserve.
Ore Reserve below infrastructure
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold

tonnes
Moz
AGA Mineração – Cuiabá
Proved
0.27
5.45
1.46
0.05
Probable
5.39
5.92
31.93
1.03
Total
5.66
5.90
33.39
1.07
The Ore Reserve below infrastructure is that Ore Reserve below a depth relative to sea level of 40.25m for Balancão, 41.25m for
Galinheiro, 43.25m for Canta Galo, -239.75m for Serrotinho, -239.75m for Fonte Grande Sul, 186.25m for Galinheiro footwall,
-119.75m for Sill pillars, -119.75m for Quartz vein.
Year-on-year the Ore Reserve has decreased, mainly due to mining depletions.
Year-on-year changes in Ore Reserve
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AGA MINERAÇÃO – LAMEGO

INTRODUCTION

Property description

The Lamego Mine is an underground operation, owned by AngloGold Ashanti, within the mining district referred to as the Iron Quadrangle. This region is the largest producer of iron ore and gold in Brazil.

Location

Lamego is located in the northwest of the Iron Quadrangle, close to the Cuiabá Gold Mine. The mine is located to the east of Belo Horizonte, the capital of Minas Gerais State, in the southeast of Brazil.

History

Exploration began in the area in 1985 with a drilling campaign along a 5.7km strike length of iron formation and the opening of 2.5km of development of the Arco da Velha, Queimada and Cabeça de Pedra orebodies. After the successful completion of FS, project approval was given and implementation began in 2010 with first gold poured soon afterwards.

Legal aspects and tenure

The Lamego mining operation are hosted by three geographically contiguous DNPM concessions granted to AGA Mineração:

- The DNPM Mining Concession 830.720/1981 (577.14ha in area)
- The DNPM Mining Concession 831.554/1983 (462.09ha in area)
- The DNPM Mining Concession 832.238/2003 (583.45ha in area)

Brazilian mining concessions remain valid up to the depletion of the Ore Reserve and Mineral Resource. A new Brazilian mining code is currently under discussion. However, it is not anticipated to change the company’s rights, which are already established.

Mining method

Three mining methods were considered for Lamego during the PFS, cut and fill, stope and pillar and sublevel open stoping. Based on rock engineering and productivity considerations, the mine ultimately settled on blind hole open stope method. This is supported by a detailed infill drilling programme. Cut and fill is also used when the orebodies exceed 20m spans. While this method allows for selectivity, it has constraints in terms of productivity.

Operational infrastructure

Lamego operates as a satellite mine to Cuiabá Mine. Ore is transported to surface via ramps where it is crushed, stockpiled and transported daily to Cuiabá plant, and its ore is blended with Cuiabá ore on the ROM.

Metallurgical processing is done by two plants connected via an aerial ropeway (Cuiabá gold plant and Queiroz plant) and a set of small hydropower plants (Rio de Peixe).

Electricity is provided by Rio de Peixe hydroelectric complex, which is a set of seven small hydropower plants that generate energy from three dams (Ingleses, Miguelo and Codorna), connecting directly to the Queiroz plant.

Lamego has a natural water supply system and a plant for water and sewage treatment.

Mineral processing

Cuiabá and Lamego feed the Cuiabá gold (flotation) and Queiroz (roaster, carbon circuit and refinery) plants, currently at 1.7Mtpa for a metallurgical recovery of 93.5%. At Cuiabá gold plant, crushing and milling of the ore is followed by flotation and filtration in order to produce a concentrate, which is transported by aerial ropeway to Queiroz for further treatment.

Approximately 25% to 30% of gold is recovered through a gravity circuit at the Cuiabá plant. The backfill plant is also located at Cuiabá.

The Queiroz plant is located in Nova Lima and comprises two different circuits for refractory ore (from Cuiabá) and nonrefractory ore (used for the Raposos mine production in the past) with facilities for pyrometallurgy and hydrometallurgy. The concentrate is roasted and the calcine proceeds to a carbon circuit for further refining. The sulphide gas is captured for processing through the acid plant. Approximately 230ktpa of sulphuric acid is produced as a by-product.

Risks

There are no material risks. As a low grade operation, the accurate prediction of grade and the management of its variability is critical to ensure a successful operation.

Some possible risks such as low level of Ore Reserve and the reliance on Inferred Mineral Resource in the production plan as well as rock engineering constraints at depth are managed by strategic studies which are currently underway.

Total mining lease area
Map showing AGA Mineração – Cuiabá Mine, Lamego Mine and Nova Lima Sul project infrastructure and licences with the total mining lease area insert shown in the top left-hand corner
Licences
Mining
Mining application
Exploration
Exploration application
Mine infrastructure
Plant
TSF
Raw water
Waste dumps
Underground access
Aerial ropeway
Hydropower
Roads
Main
Secondary
Insert
Total mining lease area
Map zoomed in area
0
2.5
5
7.5km
Cuiabá plant centroid co-ordinates
43°43’55”W, 19°51’40”S
Morro da Glória Mine
Total mining lease area
0
5
10km

AGA MINERAÇÃO – LAMEGO CONTINUED

S-N View of the underground infrastructure and interpolated orebodies at AGA Mineração – Lamego, elevation in metres relative to sea level

Cabeça de Pedra
900 Elev
800 Elev
500 Elev
Carruagem
Arco da Velha
Queimada

Geology

Lamego Mine is located in the Iron Quadrangle, which is a geotectonic unit at the southern edge of the São Francisco Craton, comprising Archean and Proterozoic terrains, and bordered by Neoproterozoic mobile belts. From a regional viewpoint, Lamego Mine is located in the eastern extension of the Serra do Curral inverted homocline, located on the northeastern edge of the Iron Quadrangle.

The mine lithostratigraphy consists of an intermediate metamafic sequence of the Greenstone Belt type. It is regarded as belonging to Nova Lima Group, Rio das Velhas Supergroup.

This sequence is characterised by inferior metametabasaltic rocks at the base (MAN), followed by metasediments characterised by Algoma Type BIF, the quartz layer (MCH known as metachert), carbonaceous schist, graphite schist (XG) and a further sequence of sediments consisting of an alternating sequence of metapelites (X1) and metapsamitic rocks with a volcanoclastic contribution (XS).

Deposit type

Lamego is a gold-only Archean Greenstone BIF-hosted gold deposit. The deposit consists of an intermediate metamafic sequence of the Archean Greenstone Belt type. The host to the gold mineralisation is the volcano-sedimentary Nova Lima Group that occurs at the base of the Rio das Velhas Supergroup. The upper sequence of the Rio das Velhas Supergroup is the metasedimentary Maquin Group. The gold mineralisation at Lamego has features and characteristics that match the epigenetic orogenic gold deposit model presented for Archean gold-lode deposits.

Mineralisation style

The gold mineralisation at Lamego is characterised by orebodies associated with two horizons of chemical sedimentary rocks: BIF and MCH, also with shear zones containing abundant quartz veinlets. The proportions of these lithotypes vary substantially from one deposit to another. In the BIF, sulphide mineralisation is associated with gold, while in the MCH and quartz veins, the gold occurs either as native gold or in sulphides. Lamego shows similar rock assemblage, but with higher structural complexity than Cuiabá.

The BIF, which contains the mineralisation, is more structurally deformed and contain more silica when compared to Cuiabá, which reacted less with the hydrothermal fluid.

Competent Persons

Responsibility

Competent Person
Professional
organisation
Membership
number
Relevant
experience
Qualification
Mineral Resource
Reuber Cota
MAusIMM
329 257
11 years
BSc (Geology), MSc (Geological
Engineering)
Ore Reserve
Rodrigo Fideles
MAusIMM
326 102
8 years
BSc (Mining Engineering)
S
N
Legend
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Mineralisation characteristics

The mineralisation is characterized by sulphidation in the form of disseminated sulphide bands or as fracture filling and, more rarely,
as massive sulphide hosted in BIF/MCH. Sulphide bands are rare in MCH. The MCH (or quartz vein) is concentrated in the hinges of
the Lamego structure and has free gold as the main mineralisation with a lesser amounts associated with sulphides. The plunge of
the mineralised zones coincides with both the fold axis of the first two structural events and the mineral stretching.

NW-SE Geological cross section of the Cabeça de Pedra orebody perpendicular down plunge, in metres

Sediments
Graphite schists
BIF
Volcanics
Quartz
Legend

AGA MINERAÇÃO – LAMEGO CONTINUED

EXPLORATION

In 2018, 11,342m of underground drilling was completed, with Carruagem SW and Cabeça de Pedra being tested. Carruagem SW was drilled on Level 5 and Cabeça de Pedra on Level 6. Mineral Resource conversion drilling achieved 7,308m and an additional 4,034m added.

At Carruagem SW, exploration drilling targeted Mineral Resource addition and has confirmed expectations in terms of grades and continuity. The normal limb showed economic and continuous grades while the inverted limb is more irregular with lower grades.

The orebody is scheduled to be mined together with Carruagen SW.

Cabeça de Pedra follows the same behavior of the Carruagen SW orebody with normal limb better in terms of Mineral Resource than the inverted limb. Cabeça de Pedra was drilled in 2018 and drilling will continue in 2019, when a decision regarding its potential will be made.

Exploration is in progress to identify new opportunities close to the current mine infrastructure. The Mineral Resource that was left behind in the open pit is also being evaluated. The region will be evaluated in all areas between the existing orebodies which are not covered by drilling. Production will commence on the upper levels due to good results at Queimada, while drilling will recommence on Levels 5 and 6.

PROJECTS

Lamego when compared with Cuiabá, in the near term, has better production plan confidence associated with good production stability and mine exibility.

Lamego Mine is already integrated into Cuiabá plans as the mine looks to maximise orebody capability by balancing selectivity against bulk mining. Improvements in the orebodies knowledge is an important and necessary step to reach the goals.

In the long term, Lamego plans is to maintain sustainable production by continuing to explore and convert the Mineral Resource below infrastructure and bring the full economic endowment to production. The strategy is that the production plan should not include Inferred Mineral Resource for the first three years and the ve year production plan should not contain any projected exploration targets. Development of drilling platforms is essential and necessary but will be a challenge.

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 10	–				

–
–
Indicated
60 x 40
–
–
–
–
Inferred
120 x 60
–
–
–
–
Grade/ore control
2.7 x 3, 3 x 3
–
–
–
–

AGA MINERAÇÃO – LAMEGO CONTINUED

Estimation

The geological model is used to sub-divide the sampling information into domains for estimation. The estimation method applied at
Lamego is ordinary kriging and classification of the Mineral Resource is based on conditional simulation.

Inclusive Mineral Resource
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Main deposits – Arco da Velha				
Measured	0.70	3.23	2.27	0.07
Indicated	0.58	2.51	1.45	0.05
Inferred	0.95	2.17	2.07	0.07
Total	2.23	2.59	5.79	0.19
Main deposits – Cabeça de Pedra				
Measured	0.45	3.48	1.55	0.05
Indicated	0.91	2.85	2.59	0.08
Inferred	1.60	2.86	4.58	

0.15
Total
2.96
2.95
8.72
0.28
Main deposits – Carruagem
Measured
2.54
4.90
12.43
0.40
Indicated
2.00
4.43
8.86
0.28
Inferred
2.09
3.07
6.40
0.21
Total
6.63
4.18
27.70
0.89
Secondary areas – Queimada
Measured
0.09
6.01
0.56
0.02
Indicated
0.39
5.96
2.30
0.07
Inferred
0.57
5.85
3.31
0.11
Total
1.04
5.91
6.16
0.20
Secondary areas – Arco NE
Measured
–

–
–
–
Indicated
–
–
–
–
Inferred
0.92
2.96
2.72
0.09
Total
0.92
2.96
2.72
0.09
AGA Mineração – Lamego
Total
13.78
3.71
51.09
1.64
Inclusive Mineral Resource by-product: sulphur
as at 31 December 2018
Category
Tonnes
million
Grade
%S
Contained sulphur
tonnes million pounds million
AGA Mineração – Lamego
Measured
3.78
4.0
0.15
333
Indicated
3.87
4.4
0.17
375
Inferred
6.13
5.3
0.32
716
Total
13.78

4.7
0.65
1,424
Grade tonnage curve
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Exclusive Mineral Resource
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
AGA Mineração – Lamego				
Measured	3.30	4.46	14.72	0.47
Indicated	2.87	3.70	10.63	0.34
Inferred	6.13	3.11	19.08	0.61
Total	12.30	3.61	44.43	1.43

The exclusive Mineral Resource is made up of ore not included in the Ore Reserve, due to economic considerations plus the ore contained in the sill pillars and stope pillars. Those pillars have been designed in the Ore Reserve estimation process according to geomechanical parameters.

Mineral Resource below infrastructure
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
AGA Mineração – Lamego				
Measured	0.10	2.94	0.28	

0.01
Indicated
2.34
3.69
8.61
0.28
Inferred
3.59
3.18
11.43
0.37
Total
6.02
3.37
20.32
0.65
The Mineral Resource below infrastructure is that Mineral Resource below Level 8 for Carruagem, Level 4 for Arco da Velha, Level 3
Cabeça de Pedra and Level 3 Queimada.
.
The total Mineral Resource has increased mainly due to the update of cut-off with the new exchange rate and costs offset by
depletion and methodology changes.
Year-on-year changes in Mineral Resource
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AGA MINERAÇÃO – LAMEGO CONTINUED

ORE RESERVE

Ore Reserve

as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Main deposits – Arco da Velha				
Proved	0.28	2.11	0.59	0.02
Probable	0.11	2.06	0.24	0.01
Total	0.39	2.10	0.82	0.03
Main deposits – Cabeça de Pedra				
Proved	0.01	2.52	0.04	0.00
Probable	0.06	2.52	0.16	0.01
Total	0.08	2.52	0.20	0.01
Main deposits – Carruagem				
Proved	0.36	2.50	0.90	0.03
Probable				

0.47
3.19
1.49
0.05
Total
0.83
2.89
2.39
0.08
Secondary areas – Queimada
Proved
0.00
4.66
0.02
0.00
Probable
0.43
3.55
1.54
0.05
Total
0.44
3.55
1.56
0.05
AGA Mineração – Lamego
Total
1.74
2.86
4.97
0.16
Ore Reserve by-product: sulphur
as at 31 December 2018
Category
Tonnes
million
Grade
%S
Contained sulphur
tonnes million pounds million
AGA Mineração – Lamego
Proved
0.66
1.9
0.01
28
Probable
1.08
2.3
0.02
54

Total
1.74
2.1
0.04
82
Estimation
The gold price, projected operational performance and costs as well as metallurgical recoveries are taken into consideration in
determining the Ore Reserve. Mining parameters such as the mining method, minimum mining width, MCF, dilution and recovery are
all applied in the process.
Lamego is insensitive to changes in gold price.
Inclusive Mineral Resource sensitivity
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Ore Reserve modifying factors
*
Cut-o grade = 1.01g/t in areas where Ore Reserve development is already done; cut-off grade = 2.80g/t in Ore Reserve not yet accessed
Two cut-off grades are calculated and applied in the Ore Reserve estimation process. The higher cut-off grade is applied to the Mineral Resource which are still to be accessed by primary development, bearing such costs and additional projected capital expenses (full cut-off grade). The lower cut-off grade is applied upon the Mineral Resource where primary development already exists, which bear all the downstream costs, except for capital development (cut-off grade without development).
Dilution is considered in two stages; planned dilution, inherent to the mining area, which is incorporated as a function of operational needs related to the size of the equipment involved; operational dilution, which is a result of drilling and blasting processes, ore mucking in the stopes, and its transfer to the loading station. Unplanned dillution is 12% for longhole mining method.
Inferred Mineral Resource in business plan
No Inferred Mineral Resource was included in the Ore Reserve.
Ore Reserve below infrastructureThe Ore Reserve below infrastructure is that Ore Reserve below Level 8 for Carruagem, Level 4 for Arco da Velha, Level 3 Cabeça de Pedra and Level 3 Queimada.
The Ore Reserve reduced mainly due to mining depletion offset by exploration success coming from the Carruagem and Queimada orebodies and costs.
Year-on-year changes in Ore Reserve
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AGA MINERAÇÃO – NOVA LIMA SUL

INTRODUCTION

Property description

The Nova Lima Sul project contains the underground mine of Raposos which is currently on care and maintenance pending a decision around its future. No Ore Reserve is reported for Nova Lima Sul.

Location

The Nova Lima Sul project is located in the western portion of the Rio das Velhas greenstone belt and all the exploration targets are within a 16km radius of the Queiroz metallurgical plant. The project area consists of an area of 7,000km^2, close to the cities of Nova Lima, Raposos and Rio Acima.

History

The first formal mining company to start operations in the area was São João Del Rey Mining Company Ltd in 1834. It was acquired by Mineração Morro Velho in the early 1900s.

The Raposos mine reported 1.08Moz production from 1929 to 1999, after which it was put in care and maintenance.

Legal aspects and tenure

Nova Lima Sul is an exploration project wholly owned by AngloGold Ashanti and is made up of a number of DNPM Mining Concession including:

- Mining Concession No. 308-II 02/03/1936, DNPM 322/1973, covering an area of 2,826.33ha
- Mining Concession No. 308-VI 02/03/1936, DNPM 326/1973, covering an area of 7,465.22ha
- Mining Concession No. 308 V 02/03/1936, DNPM 325/1973, covering an area of 1,014.53ha

All three mining concessions are in good standing and as they do not host active producing operations at the moment they have formally been put on temporary mining suspension status according to the requirements of the current Brazilian mining code. Should AngloGold Ashanti decide to resume underground operations at these concessions, new mining plans will need to be submitted to the DNPM. In 2017, the Mineral Resource of Morro da Glória was written-off due to urban growth and environmental restrictions that resulted from the creation of a preservation area, called Serra do Gandarela National Park and which prevents the issuing of mining permits and environmental licences.

Mining method

Raposos mine operated with a cut and fill method.

Operational infrastructure

Raposos mine has significant amount of underground development, a shaft and a cableway to take the ore to Queiroz plant. Morro da Glória has some underground drifts developed.

Mineral processing

Raposos mine circuit was a standard direct 1,000tpd gold-leaching circuit suitable for non-refractory material.

Risks

The project has been on care and maintenance for a number of years.

Competent Persons

Responsibility
Competent Person
Professional
organisation
Membership
number
Relevant
experience
Qualification
Mineral Resource

Alessandro Silva
FAusIMM
224 831
16 years
MSc (Mineral Resource Evaluation),
Postgraduate Certificate in
Geostatistics, BA (Geology)

Map showing AGA Mineração – Nova Lima Sul project infrastructure and licences

Refer to the map showing AGA Mineração Cuiabá Mine, Lamego Mine and Nova Lima Sul project infrastructure and licences on
page 203.

GEOLOGY

Deposit type

Raposos mine is situated in the south-western portion of the Iron Quadrangle in the state of Minas Gerais in Brazil. The area is
located in the volcano-sedimentary sequence of the Nova Lima Group (Rio das Velhas Supergroup) within the Rio das Velhas
greenstone belt.

The Raposos sequence is interpreted as a ductile thrust that occurred during the first deformation event in the structural history and

with the main mineralisation also being associated with this event. The stratigraphic sequence, which is repeated by folding, has
ultramafics at the base, overlain by komatiitic basalts and andesites with layers of BIF, pelites and metavolcanoclastics at the top of
the sequence. The BIF is oxide facies (magnetite and quartz) and occurs with carbonatisation in mineralised areas.
The macro structure at Raposos is an anticline and the mineralisation is associated with these folds and shear zones and it is
surrounded by concentric hydrothermal alteration zones consisting of sericitisation, carbonisation and chloritisation. The gold is
associated with sulphides and quartz veins in the BIF as well as with altered schists.

Mineralisation style

The mineralisation in the Rio das Velhas greenstone belt is structurally controlled and associated with hydrothermal alteration along
regional D2 thrust shear zones. The mineralisation is epigenetic and at Nova Lima Sul is either of massive, banded or disseminated
sulphides hosted in BIF and lapa seca (albitised hydrothermal rocks).

Mineralisation characteristics

Mapped deposit dimensions vary in thickness from around 0.5m to 20m and can be more than 5,000m in length (down plunge).
The plunge is defined by the stretching lineation and it is parallel to the fold axis of the first two regional deformation events. The
mineralisation is primarily located in the BIF and surrounded by concentric hydrothermal alteration zones consisting of sericitisation,
carbonatisation and chloritisation.

EXPLORATION

No exploration was completed in the Nova Lima Sul region in 2018. Nova Lima Sul exploration targets comprise the Raposos
underground mine, the Mina Grande, Morro da Glória, Bicalho, Faria, Bela Fama mines, as well as the old prospects (Luzia da Mota,
Limoeiro) and several old surface workings (Saboeiro Rasgo, Urubu and Mina Grande).

PROJECTS

The Nova Lima Sul project where the Raposos mine is located, was stopped in 2010.

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	30 x 30		–	–		
Indicated	60 x 60					

–
–
–

Inferred
100 x 100

–
–
–

Grade/ore control
3 x 3

–
–
–

Inclusive Mineral Resource
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
Raposos
Measured
0.18
7.01
1.29
0.04
Indicated
0.41
6.85
2.80
0.09
Inferred
2.25
6.44
14.50
0.47
AGA Mineração – Nova Lima Sul
Total
2.84
6.53
18.59
0.60

Estimation

Raposos mine was estimated by the geostatistical UC technique.

AGA MINERAÇÃO – NOVA LIMA SUL CONTINUED

Exclusive Mineral Resource

The Nova Lima Sul project currently does not have any Ore Reserve and therefore all Mineral Resource is exclusive Mineral Resource.

Mineral Resource below infrastructure

as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
AGA Mineração – Nova Lima Sul				
Measured	–	–	–	–
Indicated	0.41	6.85	2.80	0.09
Inferred	2.25	6.44	14.50	0.47
Total	2.66	6.50	17.30	0.56

The Mineral Resource below infrastructure is the Mineral Resource below Level 36 of Raposos Mine.

Inclusive Mineral Resource sensitivity

Grade tonnage curve

Nova Lima Sul is not sensitive to changes in gold price.

There was no charge in the Nova Lima Sul Mineral Resource during 2018.

Year-on-year changes in Mineral Resource

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INTRODUCTION

Property description

Mineração Serra Grande (MSG or Serra Grande) is 100% owned by AngloGold Ashanti and is located in the north-western area of the Goiás State, central Brazil. It operates three underground and two open pit mines.

Location

Serra Grande is located 5km south of the town of Crixás, 420km from the Brazilian capital, Brasília and about 350km from the state capital of Goiás, Goiânia. Employing 1,120 persons in this largely rural area means that the mine represents the principal economic activity in the region.

History

Exploration works began in 1973 with a phase of detailed mapping and DD, which continued until 1976. The mining operation started up in 1986 in Mina III and the metallurgical plant start-up was in 1989. Serra Grande production peaked at 210kozpa supported by high grades. In 2009, the metallurgical plant was expanded to 1.3Mtpa to compensate for a declining grade-profile and in 2012, AngloGold Ashanti acquired the 50% stake that belonged to the Kinross Group.

Legal aspects and tenure

The Serra Grande has interest or agreements over 61,500ha in the Crixás Greenstone belt through a series of DNPM mining leases and exploration permits. The mining concessions include:

- 002.286/1935, covering an area of 4,206.88ha
- 960.658/1987, covering an area of 1,946.89ha
- 860.746/2005, covering an area of 88.28ha
- 862.103/1994, covering an area of 125.41ha
- 804.366/1975, covering an area of 196.05ha

Brazilian mining concessions remain valid up to the depletion of the Ore Reserve and Mineral Resource. A new Brazilian mining code is currently under discussion. However, it is not anticipated to change the company's rights, which are already established.

Mining method

The Serra Grande operation comprises three underground mines, namely Mina III (including Orebody IV, V and Ing), Mina Nova (including Pequizão Orebody) and Mina Palmeiras. The open pits mine the outcrop of the Mina III Inferior and Structure IV zones and Pequizão. Three mining methods are used underground: sub-level stoping (bottom-up and top-down), cut and fill, and room and pillar.

Operational infrastructure

Serra Grande power supply comes from the government's local state concessionaire. It operates a single tailings dam, which will support the LOM production with government environmental licensing already available. The water used in metallurgical processing comes from underground mines.

The state road GO-337 passes close to the operation providing access for logistics.

Mineral processing

The metallurgical plant has the capacity of 1.4Mtpa, combining CIL and gravimetric circuits. The ore is blended to feed the crushing circuit with a capacity of 3,800tpd. There are two mills in operation, and 20 leaching tanks with capacity of 4,800m^3 divided between pre-liming and cyanidation stages.

About 58% free gold is captured in the parallel gravity circuit. The rest of the gold is recovered by the CIL process to form the bullion that is sent to Nova Lima refining process.

Risks

There is no material risk in the Mineral Resource and Ore Reserve statement at Serra Grande.

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

Competent Persons

Responsibility	Competent Person	Professional organisation	Membership number	Relevant experience	Qualification
Mineral Resource	Marcelo Campos	MAusIMM	328 667	13 years	BA (Geology), MSc (Geotechnical engineering)
Ore Reserve	Rodrigo Fideles	MAusIMM	326 102	8 years	BSc (Mining Engineering)

SERRA GRANDE

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Map showing Serra Grande Mine infrastructure and licences with the total mining lease area insert shown in the top right-hand corner
Licences
Mining
Exploration
Exploration application
Mine infrastructure
Pits
Plant
TSF
Underground access
Settlements
Towns
Villages
Roads
Main
Secondary
Insert
Total mining lease area
Map zoomed in area
0
0.5
1
1.5km
Total mining lease area
Plant centroid co-ordinates
49°58’04”W, 14°34’25”S
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SERRA GRANDE CONTINUED

GEOLOGY

The Serra Grande gold deposits are hosted in a typical greenstone belt sequence. Two main deformational events have been identified in the region. The first one is a thrusting event (D1 from west to east) developed with irregular thrust ramp geometry. This event was responsible for stacking and inverting the stratigraphic sequences. The second event (D2) was the thrusting of the Santa Terezinha sequence over the Crixás greenstone belt, folding the rocks (F2) and generating the structural controls of the gold mineralisation, generally parallel to the fold axis.

Deposit type

The gold deposit is an orogenic mesothermal deposit, associated with the development of shear zones. The host rocks belong to the Upper Archean Crixás Group. Gold mineralisation is associated with metasediments and metavolcanics rocks from the Ribeirão das Antas and Rio Vermelho formations respectively. The Crixás Greenstone Belt is surrounded by granitic gneiss terrains from the Ribeirão das Antas and Caiamar complexes and metasedimentary rocks from the Santa Terezinha Group, which is part of the Goiás magmatic arc.

Mineralisation style

The mine is located in the Crixás Greenstone Belt sequence, in the central portion of Brazil, and the main host rocks are the metasedimentary sequences with association to metavolcanic basic rocks. The mineralisation at MSG is associated with quartz veins and massive to disseminated sulphides in metasedimentary, metavolcanoclastic and metabasalt rocks, with differing degrees of hydrothermal alteration developed over orogenical stacked thrust layers (duplexes).

Two main deformation events are responsible by mineralisation style. The first one is the principal thrust event (east over west, called D1) and develops an irregular thrust ramp geometry which stacked and inverted the stratigraphic sequence. The second event (D2) was the Santa Terezinha sequence (Magmatic Arc) thrusting over Crixás Greenstone Belt, folding the rocks (F2) and generating the structures that control the gold mineralisation, generally parallel to the fold axis.

N-S Vertical section of the Structure III orebodies showing targets, Measured, Indicated and Inferred Mineral Resource, Ore Reserve and development

Development

Ore Reserve

Mineral Resource

Indicated

Inferred

Mined

Targets

500m

Legend

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Mineralisation characteristics
Geometry of the mineralised deposits is typically complex with pinch and swell, folded and boudinage shapes, dipping between
10° to 25° and with greatest continuity along north-west-plunging structures (azimuth 290°).
The mineralisation has been split into four main domains called structures. (Structure II, III, IV and Palmeiras), and occur as stacked
lenses, generally concentrated in the same high deformation positions (with folds and disruptions) in the structures.
In Structure III, the mineralisation is located in quartz veins that are hosted in carbonaceous schists, representing the highest
gold grades (>8g/t, with free gold), as seen in Mina III (Inferior zone) and Inga. This structure is also associated with massive and
disseminated sulphides (mainly pyrrhotite and arsenopyrite) that occur in a sequence of hydrothermally-altered schists, commonly
named superior zones. Other mineralisation is arsenopyrite associated with quartz as veinlets in carbonaceous metapelite.
In Structure IV, the mineralisation comprises quartz veinlets and disseminated sulphide (pyrrhotite) hosted in graphite schists at
Pequizão. The mineralised zones are hosted in sericite and chlorite schists with massive and disseminated sulphide concentrated in
folded zones. The ore shoots plunge to the north-west and the dips vary between 6° and 35°.
The Palmeiras structure is associated with hydrothermal alteration of metabasalts, with sericite, chlorite, carbonate and massive
sulphides (pyrrhotite).
EXPLORATION
The underlying strategy has been to add new high-grade Mineral Resource, such as Mine III quartz vein below the 1,050m level,
Limoeiro and Caja, and Mina Nova Corpo 9.
As part of the overall strategy, 101,561m of DD for Mineral Resource addition purposes was completed in 2018, over the main
exploration targets of Inga, Mine III, Structure IV and Pequizão. An additional 38,857m of Mineral Resource conversion drilling was
done at Mina Nova, Mina III, Limoeiro and Caja.
New regional targets are being generated through geochemistry, geophysics and geological mapping. The main prospects are the
south and north vectors of the greenstone belt and the north Goiás Magmatic Arch. In 2018, drilling was focused on upgrading
the Inga Mineral Resource classification to Indicated Mineral Resource, new Mineral Resource addition in Mine III (Inferred Mineral
Resource).
Deep drilling in Mine III below level 1,050m has identified an extension of the quartz veins. Additional drilling is planned for 2019 at
Palmeiras South. This discovery confirms the depth exploration potential of the Crixás Greenstone Belt.
PROJECTS
During 2018, the exploration campaign consolidated the geological potential of the Limoeiro and Caja Orebodies.
In recent years, the plant throughput of MSG has increased such that the ltering circuit has became an operational bottleneck.
To address this operational restriction, MSG has commissioned the Activated Carbon Project which replaced the ltering circuit with
a CIL. This has increased the production rate from 1,300ktpa to 1,500ktpa.
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
10 x 10, 10 x 20

Indicated
25 x 25, 40 x 20, 50 x 20

–
Inferred
50 x 100, 100 x 50

–
–
–
–
Grade/ore control
2 x 2, 10 x 10
–

–
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SECTION 5 / AMERICAS

SERRA GRANDE CONTINUED

Inclusive Mineral Resource

as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Mina Nova				
Measured	2.29	3.40	7.79	0.25
Indicated	1.16	3.22	3.74	0.12
Inferred	2.05	3.42	7.00	0.23
Total	5.50	3.37	18.53	0.60
Mangaba				
Measured	–	–	–	–
Indicated	–	–	–	–
Inferred	1.00	4.88	4.86	0.16
Total	1.00	4.88		

4.86
0.16
Mina III
Measured
1.65
5.72
9.42
0.30
Indicated
1.75
4.82
8.45
0.27
Inferred
3.57
4.10
14.63
0.47
Total
6.97
4.66
32.50
1.04
Palmeiras
Measured
0.13
7.16
0.94
0.03
Indicated
0.32
5.64
1.78
0.06
Inferred
0.94
4.49
4.23
0.14
Total
1.39
5.00
6.95
0.22
Palmeiras Sul
Measured
–
–
–
–
Indicated

0.06
6.62
0.42
0.01
Inferred
0.12
6.78
0.78
0.03
Total
0.18
6.72
1.20
0.04
Pequizão
Measured
1.82
4.16
7.59
0.24
Indicated
1.10
4.06
4.45
0.14
Inferred
2.85
3.79
10.79
0.35
Total
5.77
3.96
22.83
0.73
Cajueiro
Measured
–
–
–
–
Indicated
–
–
–
–
Inferred
1.22
3.01
3.66
0.12

Total
1.22
3.01
3.66
0.12
Inga
Measured
0.30
6.23
1.86
0.06
Indicated
0.91
6.82
6.24
0.20
Inferred
2.11
6.63
13.98
0.45
Total
3.32
6.65
22.08
0.71
Open pit
Measured
0.84
3.49
2.93
0.09
Indicated
0.86
2.94
2.53
0.08
Inferred
0.39
3.12
1.23
0.04
Total
2.09
3.19
6.69
0.22
Serra Grande
Total
27.43
4.35

119.31
3.84
Estimation
The grades estimation is performed by ordinary kriging using diamond, RC and channel samples from MSG database. All search
distance are based on variographic studies for each orebody/structure. Classification is done through a combination of conditional
simulation and sample spacing studies.

Exclusive Mineral Resource
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Serra Grande				
Measured	4.00	4.16	16.62	0.53
Indicated	3.02	4.50	13.58	0.44
Inferred	12.83	4.34	55.68	1.79
Total	19.84	4.33	85.88	2.76

The exclusive Mineral Resource can be divided into three categories as well as the Cajueiro deposit, which is located 10km from the Serra Grande site:

- Inferred Mineral Resource within the operating mines, partially upgraded through infill drilling based on the production plan
- that portion of the Mineral Resource that is not currently economically feasible at the Ore Reserve price
- that portion of the Mineral Resource that requires economic studies

Grade tonnage curves

SERRA GRANDE CONTINUED

Changes mainly due to depletions offset by exploration additions from Limoeiro and Caja and some model changes on Inga and Mine III.

The Mineral Resource at Serra Grande is sensitive to changes in gold price. The change in Mineral Resource ounces between the US$1,200/oz and US$1,400/oz is within -2%, and between US$1,400/oz and US$1,600/oz is within 4%.

Year-on-year changes in Mineral Resource

Mineral Resource below infrastructure

as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Serra Grande				
Measured	0.20	6.85	1.39	0.04
Indicated	1.12	6.62	7.45	0.24
Inferred	10.88	4.48	48.78	1.57
Total	12.21	4.72	57.62	1.85

80% of Inferred Mineral Resource is below infrastructure. In addition, some Indicated Mineral Resource and Measured Mineral Resource from Inga, Palmeiras, Pequizão and Mine III orebodies are also below infrastructure.

Inclusive Mineral Resource sensitivity

ORE RESERVE
Ore Reserve
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
Mina Nova
Proved
0.24
2.45
0.59
0.02
Probable
0.41
2.18
0.88
0.03
Total
0.65
2.28
1.48
0.05
Mina III
Proved
0.28
3.87
1.08
0.03
Probable
0.35
3.99
1.40
0.04
Total
0.63
3.94
2.47
0.08
Palmeiras
Proved
0.03
3.66
0.09
0.00
Probable
0.20

3.01
0.59
0.02
Total
0.22
3.08
0.68
0.02
Pequizão
Proved
0.30
2.33
0.69
0.02
Probable
0.28
3.51
1.00
0.03
Total
0.58
2.91
1.69
0.05
Inga
Proved
0.22
3.63
0.80
0.03
Probable
0.62
4.22
2.61
0.08
Total
0.84
4.07
3.41
0.11
Open pit
Proved
0.52
2.58
1.33
0.04
Probable
0.40
2.52
1.00
0.03

Total
0.91
2.56
2.33
0.08
Serra Grande
Total
3.83
3.15
12.06
0.39
Estimation
Serra Grande Ore Reserve is estimated using the Mineral Resource and the application of modifying factors based on historic
performance. The gold price, projected operational performance and costs, as well as metallurgical recoveries, are taken into
consideration in determining the Ore Reserve. Mining parameters such as the mining method, minimum mining width, MCF, dilution
and recovery are all applied in the process.
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SERRA GRANDE CONTINUED
Ore Reserve modifying factors
as at 31 December 2018
Gold
price
BRL/oz
Cut-off
grade
g/t Au
Stoping
width
cm
Dilution
%
Dilution
g/t
MRF
% (based
on tonnes)
MCF
%
MetRF
%
Mina Nova
3,565
1.87
180.0
15.0
0.03
86.0
95.0
92.1
Mina III
3,565
1.87
180.0
15.0
0.03
86.0
95.0
95.4
Palmeiras
3,565
1.87
180.0
15.0
0.03
86.0
95.0
94.0
Pequizão

3,565
1.87
180.0
15.0
0.03
86.0
95.0
93.7
Inga
3,565
1.87
180.0
15.0
0.03
86.0
95.0
95.7
Open pit
3,565
0.94
–
10.0
0.03
90.0
95.0
98.8
Total stockpiles
3,565
0.60
–
–
–
–
–
60.0
Plant recovery depends upon a fixed tailing grade of 0.18g/t
The main modifying factors can be divided into economic and operational.
Economic modifying factors are the gold price, exchange rate (BRL/US$) and the cost matrix of the operation that is based on the
previous year's production performance. These are then used to define the cut-off grades that are listed in the economic evaluation
of each mineable block.
Operational factors are based on historical data and usually defined by performance in the previous year. Among the most important
factors are minimum mining width, operational dilution, MRF, MCF and MetRF. Operational factors are used to design Ore Reserve
solids or applied directly in the solid evaluation to estimate the Ore Reserve of each stope.
MRF and operational dilution used in the determining of the Ore Reserve are mining-method specific.
Inferred Mineral Resource in business plan
No Inferred Mineral Resource was included in the Ore Reserve.
Ore Reserve below infrastructure

as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Serra Grande				
Proved	0.38	3.68	1.40	0.05
Probable	1.21	4.03	4.87	0.16
Total	1.59	3.94	6.28	0.20

The Ore Reserve below infrastructure is the Ore Reserve below the main decline and interlevel by the end of the year.
There is a year-on-year increase in the Ore Reserve. The main changes were due depletions offset by exchange ratio (lower gold price and higher cost) and model changes.

Year-on-year changes in Ore Reserve

COLOMBIA

AngloGold Ashanti is currently responsible for the management of the Gramalote JV (AngloGold Ashanti, 51% and B2Gold, 49%).

The wholly-owned La Colosa project is currently under force majeure until the necessary environmental permits are issued.

Nuevo Chaquiro is a significant new copper-gold porphyry-style mineralised system that is located within the Quebradona Project, which is a JV between AngloGold Ashanti 94.876% and B2Gold 5.124%. B2Gold is not participating in the exploration expenditure and its interest in the project is being diluted. The Quebradona Project is situated in the Middle Cáuca region of Colombia, in the Department of Antioquia, 60km south-west of Medellin. Nuevo Chaquiro, is one of five known porphyry centres on the property and has been the focus of exploration activities since the beginning of 2012.

Colombia – Gramalote

Gold
Inclusive Mineral Resource
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
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

Exclusive Mineral Resource
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
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
LEGEND
1
Gramalote (51%)
2
Quebradona (94.876%)
3
La Colosa
COLOMBIA CONTINUED
Project
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Ore Reserve
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Colombia				
Proved	–	–	–	–
Probable	167.76	0.74	123.79	3.98
Total	167.76	0.74	123.79	3.98

Copper

Inclusive Mineral Resource
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
Exclusive Mineral Resource
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
Ore Reserve
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
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GRAMALOTE

INTRODUCTION

Property description

Gramalote is a JV between AngloGold Ashanti (51%) and B2 Gold (49%), with AngloGold Ashanti being the manager, through the operating company Gramalote Colombia Limitada (GCL). The project Mineral Resource comprises ounces from three orebodies, namely Gramalote Central, Monjas and Trinidad.

Location

The Gramalote property is located near the town of Providencia and San Jose del Nus within the municipality of San Roque, north-west of the Department of Antioquia. It is approximately 230km north-west of the Colombian capital of Bogota and 124km north-east of Medellin which is the regional capital of the Antioquia Department.

History

The region encompassing Gramalote has a long history of artisanal gold mining. Gramalote itself has had small scale artisanal mining for several decades prior to exploration work and the discovery by AngloGold Ashanti. Development of the Gramalote project commenced with a scoping study in 2009. A number of studies followed, leading to submission of a PFS in late 2013 which did not meet investment hurdles. From 2014 to 2017 intensive work was undertaken by all technical disciplines to identify ways to improve the project economics. The main changes were an improved orebody model, grade streaming to increase the feed grade in the early years and early treatment of the oxide ore that overlies the main sulphide Mineral Resource. An enhanced PFS report was completed in September 2017 with the recommendation to progress to the FS.

Legal aspects and tenure

Gramalote comprises one integrated contract concession namely 14,292, comprising 8,720.71 ha, which expires on 3 April 2043, and one preferential right (4,894) of 2,292.81ha.

In 2016, the project received its environmental and construction permits to operate for the LOM.

For exploration License 4894, the mining authority has authorised a concession agreement through Resolution 2016060072784 dated 11 August 2016.

According to Colombian mining law the exploration phase begins as soon as the concession contract is registered in the National Mining Registry. The total period for the concession contract (exploration, installation and construction, and exploitation) is 30 years, which may be renewed for an additional 20-year period. Under Colombian mining law, producing mines are subject to a federal royalty of 4% of the gross value of gold and silver production.

Mining method

Gramalote is a semi-massive, surface low-grade gold deposit including three main deposits. The PFS concluded that the project is suitable to be operated as a conventional open pit, employing 520t class shovels and 228t trucks, with a strip ratio of 2.51 and an average mining rate of 47Mtpa (max 60Mtpa). The LOM is estimated at 14 years (plus one year of pre-stripping).

Operational infrastructure

Currently the project has only field infrastructure that supports exploration and PFS studies. Key infrastructure planned includes: TSF, waste rock facility, site water management, including a major creek diversion, roads and bridges, central workshop, offices and camp, as well as a metallurgical plant.

Mineral processing

The project studies continue but the following metallurgical plan was the result of the PFS:

- Processing will be by two parallel grinding lines, one treating 11.3Mtpa of sulphide ore and the other 4.1Mtpa of Oxide ore, switching to sulphide once the oxide is exhausted
- Gold recovery process: semi-autogenous milling circuit/flotation/leaching of concentrate in two separate circuit for sulphide and oxide treatment
-

Conventional tailings deposition with a sand dam

Risks

The low grade Inferred Mineral Resource is a low confidence, high risk part of the Mineral Resource due to the broad drill spacing. As a risk mitigation action, grade control test blocks were drilled to confirm short scale continuity, mineralisation geometry and geological contacts.

Poor digitising practices of the 11 original licences that make up the main mining licence concession (14,292), have created slithers of open ground that cross the Gramalote deposit. These have been claimed by a third party (Zonte Metals). While AngloGold Ashanti believe that Zonte does not have a valid claim, Zonte is proceeding with legal action against the Secretaria de Minas (Secretary of Mines) for the Department of Antioquia, Colombia, for not titling an exploration application for the open ground.

A number of Ore Reserve risks have been recognised, all of which have detailed risk mitigation strategies around them, including the management of the 405 artisanal miners who have been identified within the project footprint and the programmes for successful physical and economic resettlement of the social units identified.

Competent Persons

Responsibility
Competent Person
Professional
organisation
Membership
number
Relevant
experience
Qualification
Mineral Resource
Claudio Devaux
MAusIMM
315 689
32 years
BSc Hons (Geology)
Ore Reserve
Marcelo Roldan
MAusIMM
324 958
22 years
BSc Hons (Mining Engineering)
GEOLOGY
The Gramalote property is located in the northern portion of Colombia's Central Cordillera. The terrain is completely underlain by
medium to coarse-grained biotite ±hornblende tonalite and granodiorite of the Cretaceous Antioquia Batholith.
Subsequent drilling within an extensive mineral tenement block of some 11,000ha (exclusively retained under licence by the JV)
identified three distinct mineral deposits (Gramalote Central, Trinidad, and Monjas West) of similar mineralisation and alteration, with
vertical to sub-vertical mineral zones extending from tens of metres to over 200m, with variable lengths up to 1km, and extending to
depths of several hundreds of metres.
Deposit type
Gramalote is a pluton-related, mesothermal gold deposit genetically related to the host intrusion. The alteration and mineralisation is
structurally controlled, restricted to small halos along veins, sheeted veins and stockworks arrays with sulphide content being less
than 5%. Observations indicate that the host rock is directly related to fluids evolved from the cooling pluton resulting in pegmatites,
aplites and K-feldspar alteration.
Mineralisation style
1
0
1
2km
Licences
Mining licence
Exploration licence
Planned mine infrastructure
Pits
Plant

Tailing
Waste rock facility
Settlements
Villages
Roads
Main
Secondary
Insert
Total mining lease area
Map zoomed in area
Planned plant centroid co-ordinates
75°00’00”W, 06°30’00”N
0
0.75
1.5km
Total mining lease area
Map showing Gramalote project planned infrastructure and licenses with the total mining lease area insert shown in the top right-hand corner

GRAMALOTE CONTINUED

The Gramalote deposit is an intrusive hosted, structurally controlled, quartz stockwork system. Mineralisation is controlled by northeast to southwest trending strike-slip shear zones and north-northwest to south-southeast trending extensional shear zones and dilational fractures. Gold mineralisation is associated with stockwork veining and in particular quartz with fine-pyrite veins, quartz-carbonate veins, and quartz with coarse pyrite veins.

Alteration occurs as both broad zones and narrow selvedges around veins. Vein selvedges range from a few millimetres up to 10cm. The intensity of the alteration is directly related to both the frequency of veins and veinlets, and their size. The wider the vein, the wider the alteration selvedge, ranging from a few millimetres around isolated veinlets to tens of centimetres around thick veins.

In zones of stockwork or where several veins are close enough to merge their selvages, the alteration halo is wider. The potassic alteration event is associated with Type I and Type II veins and it is characterised by a selvedge of K-feldspar with disseminated pyrite.

The white-mica event is characterised by a less pervasive distribution than the potassic event and it is restricted to selvages of few centimetres wide around the type III veins (Quartz-calcite white mica pyrite chalcopyrite). It is not associated with wide veins, and it does not carry high grades of gold.

Mineralisation is closely linked to alteration and, like alteration, is structurally controlled. The mineralisation is vein hosted, either in sheeted veins or in local stockworks. Three stages are identified and associated with vein and alteration types:

- Quartz-calcite-pyrite is an assemblage of fine grained quartz and calcite with very fine grained pyrite. This vein type generally does not host gold.
- Quartz-pyrite-chalcopyrite-gold is the most important gold host typically associated with K-feldspar (potassic) selvedges (the gold occurs in fractures in pyrite along with chalcopyrite).
- Quartz-calcite-white mica is commonly barren but can show moderate gold grades (up to 20g/t) and the veins are typically identified by association with the selvedges of white mica.

Mineralisation characteristics

NW-SE Geological cross-section through Gramalote Central pit, elevation in metres relative to average mean sea level

Saprolite
Tonalite
quartz-diorite
Vein
Diorite Dyke
Acid Dyke
Pit outline
High grade ore zone
Medium grade ore zone
Legend

EXPLORATION

Exploration by AngloGold Ashanti between 2003 and 2007 comprised both regional exploration programmes as well as DD in the main Gramalote Central area. Surface mapping, rock and soil sampling identified an exploration target extending over an area of more than 1km^2 centered around Gramalote Ridge. Mineralisation is contained within numerous tens-of-metre sized, structurally-related corridors which commonly contain mineralisation exceeding 1g/t gold.

In 2008, the focus of B2Gold's exploration programme was the DD campaign in the main Gramalote Central area. Additional regional exploration programmes involving infill soil geochemistry, surface trenching, mapping and sampling, were carried out on several targets adjacent to Gramalote Ridge.

In the second half of 2010, a technical study including exploration work commenced at the Gramalote project with exploration, infill drilling, metallurgical drilling and preliminary engineering investigations. Highlights from the 2011 and 2012 technical study and exploration work to date on the Gramalote property include positive metallurgical test results with recoveries in excess of 90% as well as encouraging drill results from Gramalote Central and the outside targets which indicated the potential for a larger Mineral Resource. A total of 104,129m of DD have been completed in 529 holes since AngloGold Ashanti became operator in October 2010.

Exploration drilling has been carried out on six drill targets located within 4km of the current Gramalote Central Mineral Resource including Monjas West, Trinidad, Topacio, Monjas East, La Maria and El Limon with the aim to add new Inferred Mineral Resource.

All of these targets have similar geological, alteration and mineralisation characteristics to Gramalote Central. A total of 45,118m in 132 drill holes have been completed on the six satellite targets since October 2010.

Positive gold intersections have been returned in Monjas West and Trinidad, located 2km west southwest along strike and 3km north-northwest of Gramalote Central Mineral Resource and are therefore viewed as additional economic deposits.

At La Maria, located approximately 2.5km to the east of Gramalote Central, a Mineral Resource of about 260k ounces gold was drilled but as it is part of the co-existence model, it is not included in the Gramalote Project Mineral Resource estimation. The co-existence programme aims to define a small underground Mineral Resource option for artisanal miners who must be relocated outside the Gramalote project area of influence before mining commences.

A total of 3,489m of drilling in 211 drill holes have been completed in the saprolite (oxide ore) profile at Gramalote Central during 2015 and 2016. The objective of this drilling programme was to improve the definition of the low grade saprolite Mineral Resource.

As a result, the grade of the saprolite ore has been confirmed and the risk associated with the low core recovery was reduced.

During 2012 and 2013, 15 drill holes totalling 3,954m for metallurgical testing and 13 geotechnical drill holes (5,125m) were drilled around the three deposits that make up the Gramalote project.

A total of 11,380m of sterilisation drilling was carried out from 2012 to 2017 with the intention of confirming the absence of potential mineralisation in areas where key infrastructure is located. Key locations sterilised are the tailings dam, waste dumps as well as La Maria and San Antonio plant site locations. No significant mineralisation was identified in these areas.

Gold mineralisation is associated with three overprinting texture destructive alteration assemblages including potassic, quartz-sericite and sericite carbonate. Within these alteration zones, anomalous gold mineralisation is associated with three specific types of stockwork quartz veining. These include quartz veinlets with fine-grained pyrite, quartz carbonate veinlets and quartz veinlets with granular pyrite.

The saprolite (oxide) and saprock (transition) portions of the deposit constitute a small percentage of the mineralisation. Saprolite thickness is variable from 5m to 30m with an average thickness of 15m.

Petrographic work indicates the gold occurs as ve to 20 micron sized particles associated with fractures and inclusions within pyrite and cavities associated with sulphosalts (aikinite $PbCuBiS_3$, matildite $AgBiS_2$) and tellurides (hessite (Ag_2Te). The silver to gold ratio is approximately 1:1.

GRAMALOTE CONTINUED

In addition to this, an extensive RC drilling campaign was conducted to validate the UC estimation technique. About 14,000m of RC drilling was done on the Gramalote hill (180 holes drilled at an average depth of ~80m). The drilling was done in three platforms of about 200 x 100m each, on a drilling pattern of 12.5 x 12.5m (spacing simulates a grade control block that might be used during the mine operation).

PROJECTS

A successful PFS was completed in 2017, which supported the reporting of a maiden Ore Reserve. A SAMREC Table 1 was compiled in 2017 and can be found on the company’s website.

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	–	–	–	–	–	–
Indicated	50 x 50		–	–	–	–
Inferred	100 x 100		–	–	–	–
Grade/ore control	13 x 13	–		–	–	–

The classification of the Mineral Resource was done by the 15% error with 90% confidence rule using conditional simulation.

Inclusive Mineral Resource as at 31 December 2018				
Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Gramalote Central (oxide)				
Measured	–	–	–	–
Indicated	3.49	0.60	2.10	0.07
Inferred	6.61	0.55	3.62	0.12
Total	10.09	0.57	5.71	0.18
Trinidad (oxide)				
Measured	–	–	–	–
Indicated	–	–	–	–
Inferred	9.17	0.55	5.01	0.16
Total	9.17	0.55	5.01	

0.16
Monjas West (oxide)
Measured
–
–
–
–
Indicated
–
–
–
–
Inferred
2.73
0.51
1.39
0.04
Total
2.73
0.51
1.39
0.04
Gramalote Central (sulphide)
Measured
–
–
–
–
Indicated
79.43
0.76
60.27
1.94
Inferred
16.17
0.58
9.31
0.30
Total
95.60
0.73
69.58
2.24
Trinidad (sulphide)
Measured
–
–
–
–
Indicated
–

–
–
–
Inferred
17.91
0.41
7.42
0.24
Total
17.91
0.41
7.42
0.24
Monjas West (sulphide)
Measured
–
–
–
–
Indicated
–
–
–
–
Inferred
11.24
0.57
6.45
0.21
Total
11.24
0.57
6.45
0.21
Gramalote
Total
146.75
0.65
95.56
3.07
Estimation
At Gramalote, results from about 145,000m of drilling (87,900m at Gramalote Central and 11,250m at the Trinidad area and
17,850m at Monjas West area) were used to support the estimation of the Mineral Resource. Mineral Resource modelling was
performed using a geological model based on alteration, vein abundance and gold grade. Assay gold grades composited to 2m
down-hole intervals and outliers are capped based on the distribution observations using probability plots by each estimation
domains. A geostatistical technique, LUC, was used to estimate block grades and quantify the effect of selective mining.

The new grade control information and deep drilling is being integrated into a revised Mineral Resource model.
Grade tonnage curve
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GRAMALOTE CONTINUED

Exclusive Mineral Resource

as at 31 December 2018	Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Gramalote	Measured	–	–	–	–
	Indicated	19.21	0.40	7.69	0.25
	Inferred	63.84	0.52	33.20	1.07
	Total	83.04	0.49	40.89	1.31

The exclusive Mineral Resource includes the Gramalote Central, Trinidad and Monjas West Inferred Mineral Resource and a portion of the Indicated Mineral Resource not included in the Gramalote Central designed pit.

Year-on-year the Mineral Resource remains unchanged.

As a low grade deposit Gramalote is very sensitive to a drop in gold price.

Year-on-year changes in Mineral Resource

Inclusive Mineral Resource sensitivity

ORE RESERVE

Ore Reserve

as at 31 December 2018

	Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Gramalote Central (oxide)	Proved	–	–	–	–
	Probable	2.96	0.68	2.00	0.06
	Total	2.96	0.68	2.00	0.06
Gramalote Central (sulphide)	Proved	–	–	–	–
	Probable	60.74	0.87	52.67	1.69
	Total	60.74	0.87	52.67	1.69
Gramalote	Total	63.71	0.86	54.67	1.76

Only Gramalote Central is considered for the Ore Reserve Statement.

Estimation

The Gramalote pit was designed based on a optimisation that included all haul roads, waste dumps and pit. The design was
scheduled and financial modelled to obtain the Ore Reserve.
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
%
Gramalote Central (oxide)
1,100
0.16
100.0
100.0
100.0
100.0
100.0
83.9
Gramalote Central (sulphide)
1,100
0.22
100.0
100.0
100.0
100.0
100.0
95.0
Dilution is built into Mineral Resource models for Gramalote.
Inferred Mineral Resource in business plan
as at 31 December 2018
Tonnes
million
Grade

g/t
Contained gold
tonnes
Moz
Gramalote Central (oxide)
3.79
0.63
2.39
0.08
Gramalote Central (sulphide)
5.58
0.62
3.47
0.11
Total
9.37
0.62
5.86
0.19
With appropriate caution, a small portion of Inferred Mineral Resource is within the business plan but not considered material. This
accounts for 10% of the business plan.
No change in the Ore Reserve year-on-year.
Year-on-year changes in Ore Reserve
235
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LA COLOSA

INTRODUCTION

Property description

The exploration project is wholly owned by AngloGold Ashanti. It is currently on hold and force majeure (second year extension) has been declared.

Location

The project is located 150km west of the Colombian capital city, Bogota, and 30km west of the major town of Ibague, which is the capital of the Tolima Department and the location of local government entities monitoring the project.

History

Mineralisation at La Colosa was discovered by AngloGold Ashanti's Colombian greenfields exploration team in 2006. Drilling commenced in 2007 and a conceptual study was completed in 2008.

Legal aspects and tenure

La Colosa exploration permits were consolidated with La Colosa now comprising of only one exploration permits namely EIG-163 comprising 9,210ha, expiry 28 February 2037, which is in the first year of exploration (integration of EIG-163, EIG-166, EIG-167, GLN-09261X, HEB-169 and GGF-151). Colombian mining law concerning duration of tenure states that the exploration phase begins as soon as the concession contract is registered in the National Mining Registry. The total period for the concession contract (exploration, installation and construction, and exploitation) is 30 years, which may be renewed for an additional 20-year period.

Mining method

The project is still under development and a number of options were being investigated before force majeure was declared.

Operational infrastructure

Currently the project has field infrastructure that supports access to the Mineral Resource with roads, accommodation, office and surface infrastructure for pre-logging and organisation of the drilling core. There is a core shed facility in the city of Ibague where geological and geometallurgical logging are performed. However, all work has stopped.

Mineral processing

The project is currently at an early stage and the flotation of the sulphide ore is being considered.

Risks

The La Colosa project is currently at an early stage and has identified a number of possible technical options all of which are capital intensive. The political risks associated with the mining industry in Colombia, specifically in the Tolima Department, must also be considered. The delineation of the Los Nevados Páramo by Resolution 1987 is considered a risk to the Mineral Resource and is currently being contested. 13.99Moz of Mineral Resource is potentially at risk. The failure to grant environmental permits for site operations hampered progress. This is the reason that force majeure was accepted by the government.

0
1
2
3km
Licences
Exploration
Planned mine infrastructure
Pit
Settlements
Villages
Roads
Main
Secondary
Pit co-ordinates
75°29'35"W, 4°27'47"N
Map showing La Colosa project planned pit and licenses
Competent Persons
Responsibility
Competent Person
Professional
organisation
Membership
number
Relevant
experience
Qualification
Mineral Resource
Pablo Noriega
MAusIMM
315 688
20 years
BSc Hons (Geology)
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SECTION 5 / AMERICAS

GEOLOGY

Deposit type

Preliminary studies on the mineralogy, fluid inclusion assemblages and geochemistry indicate that a younger hydrothermal event
overprints a previous porphyry style mineralisation event. These younger veinlets consist of quartz (colloform-crustiform texture)
together with adularia and gold with narrow alteration halos of illite, sericite and carbonates. A distinct temperature-salinity
environment marks this high grade ore zone (>2g/t gold average), which is spatially and genetically controlled by a north-trending
corridor of tension gashes, crossing the magmatic complex and extending towards the metamorphic rocks in the northern areas.

Mineralisation style

The La Colosa project is centered on a late Miocene (8.1Ma) multiphase diorite porphyry gold complex intruded into reduced
Paleozoic metasedimentary rocks. Although the porphyry system is generally copper-poor, a 0.1% to 0.2% copper anomaly
associated with molybolenum >150ppm occurs laterally and at depth. The highest grade gold mineralisation is closely associated
with a suite of early porphyry intrusions/breccias with potassic and sodic-calcic alteration, high intensity of gold-sulphide veinlets
and sulphur values generally exceeding 2.5%. The multiphase diorite porphyry gold complex can be divided into three phases (early,
intermineral and late) and is elliptical in shape with a known maximum north-south axis of at least 1,200m. The complex strikes
N10W with a dip of 75 east-north-east, the contacts are mostly structurally bound. Intermineral and late dacitic dykes extend both
north and south into the foliated schistose hornfels.

LA COLOSA CONTINUED

W-E Geological cross-section through La Colosa, elevation in metres relative to average mean sea level

Pyroclastic fall deposits

Late magmatic rocks

Intermineral magmatic rocks

Early magmatic rocks

Schistose wallrrock

Ore zone

0.5g/t au, 1.5g/t au, 2.0g/t au

Legend

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EXPLORATION

A total of 148,062m has been drilled to date. Three additional compliance drill holes (800m) and one geotechnical-hydrogeology drill hole was completed in 2017 before activities were suspending in early 2017.

Geometallurgical studies related to comminution modelling focused on obtaining hardness parameters are advancing. Additional metallurgical comminution tests have been carried out for poorly represented areas. This metallurgical data has been correlated with multi-element assay and spectral mineralogical data to obtain proxies for metallurgical parameters. 43,529m (153 holes) have been scanned using a sisuMobi system equipped with a RGB camera and a shortwave infrared camera.

PROJECTS

All project work has been stopped and the company applied for force majeure which was granted by the government on the basis that environmental permits were unduly delayed as was permission to work in the area around the La Linea tunnel.

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	–	–	–	–	–	–
Indicated	75 x 75		–	–	–	–
Inferred	100 x 100		–	–	–	–
Grade/ore control	–	–	–	–		

–
–
The average drill spacing of 100 x 100m has been reviewed for Mineral Resource classification. Conversion to Indicated Mineral
Resource has been allowed for sectors with a drill spacing of 75 x 75m.
Previous extension drilling has better defined the porphyry contacts and high-grade mineralisation along structural corridors.
Additional upside for mineralisation occurs to the north-west of the porphyry (sub) epithermal targets and at depth.
San Antonio is a separate much smaller porphyry centre, 1.2km south of La Colosa and characterised by hydrothermal and
intrusion breccias associated with intermineral diorites and a late dacite stock.
Mineralisation characteristics
Three types of porphyry-style hydrothermal alteration are associated with magmatic activity:
•
Potassic alteration (mainly secondary biotite), which occurs as pervasive replacement of ferromagnesian minerals and matrix in
the early and intermineral phase rocks
•
Sodic-calcic alteration (albite, actinolite and epidote), which is confined to cm-scale patches in the early and intermineral
stage rocks
•
Propylitic alteration (chlorite, epidote, albite and carbonates) within the late magmatic stage. Multiphase silicification occurs within
the schistose metamorphic rocks. Six major types of veinlets have been identified at the La Colosa project area. The veinlets
occur in the magmatic rocks as well as in the metamorphic rocks
•
The veinlet sequence is (from oldest to youngest): EB-type, A-type, M-type, S-type, D-type, and CC-type
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LA COLOSA CONTINUED

Inclusive Mineral Resource

as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained gold tonnes	Moz
Open pit				
Measured	–	–	–	–
Indicated	833.49	0.87	726.31	23.35
Inferred	217.89	0.71	154.86	4.98
La Colosa Total	1,051.38	0.84	881.17	28.33

Estimation

At La Colosa, some 148,062m of drilling supported the estimation of an Indicated Mineral Resource. Gold grades were estimated using ordinary kriging, which was performed into a block size of 50m x 50m x 10m using lithological domains (wireframes) in a grade-based mineralisation envelope and also for the waste surrounding the mineralisation. All available geological drill holes, surface sampling and mapping information was validated for use in the modelling process. The La Colosa Mineral Resource is reported at a cut-off grade of 0.35g/t. The mineralisation has been classified on the basis of kriging variance related to drill spacing.

Exclusive Mineral Resource

The La Colosa project currently does not have any declared Ore Reserve and the exclusive and inclusive Mineral Resource numbers are therefore identical.

There were no changes year-on-year.

Year-on-year changes in Mineral Resource

Grade tonnage curve

La Colosa is a high volume, low grade mineral occurrence. The Mineral Resource is insensitive to gold price.

Inclusive Mineral Resource sensitivity

QUEBRADONA

INTRODUCTION

Property description

Quebradona is a project having completed a conceptual study (2016) and a PFS (2019). It is a JV between AngloGold Ashanti (94.876%) and B2Gold (5.124%). Five main targets have been identified, namely Nuevo Chaquiro, Aurora, Tenedor, Isabela and La Sola. Nuevo Chaquiro is the most advanced of the targets. Nuevo Chaquiro, a significant copper-gold porphyry-style mineralised system, is one of five known porphyry centres on the property and has been the focus of exploration activities since the beginning of 2011, with more than 75km of drilling. Nuevo Chaquiro was the sole deposit considered in the PFS.

Location

The Quebradona project is situated in the Middle Cuca region of Colombia, in the Department of Antioquia, 60km south-west of Medellin.

History

Exploration was carried out from 2004 by AngloGold Ashanti and then from 2006 to 2009 by B2Gold. In 2010 AngloGold Ashanti took management control and focused its exploration efforts on Nuevo Chaquiro. In 2014, a maiden Mineral Resource was published for Nuevo Chaquiro and a conceptual study was initiated. The PFS was completed in January 2019. The FS is expected to be completed in 2020.

Legal aspects and tenure

Quebradona comprises one tenement (5881). It is the result of integration of the ve original tenements (5869, 6318, 6359, 7579 and 5881). Integrated tenement 5881 was issued on the 9 December 2016 and totals 7,593ha. Colombian mining law concerning duration of tenure states that the exploration phase begins as soon as the concession contract is registered in the National Mining Registry. The total period for the concession contract (exploration, installation and construction, and exploitation) is 30 years, which may be renewed for an additional 20-year period.

Mining method

The Quebradona project is a greenfields project. The PFS concluded that sub-level-caving is the preferred mining method. The Nuevo Chaquiro deposit is considered to be medium to large, steep dipping, competent rock mass with higher grade material located at the top of the deposit which is approximately 200m below surface. The grade profile reduces with depth, thus making exploitation of the deposit amendable to SLC being a top down mining method. Drill and blast methods will be used to fracture the orebody commencing at the top and sequentially moving downwards with an inter-level spacing of 27.5m from 425m below surface to 975m below surface.

Operational infrastructure

The project is close to existing infrastructure such as the regional highway, power and water. The planned underground infrastructure consists of an adit to access the orebody and number of internal vertical ore passes that gravity feeds to the main ore transfer level. The material will be transferred to the main internal crusher by load and haul dump vehicles. Crushed material will then be transferred horizontally to surface via a 6km conveyor, in a dedicated adit to a single coarse ore stockpile.

Mineral processing

PFS level test work confirmed that the ore can be treated by a typical porphyry copper flotation circuit producing a copper/gold concentrate. The concentrate is clean and free of deleterious elements which would attract smelter penalties. The processing circuit includes primary crushing underground, secondary crushing, high pressure grinding rolls, ball milling, rougher-scavenger flotation for all elements (Cu, Au, Ag), followed by regrinding the concentrate and cleaning, firstly in conventional cells and then in columns. A further flotation stage removes pyrite to leave a non-acid producing flotation tails and a pyrite concentrate that can be stored in a lined and eventually sealed impoundment within the TSF. Molybdenum, at present, is not planned for recovery.

The Quebradona process plant will be designed to treat approximately 6.2Mtpa underground ore to produce copper concentrate over a 23 year mine life with provision of space for a molybdenum plant in the future.

Risks

Several risks have been identified which if properly managed can be mitigated. Geological risk is considered low to moderate. About 89% of the in situ material mined within the LOM mining plan is classified as Indicated Mineral Resource including about 95% mined within the defined payback period. Variability in copper grade is low, with high continuity. Security risk is considered low. Nuevo Chaquiro has a moderate seismic risk.

Other identified risks that will need to be mitigated include preventing schedule overruns both in the FS and in implementation; increasing geotechnical information levels; completing the final metallurgical test work; tailings; cost of earthworks; storage capacity in case of rain; seismic design criteria; financial and labour costs understated.

Environmental permits are expected to be forthcoming and will be progressed during the FS phase. Community surveys have identified local opposition to the project, though the project is listed by the national government as a project of national interest. AngloGold Ashanti Colombia (AGAC) will continue to work with the community to address and mitigate concerns.

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

Competent Persons

Responsibility	Competent Person	Professional organisation	Membership number	Relevant experience	Qualification
Mineral Resource	Pablo Noriega	MAusIMM	315 688	20 years	BSc Hons (Geology)
Ore Reserve	Andrew McCauley	MAusIMM	223 692	15 years	Graduate Diploma (Mining)

Envelope 0.45% Cu
Roads
Settlements
Secondary
Helipad
Village
Orebody
Licences
Exploration
Exploration application
Planned Mine Infrastructure
Tunnel
Helipad co-ordinates
75°44’51”W, 5°45’50”N

GEOLOGY

The geology of Nuevo Chaquiro consists of a volcanoclastic sequence of Miocene age (ash, tuffs, agglomerates and andesites) intruded by small dykes of diorite and quartz diorite, also of Miocene age. The host rock is intruded by different pulses of diorite, primarily fine to medium grained quartz diorites. For the most part these rocks don’t outcrop. The intrusive rocks are categorised into the pre-mineral, early, intra-mineral and late, according to cross-cutting relationships, position and copper-gold values. The alteration develops a well zoned porphyry system type with alteration of different temperatures represented by propylitic, sericitic, chloritic, potassic and calcic-potassic assemblages. Higher grade copper gold mineralisation (>0.6% copper) is associated with a well- developed quartz vein stockwork in the cupola zone of early quartz diorite, persisting over a vertical interval of 500m.

Deposit type

Nuevo Chaquiro is a typical porphyry copper deposit with large tonnes and low grade with gold, molybdenum and silver by-products. The structural setting facilitated the intrusion through the volcanoclastic sequence of the Combia formation. The intrusives did not reach surface and remain as a blind deposit despite a significant period of erosion.

Mineralisation style

The Nuevo Chaquiro deposit consists of Miocene-aged diorite, quartz diorite dykes and thin vertical stocks intruding a thick succession of andesitic tuffs and volcanoclastic rocks of the Miocene-aged (6 to 10Ma) belonging to the Combia formation, which lls a large pull-apart basin within the prospective middle Cauca belt of central Colombia. Depth to mineralisation from the surface is around 150 to 400m from northeast to southwest. Typical copper porphyry alteration zonation is evident with a high temperature, potassium silicate central zone (biotite, magnetite, chalcopyrite, and molybdenite), which grades into an overlying sericitic alteration zone (muscovite, chlorite, quartz, pyrite,±tourmaline) surrounded by more distal propylitic alteration (chlorite, epidote, illite, carbonate). There is also an inner core of calcic-potassic alteration with biotite, actinolite, epidote, and anhydrite with lesser amounts of copper, gold and molybdenum.

Map showing Quebradona project planned tunnel, orebody (0.45% Cu) and licenses
QUEBRADONA CONTINUED
0
1
2
3km

Mineralisation characteristics

The intrusives can be categorised as pre-mineral, early, intra-mineral and late, according to cross-cutting relationships, locality and
copper-gold values. The early dyke is located in the eastern part of the deposit and is the main supplier of heat and hydrothermal
fluids that caused the mineralisation event. In the central area abundant intra-mineral diorite and quartz diorites are found,
over which a classic ore shell of lower-grade mineralisation (>0.3% copper) appears to be draped. Higher grade copper-gold
mineralisation (>1.4% copper) is associated with a well-developed quartz vein stock-work in the cupola zone of the early quartz
diorite, persisting over a vertical interval of 500m. The majority of the intrusive rocks do not outcrop.

The mineralised zone is characterised by fine stock works, disseminations and veinlets of quartz, magnetite, pyrite, chalcopyrite
and molybdenite.

Traces of bornite and cubanite have been locally observed but in amounts not exceeding 0.1% volume. Other sulphides include
pyrite and amounts of pyrrhotite in specific area. Gold and silver correlate well with copper and many but, by no means, all gold
grains occur on the margins of sulphide grains within the chalcopyrite. This was confirmed in the metallurgical test programme that
nished in 2016.

SW-NE Geological cross-section through Nuevo Chaquiro, elevation in metres relative to average mean sea level

Tuff

Intra-mineral Quartz Diorite

Early Quartz Diorite

Cu ore zone

0.6%

,

0.45%

Cu

Pre-mineral Quartz Diorite

Legend

245

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QUEBRADONA CONTINUED

EXPLORATION

Updated or new information produced in 2018 for the PFS are related to: geometallurgy, geotechnical engineering, hydrogeology, geological information in potential infrastructure sites, a preliminary assessment of grade control requirements and a revision of the estimated endowment. The geological and estimation models were not updated due to the fact that no new holes were drilled and sampled. However, an update of the structural and geological model was completed, focusing on the infrastructure location sites connecting to mine areas. Classification was reviewed during 2018, using updated conditional simulation and kriging variance criteria, which resulted in approximately 43% of the tonnes classified as Indicated Mineral Resource.

PROJECTS

A successful PFS was completed in late 2018, which supported the reporting of a maiden Ore Reserve. A SAMREC Table 1 has been compiled and can be found on the company’s website. The FS will be completed in 2020.

MINERAL RESOURCE

Quebradona will be a copper mine with gold and silver as by-products.

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	30 x 30	–	–	–	–	–
Indicated	60 x 60		–	–	–	–
Inferred	120 x 120		–	–	–	–
Grade/ore control	–					

–
–
–
–
–
Drill hole spacing over the project is variable, influenced by environmental and social considerations. Where possible multiple drill holes are conducted from the same drill pad to minimise impact on the environment. Drilling at Quebradona varies from 50 x 50m grid in the central part and 100 x 100m to 120 x 120m in the adjacent low grade Inferred Mineral Resource areas. Due to the multihole platforms the drill hole spacing in the first 300m is tighter than in the deeper portions.

Estimation

Copper, gold, silver, molybdenum, arsenic and sulphur grades are estimated using ordinary kriging into a 40 x 40 x 20m block model. Grades are estimated within grade-based 3D wireframe boundaries for copper and gold with separate domains for molybdenum and sulphur.

Drill hole data is composited to 6m down-hole lengths prior to estimation and extreme values are capped. Estimation is into homogeneous geological domains using ordinary kriging. Classification was guided by conditional simulation plus kriging variance criteria.

The Mineral Resource was tested for and found to have reasonable and realistic prospects for eventual economical extraction.

In 2018, the MSO tool was used to constrain the Mineral Resource for Quebradona. A sub level cave option was considered followed by a second phase block cave. The average of all material included in the mining shape is $40/ore tonne in-situ NSR with a NSR cut-off value of about $19/ore tonne.

ORE RESERVE

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Grade tonnage curve

Estimation

The Ore Reserve is based on the Mineral Resource Model. Design work was performed to generate the 3D underground design.

Dilution and draw modelling were applied to the in-situ Mineral Resource of the production within the $45/t NSR cut-off mineralised envelope. The dilution is applied as an algorithm rather than a modifying factor. Schedules were combined and financially modelled to obtain the Ore Reserve.

Ore Reserve modifying factors
as at
31 December 2018

	Commodity	Price	Cut-off grade		Tonnes dilution %	Grade dilution	MCF %	MetRF %
Nuevo Chaquiro	Copper	2.65 US$/lb	45*	$/t	13.30	1.14 %	95.8	100.0
	Gold	1,100 US$/oz	–	–	13.30	0.54 g/t	60.0	100.0
	Silver	16.32 US$/oz	–	–	13.30	0.66 g/t	82.3	100.0

* Ore cut-off NSR $45/t and development cut-off NSR $25/t

COPPER

Inclusive Mineral Resource

as at 31 December 2018

Category	Tonnes million	Grade %Cu	Contained copper tonnes million	Contained copper pounds million
Nuevo Chaquiro				
Measured	–	–	–	–
Indicated	242.57	0.86	2.09	4,617
Inferred	325.40	0.47	1.51	3,337
Quebradona Total	567.97	0.64	3.61	7,954

QUEBRADONA CONTINUED

Year-on-year changes in Mineral Resource

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. The attributable percentage increased from 93.505% to 94.876%.

Inclusive Mineral Resource sensitivity

A copper sensitivity analysis showed differences from -11% to +17% (pounds) for copper prices from 2.9 to 3.8 USD$/pound respectively. Given that the project is planned as a cave there will be little opportunity to react in any changes in copper price.

as at 31 December 2018

	Category	Tonnes million	Grade %Cu	Contained copper tonnes million	Contained copper pounds million
Nuevo Chaquiro	Proved	–	–	–	–
	Probable	104.05	1.21	1.26	2,769
Quebradona	Total	104.05	1.21	1.26	2,769

as at 31 December 2018

	Category	Tonnes million	Grade %Cu	Contained copper tonnes million	Contained copper pounds million
Quebradona	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
Mineral Resource below infrastructure
All of the Mineral Resource is below infrastructure.
Ore Reserve
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Inferred Mineral Resource in business plan
as at 31 December 2018
Tonnes
million
Grade
%Cu
Contained copper
tonnes million pounds million
Nuevo Chaquiro
13.87
0.01
0.16
349.39
Total
13.87
0.01
0.16
349.39

The amount of Inferred Mineral Resource in the business plan is not material and is contained in isolated blocks within the cave and can therefore not be planned separately. The financial effect of setting the Inferred Mineral Resource grades to waste had a negligible effect on the project returns.

Ore Reserve below infrastructure

All of the Ore Reserve is below infrastructure.

Year-on-year changes in Ore Reserve

The maiden Ore Reserve is based on exploration success and the completion of the PFS at Quebradona.

QUEBRADONA CONTINUED
Year-on-year changes in Mineral Resource
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. The attributable percentage increased from 93.505% to 94.876%.
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
Nuevo Chaquiro
Proved
–
–
–
–
Probable
104.05
0.66
69.12
2.22
Quebradona
Total
104.05
0.66
69.12
2.22
Inferred Mineral Resource in business plan
Gold
Inclusive Mineral Resource
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
Nuevo Chaquiro
Measured
–
–
–
–
Indicated

242.57
0.45
107.99
3.47
Inferred
325.40
0.22
70.45
2.26
Quebradona
Total
567.97
0.31
178.44
5.74
Exclusive Mineral Resource
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
Quebradona
Measured
–
–
–
–
Indicated
138.52
0.28
38.87
1.25
Inferred
325.40
0.22
70.45
2.26
Total
463.92
0.24
109.32
3.51
Mineral Resource below infrastructure
All of the Mineral Resource is below infrastructure.
Ore Reserve
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SECTION 5 / AMERICAS

BY-PRODUCTS

Inclusive Mineral Resource by-product: silver
as at 31 December 2018

Category	Tonnes million	Grade g/t	Contained silver tonnes	Moz
Quebradona				
Measured	–	–	–	–
Indicated	242.57	5.40	1,311	42.14
Inferred	325.40	3.46	1,126	36.20
Total	567.97	4.29	2,437	78.34

Inclusive Mineral Resource by-product: molybdenum
as at 31 December 2018

Category	Tonnes million	Grade ppm	Contained molybdenum kilotonnes	pounds million
Quebradona				
Measured	–	–	–	–
Indicated	242.57	145	35.28	

78
Inferred
325.40
130
42.35
93
Total
567.97
137
77.62
171
Ore Reserve by-product: silver
as at 31 December 2018
Category
Tonnes
million
Grade
g/t
Contained silver
tonnes
Moz
Quebradona
Proved
–
–
–
–
Probable
104.05
7.05
733
23.58
Total
104.05
7.05
733
23.58
The maiden Ore Reserve is based on exploration success and the completion of the PFS at Quebradona.
Year-on-year changes in Ore Reserve
as at 31 December 2018
Tonnes
million
Grade
g/t
Contained gold
tonnes
Moz
Nuevo Chaquiro
13.87
0.54
7.43

0.24
Total
13.87
0.54
7.43
0.24
The economics of the project are controlled by copper and as such the small amount of gold is not material.
Ore Reserve below infrastructure
All of the Ore Reserve is below infrastructure.
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ADMINISTRATIVE INFORMATION
This section provides information on our definition of Mineral Resource and Ore Reserve as well as a glossary of terms and abbreviations.

MINERAL RESOURCE

The SAMREC Code, 2016 edition, definition of a Mineral Resource is as follows:

"A Mineral Resource is a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling. Mineral Resources are subdivided, and must be so reported, in order of increasing confidence in respect of geoscientific evidence, into Inferred, Indicated or Measured categories."

All reports of Mineral Resource must satisfy the requirement that there are reasonable prospects for eventual economic extraction (more likely than not), regardless of the classification of the Mineral Resource. Portions of a deposit that do not have reasonable prospects for eventual economic extraction are not included in a Mineral Resource.

The Mineral Resource is estimated using all drilling and sampling information along with a detailed geological model.

The geological models are based on various combinations-of-core and/or chip logging, mapping, geophysics, geochemistry and geological understanding that have been developed for each deposit. Most of the AngloGold Ashanti deposits have been the subject of research by world experts in the relevant class of gold deposits.

The grade estimation for each deposit has been developed over the life of the mine, and is constantly reviewed in terms of grade control information and reconciliation with the metallurgical plant. In general, the deep South African mines utilise a process of Compound Log normal macro co-kriging for the estimation of the Mineral Resource while the open pits and shallow underground mines generally use recoverable Mineral Resource models, estimated using UC or LUC.

In order to comply with the economic requirement of the definition of Mineral Resource, all AngloGold Ashanti Mineral Resource are constrained at an upside gold price, with all other parameters being kept the same as used for estimation of the Ore Reserve. In the underground gold mines, scoping studies are conducted on all coherent blocks of ground that lie above the calculated Mineral Resource cut-off. These studies include all cost and capital requirements to access the block. In the case of open pit operations, pit optimisations are conducted at the Mineral Resource gold price and all material outside these shells is excluded from the Mineral Resource unless it is potentially mineable from underground.

It is the opinion of AngloGold Ashanti that the Mineral Resource represents a realistic view of an upside potential to the Ore Reserve.

In interpreting the Mineral Resource it is critical to factor in the following:

- That there is a reasonable expectation of eventual economic extraction
- The Mineral Resource is quoted in situ and has not been corrected for dilution, mining losses or recovery
- Many of the areas lying in the exclusive Mineral Resource are currently being actively drilled and are the subject of economic and technical studies. It can, however, not be assumed at this stage that the company has intent to mine these areas

Mineral Resource classification is based on the ‘15% Rule’. A Measured Mineral Resource should be expected to be within 15% of the quarterly metal estimate at least 90% of the time while, for an Indicated Mineral Resource estimate, the annual metal estimate should be within 15% of the metal estimated at least 90% of the time. For an Inferred Mineral Resource, the annual error may, for 90% of the time, be greater than 15%.

The process and methodology of classification are at the discretion of the Competent Person and involves expressing the ‘15% Rule’, as a required level of information, in tangible terms the spacing of the drill hole or tunnel spacing in a particular deposit.

Techniques such as conditional simulation or even an empirical reconciliation-based approach are employed. However, all operations are responsible for demonstrating, through reconciliation, that their classification system conforms to the 15% rule set out above.

Final Mineral Resource classification also considers relative confidence in sampling and drilling QA QC as well as other variables that may impact on confidence in tonnage and grade.

DEFINITIONS CONTINUED

The Inferred Mineral Resource category is intended to cover situations in which a mineral concentration or occurrence has been identified and limited measurements and sampling have been completed but in which the data are insufficient to allow the geological or grade continuity to be interpreted with confidence. While it would be reasonable to expect that the majority of Inferred Mineral Resource would upgrade to Indicated Mineral Resource with continued exploration, due to the uncertainty of Inferred Mineral Resource, it should not be assumed that such upgrading will always occur.

AngloGold Ashanti quotes its Mineral Resource as inclusive of the Ore Reserve. However, in this document, the exclusive Mineral Resource is also quoted. The exclusive Mineral Resource is defined as the Inclusive Mineral Resource less the Ore Reserve before dilution and other factors are applied.

The exclusive Mineral Resource consists of the following components:

- Inferred Mineral Resource, including that within the Ore Reserve design or stope shape
- Mineral Resource that sits above the Mineral Resource cut-off but below the Ore Reserve cut-off and which resides within the defined Ore Reserve volume
- Mineral Resource that lies between the LOM pit shell/mine design and the Mineral Resource pit shell/mine design (this material will become economic if the gold price increases)
- Mineral Resource where the technical studies to engineer an Ore Reserve have not yet been completed

All grade tonnage graphs represent in-situ grade and tonnes within the Mineral Resource. Caution should be exercised when interpreting the grade tonnage graphs presented. The ability to selectively mine the deposits may be precluded by the deposit geometry, mining method and the need for practical development of the orebody.

ORE RESERVE

The SAMREC Code, 2016 edition, definition of an Ore Reserve is as follows:

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

Although the term Ore Reserve is used throughout this document, it is recognised that the term Mineral Reserve is used in the SAMREC code. For the purposes of reporting under the SAMREC Code, these terms are considered to be synonymous.

Ore Reserve is subdivided in order of increasing confidence into Probable Ore Reserve and Proved Ore Reserve.

In the underground operations, the Ore Reserve is based on a full mine design and, in the case of open pits, on a pit optimisation followed by a final pit design. The Ore Reserve is reported according to tonnage, mean grade(s) and contained metal inclusive of mining dilution, mining ore-losses and mine call factors. These modifying factors are based on measurements rather than estimates.

Tonnage and grade estimates for surface stockpile materials that meet Ore Reserve criteria are itemised separately.

Only the Ore Reserve included for treatment in the business plan production schedule is considered in the Ore Reserve statement.

Inferred Mineral Resource is not included in the Ore Reserve statement. Inferred Mineral Resource may however have an influence on the Ore Reserve by virtue of its inclusion in the optimisation process used to define the final pit limits or stope design. Inclusion in the production schedule will also influence the cash flow and thus the viability of any project. The effect of including Inferred Mineral Resource in the business plan is tested by scheduling the optimisation results, including the Inferred Mineral Resource, and generating a cash flow based on giving a value to the Proved and Probable Ore Reserve component of the schedule only (Inferred Mineral Resource is cost as waste). The Ore Reserve is acceptable if the cash flow is positive over the life of the mine.

For all new projects, an audited PFS (as a minimum requirement) must have been completed that demonstrates the viability of the project and meets the company’s investment requirements. This study must be signed off at the appropriate executive level in order to demonstrate an intent on the part of the company to proceed to FS and ultimately to implement the project.

GLOSSARY OF TERMS

Banded Iron formation (BIF)
A chemically formed iron-rich sedimentary rock.

By-products
Any potentially economic or saleable products that emanate from the core process of producing gold or copper, including silver, uranium, molybdenum and sulphuric acid.

Calc-silicate
A metamorphic rock consisting mainly of calcium-bearing silicates such as diopside and wollastonite, often formed by metamorphism of impure limestone or dolomite.

Capital expenditure
Total capital expenditure on tangible assets which includes stay-in-business and project capital.

Carbon-in-leach (CIL)
Gold is leached from a slurry of ore with cyanide in agitated tanks and adsorbed on to activated carbon granules at the same time (when cyanide is introduced in the leach tank, there is already activated carbon in the tank and there is no distinction between leach and adsorption stages). The carbon granules are separated from the slurry and treated in an elution circuit to remove the gold.

Carbon-in-pulp (CIP)
Gold is leached conventionally from a slurry of ore with cyanide in agitated tanks. The leached slurry then passes into the CIP circuit where activated carbon granules are mixed with the slurry and gold is adsorbed on to the activated carbon. The gold-loaded carbon is separated from the slurry and treated in an elution circuit to remove the gold.

Comminution
The crushing and grinding of ore to make gold available for physical or chemical separation (see also Milling).

Contained gold
The total gold content (tonnes multiplied by grade) of the material being described.

Cut-off grade
The minimum grade at which a unit of ore can be mined to achieve the desired economic outcome.

Depletion
The decrease in quantity of ore in a deposit or property resulting from extraction or production.

Development
The process of accessing a deposit through shafts and/or tunnelling in underground mining operations.

Electro-winning
A process of recovering gold from solution by means of electrolytic chemical reaction into a form that can be smelted easily into gold bars.

Elution
Recovery of the gold from the activated carbon into solution before zinc precipitation or electrowinning.

Feasibility study (FS)
A comprehensive technical and economic study of the selected development option for a mineral project that includes appropriately detailed assessments of applicable modifying factors together with any other relevant operational factors and detailed financial analysis necessary to demonstrate, at the time of reporting, that extraction is reasonably justified (economically mineable). The results of the study may reasonably serve as the basis for a final decision by a proponent or financial institution to proceed with, or finance, the development of the project. The confidence level of the study will be higher than that of a PFS (SAMREC 2016).

Flotation

Concentration of gold and gold-hosting minerals into a small mass by various techniques (for example collectors, frothers, agitation and air flow) that collectively enhance the buoyancy of the target minerals, relative to unwanted gangue, for recovery into an overflowing froth phase.

Full grade ore (FGO)

Ore material with sufficient grade to carry the full operating cost. FGO cut-off is the break-even grade where cost is representative of all costs to carry the full operation.

Gold produced

Refined gold in a saleable form derived from the mining process.

Grade

The quantity of ore contained within a unit weight of mineralised material generally expressed in grams per metric tonne (g/t) or ounces per short ton of ore (oz/t) for gold-bearing material.

GLOSSARY OF TERMS CONTINUED

Indicated Mineral Resource

That part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of modifying factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation (SAMREC 2016).

Inferred Mineral Resource

That part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity. An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration (SAMREC 2016).

Leaching

Dissolution of gold from crushed or milled material, including reclaimed slime, prior to adsorption on to activated carbon or direct zinc precipitation.

Life of mine (LOM)

Number of years that the operation is planning to mine and treat ore as taken from the current mine plan.

Marginal ore

Ore material with grade below the FGO cut-off that can be economically treated at the end of mine life when overhead and mining costs are reduced. Marginal ore cut-off is the break-even grade where cost is representative of the reduced cost that will be experienced after mining has ended.

Measured Mineral Resource

That part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with confidence sufficient to allow the application of modifying factors to support detailed mine planning and final evaluation of the economic viability of the deposit. Geological evidence is derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade or quality continuity between points of observation. A Measured Mineral Resource has a higher level of confidence than that applying to either an Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a Proved Mineral Reserve or to a Probable Mineral Reserve (SAMREC 2016).

Metallurgical plant

A processing plant designed to treat ore and extract gold or copper in the case of Quebradona (and, in some cases, often valuable by-products).

Milling

A process of reducing broken ore to a size at which concentrating can be undertaken (see also comminution).

Mine call factor (MCF)

The ratio, expressed as a percentage, of the total quantity of recovered and unrecovered mineral product after processing with the amount estimated in the ore based on sampling. The ratio of contained gold delivered to the metallurgical plant divided by the estimated contained gold of ore mined based on sampling.

Metallurgical recovery factor
(MetRF)

A measure of the efficiency in extracting gold from the ore.

Mineral deposit

A mineral deposit is a concentration (or occurrence) of material of possible economic interest in or on the Earth's crust.

Mining recovery factor (MRF)

This factor reflects a mining efficiency factor relating the recovery of material during the mining process and is the variance between the tonnes called for in the mining design and what the plant receives. It is expressed in both a grade and tonnage number.

Modifying factors

Considerations used to convert Mineral Resource to Ore Reserve. These include, but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governmental factors.

Net present value (NPV)
The difference between the present value of cash inflows and the present value of cash outflows.
Ore Reserve
The term Ore Reserve is preferred under the JORC Code but Mineral Reserve is in common use in other countries and reporting codes (SAMREC) and are generally accepted and regarded as synonymous.
Ounce (oz)
Imperial measure of mass specifically used for precious metals and still the standard measure of mass in the gold industry. A kilogram is equal to 32.1507 troy ounces. A troy ounce is equal to 31.1035 grams.
Páramo
Apline tundra ecosystem/alpine moorland.
Pay limit
The grade of a unit of ore at which the revenue from the recovered mineral content of the ore is equal to the total cash cost including Ore Reserve development and stay-in-business capital. This grade is expressed as an in situ value in grams per tonne or ounces per short ton (before dilution and mineral losses).
Precipitate
The solid product formed when a change in solution chemical conditions results in conversion of some pre-dissolved ions into solid state.
Prefeasibility study (PFS)
A comprehensive study of a range of options for the technical and economic viability of a mineral project that has advanced to a stage where a preferred mining method, in the case of underground mining, or the pit configuration, in the case of an open pit, is established and an effective method of mineral processing is determined. It includes a financial analysis based on reasonable assumptions on the modifying factors and the evaluation of any other relevant factors which are sufficient for a Competent Person, acting reasonably, to determine if all or part of the Mineral Resource may be converted to a Mineral Reserve at the time of reporting. A PFS is at a lower confidence level than a FS (SAMREC 2016).
Probable Ore Reserve
The economically mineable part of an Indicated, and in some circumstances, a Measured Mineral Resource. The confidence in the modifying factors applying to a Probable Mineral Reserve is lower than that applying to a Proved Mineral Reserve (SAMREC 2016).
Proved Ore Reserve
The economically mineable part of a Measured Mineral Resource. A Proved Mineral Reserve implies a high degree of confidence in the modifying factors. (SAMREC 2016).
Reclamation
In the South African context, reclamation describes the process of reclaiming tailings dumps using high-pressure water cannons to form a slurry which is pumped back to the metallurgical plants for processing.
Recovered grade
The recovered mineral content per unit of ore treated.
Reef
A gold-bearing horizon, sometimes a conglomerate band, that may contain economic levels of gold. Reef can also be any significant or thick gold bearing quartz vein.
Refining
The final purification process of a metal or mineral to a saleable form.
Region
Defines the operational management divisions within AngloGold Ashanti, namely South Africa, Continental Africa (DRC, Ghana, Guinea, Mali and Tanzania), Australasia (Australia) and the

Americas (Argentina, Brazil and Colombia).

Rehabilitation

The process of returning disturbed land to a stable, productive or self-sustaining condition requiring no ongoing maintenance to meet the post-mining land use objectives and taking into account beneficial uses of the site and surrounding land. Rehabilitation objectives are generally defined in environmental permits but are typically amended during the operational phase of projects through stakeholder engagement processes to ensure post mining land uses are congruent with surrounding and regional land use plans. Rehabilitation methods can vary by location owing to the extent of disturbance and geo-climatic factors and include, among others, the processes of remediation, revegetation and restoration, to address issues such as soil, ground and surface water, contamination, soil erosion and revegetation.

Resource modi cation factor (RMF)

This factor is applied when there is an historic reconciliation discrepancy in the Mineral Resource model. For example, between the Mineral Resource model tonnage and the Grade Control model tonnage. It is expressed in both a grade and tonnage number.

Seismic event

A sudden inelastic deformation within a given volume of rock that radiates detectable seismic energy.

Shaft

A vertical or subvertical excavation used for accessing an underground mine for transporting personnel, equipment and supplies; for hoisting ore and waste; for ventilation and utilities; and/or as an auxiliary exit.

Smelting

A pyro-metallurgical operation in which gold precipitate from electro-winning or zinc precipitation is further separated from impurities.

Selective mining unit (SMU)

The smallest unit that can be mined at a particular operation with the equipment available at that site, reflecting the intended or proposed mining selectively.

Stay-in-business capital

Capital expenditure to maintain existing production assets, including replacement of vehicles, plant and machinery, Ore Reserve development and capital expenditure related to safety, health and the environment.

Stope

Underground excavation where ore is extracted.

Stoping

The process of excavating ore underground.

Stripping ratio

The ratio of waste tonnes to ore tonnes mined calculated as total tonnes mined less ore tonnes mined divided by ore tonnes mined.

Tailings

Finely ground rock of low residual value from which valuable minerals have been extracted.

Tailings storage facility (TSF)/
facilities (TSFs)

Dam facilities designed to store discarded tailings.

Tonne (t)

Used in metric statistics. Equal to 1,000 kilograms, the International System Units (SI) mass unit.

Tonnage

Quantity of material measured in tonnes.

Waste

Material that contains insufficient mineralisation for consideration for future treatment and, as such, is discarded.

GLOSSARY OF TERMS CONTINUED
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SECTION 6 / ADMINISTRATIVE

ABBREVIATIONS

°

Degrees

%

Percentage

$

United States dollars

3D

Three-dimensional space

2D

Two-dimensional space

AC

Aircore drilling

Ag

Silver

AGA

AngloGold Ashanti

AGACSM/AGA

Mineração

AngloGold Ashanti Córrego do Sítio Mineração

AGAG

AngloGold Ashanti (Ghana) Ltd

ARS

Argentine peso

ASX

Australian Securities Exchange

Au

Gold

AUD

Australian dollars

Avg/Ave

Average

Barrick

Barrick Gold Corporation

BIOX

Bacterial oxidation

BMD

Below mine datum

BRL

Brazilian real

ca.

Circa (approximately)

CdS

Córrego do Sítio

CLR

Carbon Leader Reef

cm

Centimetres

cm.g/t

Centimetre grams per tonne

CPR

Competent Persons reports
Cu
Copper
DD
Diamond drilling
DHEM
Down-Hole Electromagnetic (survey)
DNPM
The Brazilian National Department for Mineral
Production
DRC
Democratic Republic of the Congo
EMP
Environmental Management Plan
ESIA
Environmental and social impact assessment
FAusIMM
Fellow of the Australasian Institute of Mining and
Metallurgy
g
Grams
GCL
Gramalote Colombia Limitada
GGB
Geita Greenstone Belt
GGM
Geita Gold mine
g/t
Grams per tonne
ha
Hectare
HLEM
Horizontal Loop Electromagnetic (survey)
JORC
Australasian Code for Reporting Exploration
Results, Mineral Resources and Ore Reserves
JSE
Johannesburg Stock Exchange Ltd
JV
Joint venture
KCD
Karagba, Chauffeur and Durba
kg
Kilograms
koz
Thousand ounces
kozpa
Thousand ounces per annum
kt
Thousand tonnes
kg/t

Kilograms per tonne
km
Kilometres
km
2
Square kilometre
KMS
Kwezi Mensah Shaft
ktpa
Kilo tonnes per annum
lb
Pounds
LIB
Long inclined borehole
LUC
Localised uniform conditioning
M or m
Metre or million, depending on
the context
m
2
Square metre
m
3
Cubic metre
Ma
Mega-annum
MAusIMM
Member of the Australasian Institute of Mining
and Metallurgy
MCH
Meta-chert
Mlb
Million pounds
mm
Millimetres
Mo
Molybdenum
Moz
Million ounces
MPRDA
Mineral and Petroleum Resources Development
Act
MPRTO
Mineral and Petroleum Resources
Titles Office
mRL
Metres relative level
MSG
Mineração Serra Grande
MSO

Mineable Shape Optimiser
Mt
Million tonnes
Mtpa
Million tonnes per annum
Mtpm
Million tonnes per month
MW
Mega watt
MWS
Mine Waste Solutions
NYSE
New York Stock Exchange
oz/t
ounces per tonne
POX
Pressure oxidation
QA/QC
Quality Assurance/Quality Control
RCubed
Mineral Resource and Ore Reserve Reporting
System
R or ZAR
South African rand
Randgold
Randgold Resources Limited
RC
Reverse circulation drilling
RGB
Red-green-blue
ROM
Run-of-mine
RRSC
Mineral Resource and Ore Reserve Steering
Committee
S
Sulphur
SAG
Société Ashanti Goldfields de Guinea
SAG mills
Semi-autogeneous grinding mills
SAMREC
The South African Code for the Reporting of
Exploration Results, Mineral Resources and
Mineral Reserves
SEMOS
Société d’Exploration des Mines d’Or de
Sadiola SA
SEC
United States Securities and Exchange
Commission

SFZ
Sadiola Fracture Zone
SOKIMO
Société Minière de kilo-Moto
SOMIQ
Société Minière Internationale du Quebéc
SSP
Sadiola Sulphide project
tpd
Tonnes per day
U_3O_8
Uranium oxide
UC
Uniform conditioning
VCR
Ventersdorp Contact Reef
VMR
Village Main Reef
VR
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WUDLs
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FORWARD-LOOKING STATEMENTS

Certain statements contained in this document, other than statements of historical fact, including, without limitation, those concerning the economic outlook for the gold mining industry,expectations regarding gold prices, production, total cash costs, all-in sustaining costs, all-in costs, cost savings and other operating results, productivity improvements, growth prospects and outlook of AngloGold Ashanti's operations, individually or in the aggregate, including the achievement of project milestones, commencement and completion of commercial operations of certain of AngloGold Ashanti's exploration and production projects and the completion of acquisitions, dispositions or joint venture transactions, AngloGold Ashanti's liquidity and capital resources and capital expenditures and the outcome and consequence of any potential or pending litigation or regulatory proceedings or environmental health and safety issues, are forward-looking statements regarding AngloGold Ashanti's operations, economic performance and financial condition. These forward-looking statements or forecasts involve known and unknown risks, uncertainties and other factors that may cause AngloGold Ashanti's actual results, performance or achievements to differ materially from the anticipated results, performance or achievements expressed or implied in these forward-looking statements. Although AngloGold Ashanti believes that the expectations reflected in such forward-looking statements are reasonable, no assurance can be given that such expectations will prove to have been correct. Accordingly, results could differ materially from those set out in the forward-looking statements as a result of, among other factors, changes in economic, social and political and market conditions, the success of business and operating initiatives, changes in the regulatory environment and other government actions, including environmental approvals, fluctuations in gold prices and exchange rates, the outcome of pending or future litigation proceedings, and business and operational risk management. For a discussion of such risk factors, refer to AngloGold Ashanti's annual reports on Form 20-F led with the United States Securities and Exchange Commission. These factors are not necessarily all of the important factors that could cause AngloGold Ashanti's actual results to differ materially from those expressed in any forward-looking statements. Other unknown or unpredictable factors could also have material adverse effects on future results. Consequently, readers are cautioned not to place undue reliance on forward-looking statements. AngloGold Ashanti undertakes no obligation to update publicly or release any revisions to these forward-looking statements to reflect events or circumstances after the date hereof or to reflect the occurrence of unanticipated events, except to the extent required by applicable law. All subsequent written or oral forward-looking statements attributable to AngloGold Ashanti or any person acting on its behalf are qualified by the cautionary statements herein.

NON-GAAP FINANCIAL MEASURES

This communication may contain certain “Non-GAAP” financial measures. AngloGold Ashanti utilises certain Non-GAAP performance measures and ratios in managing its business. Non-GAAP financial measures should be viewed in addition to, and not as an alternative for, the reported operating results or cash flow from operations or any other measures of performance prepared in accordance with IFRS. In addition, the presentation of these measures may not be comparable to similarly titled measures other companies may use

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NOTES

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SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

Date: March 29, 2019
By:
/s/ M E SANZ PEREZ
Name:
Title:
EVP: Group Legal, Commercial & Governance
AngloGold Ashanti Limited
M E Sanz Perez