Exhibit 96.5

Goldfields.com

Technical Report Summary of

Mineral reserves and Mineral resources 31 December 2021

for

Gold Fields Limited – Agnew Gold Mine – Australia

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1 Executive Summary

This technical report summary was prepared for Gold Fields Limited (Gold Fields or the Company or the Registrant), a production stage issuer. The purpose of this technical report summary for the Agnew Gold Mine (Agnew) is to highlight significant information in the report focusing on property ownership, exploration strategy and results, Mineral resources and Mineral reserves and key capital and operating cost estimates. Agnew is a production stage property located in Western Australia and this technical report summary has been compiled in accordance with the Securities and Exchange Commission (SEC) property disclosure requirements for mining registrants as specified in Subpart 229.1300 of Regulation S-K - Disclosure by Registrants Engaged in Mining Operations.

The effective date of this technical report summary is 31 December 2021.

Unless otherwise specified, all units of currency are in United States dollars (US$). All measurements are metric with the exception of troy ounces (oz).

1.1 Property description and ownership

Agnew is located approximately 870 kilometres (km) by road northeast of Perth, the capital of Western Australia (Figure 1.1.1).

Figure 1.1.1: Location of Agnew in Western Australia

Source: Agnew CPR, 2021

Gold Fields has owned and operated Agnew since 2001 when Agnew Gold Mining Company Proprietary Limited (AGMC), ACN 098-385-883, was incorporated in Australia as the legal entity holding and conducting mining activity on the Agnew mineral leases. Gold Fields has 100 % ownership of 101 granted Mining Leases and 12 granted Exploration Licences covering an area of 78 613, and 21 Miscellaneous Licences covering 744 ha.

The major components of the Agnew mining and processing operation are:

- The operating Waroonga and New Holland underground mines accessed by declines.
- A 1.3 Mt per annum capacity crushing, milling and carbon-in-pulp (CIP) process plant.
- Tailings storage facilities (TSF).
- A hybrid renewable power plant.
- Administration centers.
- Engineering workshops.
- A residential camp.

1.2 Geology and mineralisation

Agnew is located in the northern portion of the north-northwest trending Archean Norseman-Wiluna Greenstone Belt, which forms part of the Yilgarn Craton of southern Western Australia.

The stratigraphic succession in the Property comprises tholeiitic basalts, high-Mg basalts, ultramafic flows and layered mafic intrusions unconformably overlain by clastic-dominated metasediments which are folded about the north-plunging Mt White syncline in the north of the Property and the north-plunging Lawlers anticline in the south of the Property.

The most substantial gold deposits and the focus of most previous exploration and mining activity at Agnew are located along the western limb of the Lawlers anticline (Waroonga, Redeemer and New Holland complexes) spatially related to the north-northwest trending Waroonga and EMU shears.

Most of the western limb gold deposits are broadly related to intersections between structures and mafic-ultramafic stratigraphy with biotite-garnet alteration assemblages dominating to the south and quartz veining to the north. The hydrothermal gold deposits occur in several different styles of lodes and are typically discontinuous with short range predictability. The New Holland complex is associated with quartz veining within sedimentary rocks between the Waroonga and EMU shears.

1.3 Exploration, development and operations

Agnew is a well-established mining operation and exploration activities are focused on discovery and resource development aimed at replacing production depletion and growth in Mineral reserves to maintain operational flexibility and sustainability. Agnew's exploration and development strategy focuses on the extension of existing orebodies and the discovery and delineation of new orebodies both at existing sites and at undeveloped sites across the property. Once a potential orebody has been discovered, exploration is extended and intensified in conjunction with comprehensive infill drilling, in order to enable clearer definition of the orebody and its technical and economic characteristics to profile the potential portions to be mined. Geological, geochemical, geophysical, geostatistical, geotechnical and geometallurgical techniques are constantly refined to improve effectiveness and the economic viability of prospecting and mining activities. A multi-year budget is established to ensure traction on exploration strategies to secure strong exploration project pipelines with the capacity to deliver new Mineral reserves and mining fronts that extend the life of mine.

The Greater Agnew Project (GAP) project, staged over the next three to four years, will provide an integrated view of the mine's full site potential and cost base aimed at extending LoM and sustaining the operation at current metal production levels beyond 2027. If the GAP is not implemented at Agnew over the scheduled project timeline, cost control and the achievement of the AIC/oz metric will be important.

Agnew comprises three underground mining areas referred to as Waroonga, New Holland and Redeemer. Waroonga and New Holland have been amalgamated into a single mine with a link drive.

Waroonga is predominantly mined using long hole sub level stoping with cemented paste fill. The underground mining is carried out under contract to Barminco, including the supply and maintenance of all underground mobile equipment. The mining methods used at New Holland are long-hole open stoping and inclined room and pillar. All underground mining there is completed by an owner-operator team.

The planned Redeemer Zone 2 and Barren Lands underground developments will be mined by long-hole open stoping with pastefill in selected areas.

Open pit mining by conventional drill and blast, and truck and shovel operations is also scheduled in the life of mine plan at Barren Lands, Maria South, Hidden Secret/Glasgow Lass and 450 South.

The recent production performance of Agnew is summarized in Section 12.2.1.

Exploration drilling completed during 2021 was focused on extending the Waroonga, New Holland and Redeemer complexes to extend the life of mine.

Infill drilling at Waroonga further defined the significant Kath Lower lode, which remains open down-plunge. Extensional and infill drilling was also completed at the Waroonga North lodes, replacing ore depleted by mining. Down-plunge extensional drilling of the Kim lode continued to return positive results. Step-out and infill drilling is planned for the Waroonga North, Kath Lower, Main South, FBH South and Kim South areas.

At New Holland, extensional and exploration drilling was conducted at Hidden Secret, Sheba South and Sheba North lodes. The drilling at Sheba South defined a significant high-grade extension of the Sheba lode. Further drilling is planned at Sheba South, Sheba North and Hidden Secret.

Drilling also continued to grow the Redeemer underground complex. At Barren Lands, resource conversion drilling down-plunge of the proposed Barren Lands open pit added to the underground Mineral reserve, which remains open down-plunge. Drilling the Redeemer North lode confirmed the geometry and thickness of the mineralisation, resulting in the reinstatement of Redeemer North as a Mineral resource. Planned exploration includes Mineral resource conversion drilling at Barren Lands, Redeemer North and Redeemer Zone 2 North, and testing of down-plunge extensions. Recent life of mine infrastructure investments to secure a sustainable future include completion of a link drive between the Waroonga and New Holland mines, completion of the solar farm, wind farm and gas electricity facility and upgrades to underground infrastructure and ventilation in existing mines.

1.4 Mineral resource estimates

The Agnew Mineral resources exclusive of Mineral reserves as at 31 December 2021 are summarized in Table 1.4.1. The Mineral resources are 100 % attributable to Gold Fields and are net of production depletion up to 31 December 2021. The point of reference for the Mineral resources is in-situ over a minimum mining width with dilution applied. Open pit Mineral resources are confined to pit shells and underground Mineral resources are constrained to a practical mining shape and a minimum mining width.

Table 1.4.1: Agnew - summary of gold Mineral resources as at 31 December 2021 (fiscal year end) based on a gold price of $1,500/oz

	Mineral resources (exclusive of Mineral reserves)			Cut-off Grades (g/t Au)	Metallurgical Recovery (%)
	Amount/ (kt)	Grades/ (g/t Au)	Amount/ (koz Au)		
Underground Mineral resources					
UG Measured Mineral resources	107	5.8	20	2.15 to 4.07	94.04
UG Indicated Mineral resources	6,114	5.3	1,043	2.15 to 4.07	94.04
UG Measured + Indicated Mineral resources	6,221	5.3	1,063	2.15 to 4.07	94.04
UG Inferred Mineral resources	6,888	4.6	1,027	2.15 to 4.07	
Open pit Mineral resources					
OP Measured Mineral resources					
OP Indicated Mineral resources	1,980	2.7	173	0.76 to 0.93	94.99
OP Measured + Indicated Mineral resources	1,980	2.7	173	0.76 to 0.93	94.99
OP Inferred Mineral resources	751	3.5	86	0.76 to 0.93	93.44
Stockpile Mineral resources					
SP Measured Mineral resources					
SP Indicated Mineral resources					
SP Measured + Indicated Mineral resources					
SP Inferred Mineral resources					
Total Agnew Mineral resources					
Total Measured Mineral resources	107	5.8	20		
Total Indicated Mineral resources	8,093	4.7	1,216		
Total Measured + Indicated Mineral resources	8,200	4.7	1,236		
Total Inferred Mineral resources	7,639	4.5	1,112		

Notes:
a) Rounding of figures may result in minor computational discrepancies.
b) Mineral resources are exclusive of Mineral reserves.
c) No year-on-year Mineral resource comparison is presented as Agnew did not disclose a Mineral resource in 2020.
d) Quoted as diluted in situ metric tonnes and grades. Metallurgical recovery factors have not been applied to the Mineral resource estimates. The approximate metallurgical recovery factor is 93.4 %. The metallurgical recovery is the ratio, expressed as a percentage, of the mass of the specific mineral product recovered from ore treated at the process plant to its total specific mineral content before treatment. Agnew mining operations vary according to the mix of the source material (e.g., oxide, transitional, fresh and ore type blend).
e) The metal prices used for the 2021 Mineral resources are based on a gold price of $1,500 per ounce or A$2,000 per ounce (at an exchange rate of A$1: $0.75). Open pit Mineral resources at the Australian operations are based on revenue factor 1 pits and the underground Mineral resources on appropriate mine design and extraction schedules. The gold price used for Mineral resources approximates 15 % higher than the selected Mineral reserve.
f) The cut-off grade may vary per shaft, open pit or underground mine, depending on the respective costs, depletion schedule, ore type, expected mining dilution and expected mining recovery. The average or range of cut-off grade values applied to the Mineral resources are: Agnew 2.15 g/t to 4.07 g/t Au mill feed (underground) and 0.76 g/t to 0.93 g/t Au mill feed (open pit).
g) The Mineral resources are based on initial assessments at the resource gold price of $1,500/oz and consider estimates of all Agnew costs, the impact of modifying factors such as mining dilution and mining recovery, processing recovery and royalties. Mineral resources are also tested through the application of Environmental, Social and Governance (ESG) criteria to demonstrate reasonable prospects for economic extraction.
h) The Mineral resources are estimated at a point in time and can be affected by changes in the gold price, US Dollar currency exchange rates, permitting, legislation, costs and operating parameters.

Source: Agnew CPR 2021

1.5 Mineral reserve estimates

The Agnew Mineral reserves as at 31 December 2021 are summarized in Table 1.5.1. The Mineral reserves are 100 % attributable to Gold Fields and are net of production depletion up to 31 December 2021. The point of reference for the Mineral reserves is ore delivered to the processing facility.

Table 1.5.1: Agnew - summary of gold Mineral reserves at 31 December 2021 (fiscal year end) based on a gold price of $1,300/oz

	Amount/ (kt)	Grades/ (g/t Au)	Amount/ (koz Au)	Cut-off Grades (g/t Au)	Metallurgical Recovery (%)
Underground Mineral reserves					
UG Proven Mineral reserves	6	5.5	1	2.6 to 4.6	94.04
UG Probable Mineral reserves	4,712	6.4	966	2.6 to 4.6	94.04
UG total Mineral reserves	4,718	6.4	967	2.6 to 4.6	94.04
Open Pit Mineral reserves					
OP Proven Mineral reserves				-	-
OP Probable Mineral reserves	408	3.3	43	0.85 to 0.88	94.99
OP total Mineral reserves	408	3.3	43	0.85 to 0.88	94.99
Stockpile Mineral reserves					
SP Proven Mineral reserves	13	8.0	3	0.9 to 0.99	93.44
SP Probable Mineral reserves					
SP total Mineral reserves	13	8.0	3	0.9 to 0.99	93.44
Total Mineral reserves					
Total Proven Mineral reserves	19	7.2	4		
Total Probable Mineral reserves	5,120	6.1	1,009		
Total Agnew Mineral reserves 2021	5,138	6.1	1,013		
Total Agnew Mineral reserves 2020	5,292	5.4	917		
year-on-year difference (%)	-3%	14%	11%		

Notes:
a) Rounding of figures may result in minor computational discrepancies.
b) Refer to Table 12.5.1 for year-on-year Mineral reserve comparison.
c) Quoted as mill delivered metric tonnes and run-of-mine grades, inclusive of all mining dilutions and gold losses except metallurgical recovery. Metallurgical recovery factors have not been applied to the reserve figures. The approximate metallurgical recovery factor is 94.04 % for underground. The metallurgical recovery is the ratio, expressed as a percentage, of the mass of the specific mineral product recovered from ore treated at the process plant to its total specific mineral content before treatment. The recoveries for Agnew vary according to the mix of the ore source material (e.g., oxide, transitional, fresh and ore type blend) and method of treatment.
d) The metal prices used for the 2021 LoM Mineral reserves are based on a gold price of $1,300 per ounce or A$1,750 per ounce (at an exchange rate of A$1:$0.74). Open pit Mineral reserves at Agnew are based on optimized pits and the underground operations on appropriate mine design and extraction schedules. The gold price used for Mineral reserves is detailed in particularity in chapter 16 Marketing.
e) Dilution relates to planned and unplanned waste and/or low-grade material being mined and delivered to the process plant. Ranges are given for those operations that have multiple orebody styles and mining methodologies. The mine dilution factors range from 11 % to 55 % (open pit) and 13 % to 30 % (underground).
f) The mining recovery factor relates to the proportion or percentage of ore mined from the defined orebody at the gold price used for the declaration of Mineral reserves. This percentage will vary from mining area to mining area and reflects planned and scheduled reserves against actual tonnes, grade and metal mined, with all modifying factors, mining constraints and pillar discounts applied. The mining recovery factors range from 70 % to 93 % (underground) and 72 % to 88 % (open pit).
g) The cut-off grade may vary per open pit or underground mine, depending on the respective costs, depletion schedule, ore type, expected mining dilution and mining and metallurgical recoveries. The average or range of cut-off grade values applied in the planning process are: Agnew 2.6 g/t to 4.46 g/t Au mill feed (underground) and 0.85 g/t to 1.04 g/t Au (open pit).
h) A gold based Mine Call Factor (gold called for over gold accounted for) determined primarily on historic performance but also on realistic planned improvements where appropriate, is applied to the Mineral reserves. A Mine Call Factor of 100 % has been applied at Agnew.
i) The Mineral reserves are estimated at a point in time and can be affected by changes in the gold price, US Dollar currency exchange rates, permitting, legislation, costs and operating parameters.
j) Agnew is 100 % attributable to Gold Fields and is entitled to mine all declared material located within the properties mineral leases and all necessary statutory mining authorizations and permits are in place or have reasonable expectation of being granted.

Source: Agnew CPR, 2021

The Agnew Mineral reserves are the economically mineable part of the measured and indicated Mineral resources based on technical and economic studies completed to a minimum of a pre-feasibility level based on the reserve gold

price of $1,300/oz to justify their extraction as at 31 December 2021. The Agnew life of mine reserve has a pre-feasibility study estimated accuracy of ± 25 % with a contingency lower than or equal to 15 %.

1.6 Capital and operating cost estimates

Major budgeted capital cost items for the 31 December 2021 Mineral reserve life of mine (LoM) plan include underground works, access developments for extensions, additional drilling including the Sheba South 811 drill drive, Sheba vent upgrade, Kath vent upgrade, Kath access and decline and mining studies. Capital has also been attributed to new project startup costs for Barren Lands Open Pit and Underground and Redeemer Zone 2. Exploration expenditure is also budgeted for the growth and resource/reserve conversion pipeline. The forecast capital costs are summarized in Table 1.6.1.

Table 1.6.1: Capital costs ($ million)

Capital cost per item	Units	2022	2023	2024	2025	2026	2027
Capital	$ million	87.5	69.2	62.3	32.3	13.2	1.7

Notes: a) The detailed capital cost schedule is presented in Table 18.1.1
b) This capital summary estimate is for the Mineral reserve life of mine schedule
c) Closure costs are included in operating costs

Source: Agnew CPR, 2021

Budgeted operating costs for the 31 December 2021 Mineral reserve LoM plan are summarized in Table 1.6.2.

Table 1.6.2: Operating costs ($ million)

Operating cost per item	Units	2022	2023	2024	2025	2026	2027
Operating costs	$ million	183.0	163.7	146.7	91.5	67.2	34.3

Notes: a) The detailed operating cost schedule is presented in Table 18.2.1
b) This operating cost summary estimate is for the Mineral reserve life of mine schedule
c) Closure costs are presented from 2026 onwards

Source: Agnew CPR, 2021

The operating costs covers mining, cartage, processing, onsite and offsite administration. This total excludes rehabilitation and closure costs of $43 million, inclusive of the additional provision for new open pits, power station and equipment leasing costs of $117 million.

1.7 Permitting

The key operating environmental permits for the operation are issued by DMIRS and DWER and relate to:

- Mining Proposal which includes Land Clearing, Disturbance and Infrastructure
- Environmental Licence
- Native Vegetation Clearing
- Mine dewatering (category 06)
- Water abstraction and groundwater operating strategies
- Sewerage facility (category 54)
- Putrescible landfill site; and
- Mine Closure Plan

The operation has these permits in place and manage the obligations through the INX InForm (legal register process).

A Mining Proposal has been approved by the Department of Mines, Industry Regulation and Safety for the Barren Lands Open Pit Project. Amendments to the site Environmental Licence which is governed by the Department of Water and Environmental Regulation may be required for dewatering of the open pit during operations or dewatering of the planned Redeemer underground operations.

Heritage surveys were conducted across all future expansion areas to support both mine development and exploration targets. At this stage no Section 18 approvals are required under the Aboriginal Heritage Act to support future operations and drilling.

A Project Management Plan is currently being developed for submission to the Department of Mines, Industry Regulation and Safety for the Barren Lands Open Pit Project, which is a requirement before mining can commence. There are no significant encumbrances to the property or Agnew's ability to execute the life of mine plan from a current or future anticipated permitting perspective.

1.8 Conclusions and recommendations

The Agnew Mineral reserves currently support a 6-year life of mine reserve plan that values the operation at a net present value of $23.7 million at a discount rate of 3.8 % and the reserve gold price of $1,300/oz.

This valuation includes closure liabilities associated with historical and planned mining activities, as well as staff redundancy and power-contract termination liabilities.

Gold Fields' commitment to materiality, transparency and competency in its Mineral resources and Mineral reserves disclosure to regulators and in the public domain is of paramount importance to the Qualified person and the registrants Executive Committee and Board of Directors continue to endorse the company's internal and external review and audit assurance protocols. This Technical Report Summary should be read in totality to gain a full understanding of Agnew's Mineral resource and Mineral reserve estimation and reporting process, including data integrity, estimation methodologies, modifying factors, mining and processing capacity and capability, confidence in the estimates, economic analysis, risk and uncertainty and overall projected property value.

However, to ensure consolidated coverage of the company's primary internal controls in generating Mineral resource and reserve estimates a key point summary is provided in Chapter 21 for reference.

2 Introduction

2.1 Registrant for whom the technical report summary was prepared

The Agnew technical report summary was prepared for Gold Fields Limited (Gold Fields or the Company or the Registrant), a production stage issuer.

2.2 Terms of reference and purpose of the technical report summary

The purpose of this technical report summary is to support the disclosure of Mineral resources and Mineral reserves for the Agnew Gold Mine (Agnew or the Property), a production stage property located in Western Australia (Figure 1.1.1), and the report has been prepared in accordance with the Securities and Exchange Commission (SEC) property disclosure requirements for mining registrants as specified in Subpart 229.1300 of Regulation S-K - Disclosure by Registrants Engaged in Mining Operations.

The effective date of this technical report summary is 31 December 2021.

In addition to this disclosure being in line with the S-K 1300 rule, the Mineral resources and Mineral reserves stated in this technical report summary have also been reported in accordance with the South African Code for the Reporting of Exploration Results, Mineral resources and Mineral reserves (SAMREC Code 2016). SAMREC is aligned to the Committee for Mineral reserves International Reporting Standards (CRIRSCO) Reporting Template November 2019.

2.3 Sources of information

This technical report summary is principally based on information disclosed in the "Competent Person's Report on the Material Assets of Agnew Gold Mine as at 31 December 2021" prepared by Agnew Qualified persons on behalf of the Company and has been reviewed by Regional and Corporate subject matter experts and competent persons. The Competent Person's Report (CPR) was supplemented by technical reports and economic studies prepared by the Company and third-party specialists engaged by the Company as cited throughout this technical report summary and listed in Section 24.

All units of currency are in United States dollars ($). All measurements are metric with the exception of troy ounces (oz).

2.4 Qualified persons and details of inspection

The Qualified persons responsible for the preparation of this technical report summary are listed in Table 2.4.1. All Qualified persons are eligible members in good standing of the South African Mineral Reporting Codes (SAMREC 2016) recognized professional organization (RPO) register within the mining industry. They have at least five years of relevant experience in the type of mineralisation and type of deposit under consideration and in the specific type of activity that the Qualified person is undertaking on behalf of the Company at the time this technical report summary was prepared.

Table 2.4.1: List of Qualified persons

Incumbent	Employer	Position	Affiliations	Relevant experience (years)	Details of inspection	Responsibility
Dr Julian Verbeek	Gold Fields	VP Geology and Mineral resources	FAusIMM - 207994	34	Has not attended site	This document has been prepared under the supervision of and reviewed by Julian Verbeek. Chapters 1-26
Richard Butcher	Gold Fields	Chief Technical Officer GFL Group Technical Services	FAusIMM CP - 211182	41	21 – 22 Feb 2021	Overview and review of document. Chapters 1-5, 10 & 12-26
Dr Winfred Assibey-Bonsu	Gold Fields	Group Geostatistician and Evaluator	FSAIMM - 400112/00	35	Has attended site	Resources Estimation Chapters 8 - 9 & 11
Andrew Engelbrecht	Gold Fields	Group Geologist	AusIMM - 224997	22	Has attended site	Geology and Resources. Chapters 1 - 11
Peter Andrews	Gold Fields	VP: Geotechnical	FAusIMM CP - 302255	25	Has attended site	Geotechnical review. Sections 7.4, 15.2 & 17.3.2
Daniel Hillier	Gold Fields	VP: Metallurgy	FAusIMM CP - 227106	31	20 – 21 Jan 2021	Chapters 10 & 14
Johan Boshoff	Gold Fields	Group Head of Tailings	FAusIMM - 1007564	26	13 Oct 2021 3 Nov 2021	Tailings Review. Sections 15.1 & 17.3.1
Andre Badenhorst	Gold Fields	Group Technical and Reporting Governance Manager	AusIMM - 309882	41	Has attended site	Chapters 1-26
Fiona Phillips	Gold Fields	VP: Technical	AusIMM - 112538	24	Twice a year.	Overview and review of document. Chapters 1-5, 10 & 12-26
Trent Strickland	Gold Fields	Principal Geologist: Resources & Reserves	AusIMM - 211953 AIG - 6761	17	Twice a year.	Geology and Resources. Chapters 1 - 11
Peter Burge	Gold Fields	Manager: Geology	AusIMM - 302309	29	Site employee	Chapters 1-26
Neil Morris	Gold Fields	Superintendent: Mine Planning	AusIMM - 208320	18	Quarterly visits.	Reserves and Mining Chapters 1-5, 10 & 12-26
Stephanie Gotley	Gold Fields	Superintendent: Resource Evaluation	AusIMM - 211515 AIG - 2780	27	Quarterly visits.	Resources Estimation Chapters 8 - 9 & 11

Notes

a) The Qualified persons were not all able to attend site in 2021 for Mineral reserve and Mineral resource reviews, however, the Mineral reserve and Mineral resource were reviewed according to the chapter 21 description. Other Qualified persons have visited the site historically.

The recognized professional organization affiliation in good standing has been reviewed by Gold Fields. The Qualified persons have been appointed by Gold Fields.

2.5 Report version update

This is the maiden technical report summary filed by Gold Fields on the Agnew property in Western Australia.

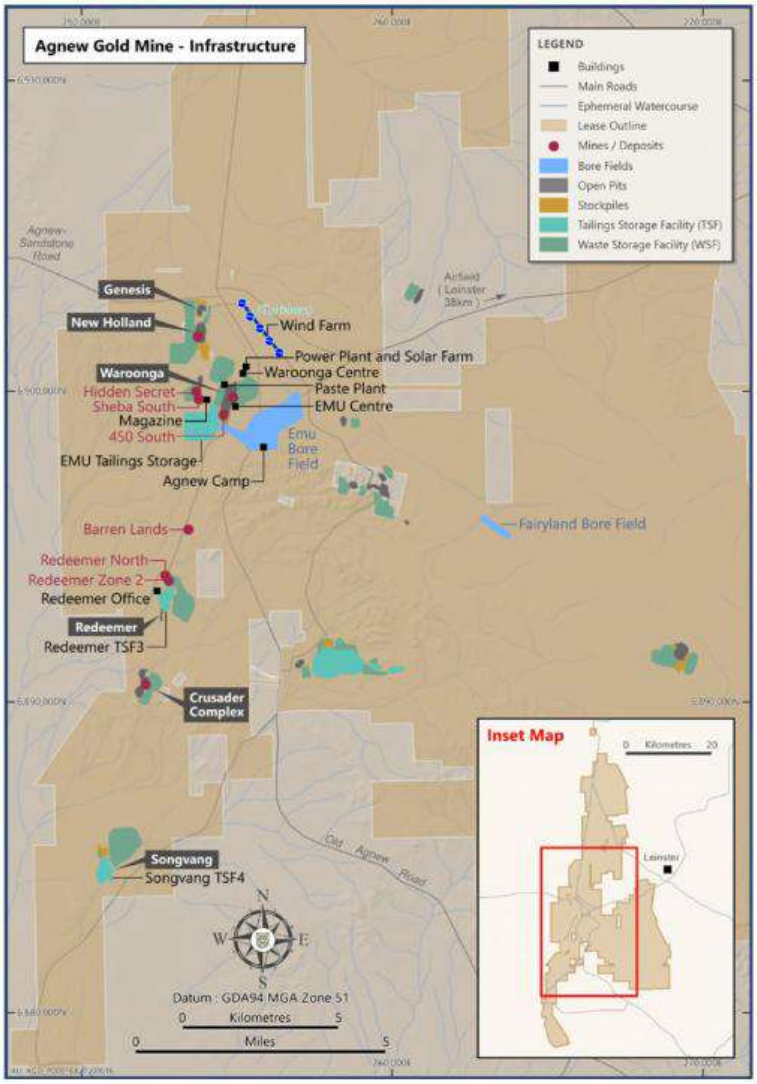
3 Property description

3.1 Property location

Agnew is located approximately 870km by road northeast of Perth, the capital of Western Australia (Figure 1.1.1).

The Property's administration office and process plant is located directly west of the former gold mining town of Agnew shown in Figure 3.1.1, latitude 28º00'39"S and longitude 120º30'59"E or GDA94 / MGA Zone 51 coordinates 255,788 E and 6,899,110 N.

Figure 3.1.1: Agnew operating sites and infrastructure



Source: Agnew CPR, 2021

The nearest population centre is the town of Leinster situated 25km by road to the northeast. The closest major population centre is the city of Kalgoorlie-Boulder (population 29,000), approximately 375km by road to the south.

3.2 Ownership

Agnew Gold Mining Company Proprietary Limited, Australian Company Number 098-385-883, was incorporated in Australia in 2001 as the legal entity holding and conducting mining activity on the Agnew property. Gold Fields has

owned and operated Agnew since 2001. Gold Fields holds 100 % of the issued shares of Agnew through its 100 % attributable holding in the issued shares of Orogen Holding (BVI) Limited.

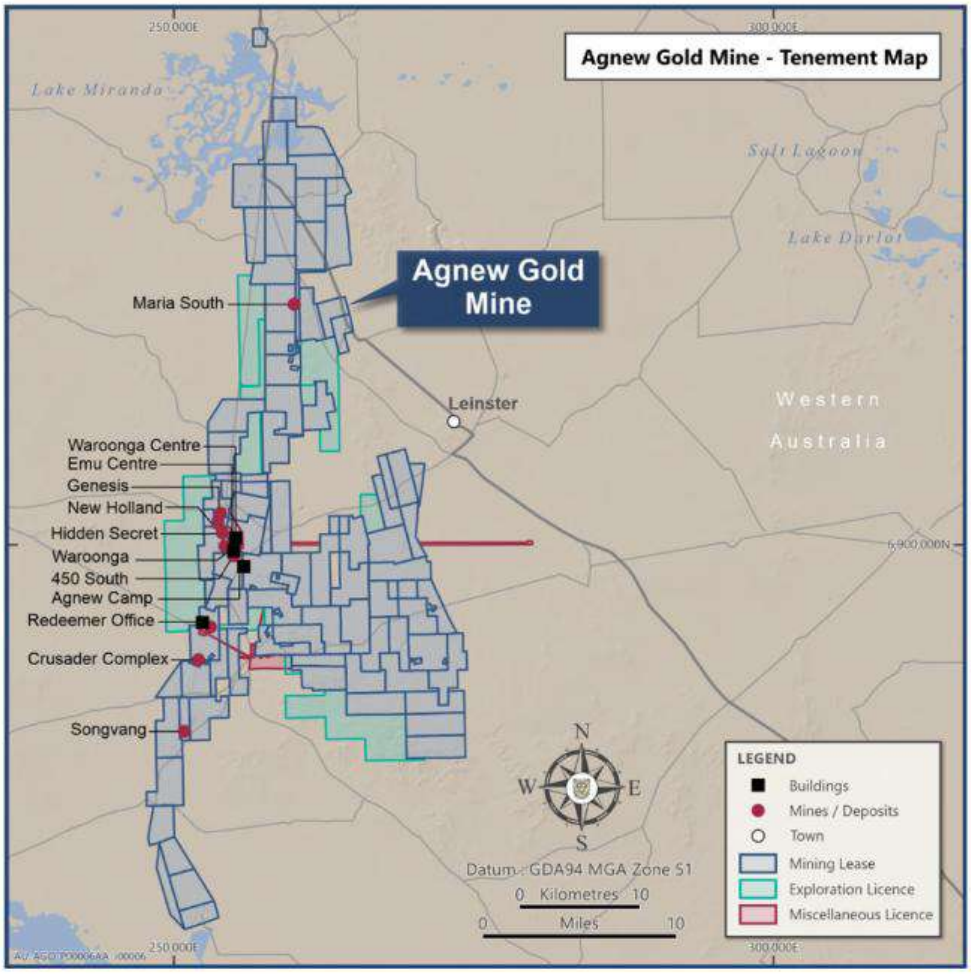
3.3 Property area

Agnew controls exploration and mining tenements covering a total area of 79,357 ha. Agnew has security of tenure for all current exploration and mining tenements that contribute to future Mineral resources and reserves.

3.4 Property mineral titles, claims, mineral rights, leases and options

The Company via its wholly owned subsidiary Agnew has 100 % ownership of 101 granted Mining Leases and 12 granted Exploration Licences covering 78,613 ha, and 21 Miscellaneous Licences covering 744 ha (Figure 3.4.1, Table 3.4.1).

Figure 3.4.1: Agnew mineral titles



Source: Agnew CPR, 2021

Table 3.4.1: List of Agnew tenements

Number	Grant date	Expiry date	Area (HA=hectare) (BL=blocks)	Min annual expenditure ($)	Annual rent ($)	Reporting group	Term granted
Mining Leases							
M 36/113	03/03/1989	02/03/2031	206.60000 HA	15,318	3,370	Agnew - C136/2004	21 Years (Renewed)
M 36/114	03/03/1989	02/03/2031	994.05000 HA	73,630	16,199	Agnew - C136/2004	21 Years (Renewed)
M 36/115	03/03/1989	02/03/2031	900.20000 HA	66,674	14,668	Agnew - C136/2004	21 Years (Renewed)
M 36/116	03/03/1989	02/03/2031	975.90000 HA	72,224	15,889	Agnew - C136/2004	21 Years (Renewed)
M 36/119	03/03/1989	02/03/2031	406.80000 HA	30,118	6,626	Agnew - C136/2004	21 Years (Renewed)
M 36/120	03/03/1989	02/03/2031	942.25000 HA	69,782	15,352	Agnew - C136/2004	21 Years (Renewed)
M 36/121	03/03/1989	02/03/2031	979.50000 HA	72,520	15,954	Agnew - C136/2004	21 Years (Renewed)
M 36/123	10/03/1989	09/03/2031	387.40000 HA	28,712	6,317	Agnew - C136/2004	21 Years (Renewed)
M 36/138	14/07/1989	13/07/2031	572.55000 HA	42,402	9,328	Agnew - C136/2004	21 Years (Renewed)
M 36/139	14/07/1989	13/07/2031	528.60000 HA	39,146	8,612	Agnew - C136/2004	21 Years (Renewed)
M 36/140	14/07/1989	13/07/2031	463.00000 HA	34,262	7,538	Agnew - C136/2004	21 Years (Renewed)
M 36/141	14/07/1989	13/07/2031	791.85000 HA	58,608	12,894	Agnew - C136/2004	21 Years (Renewed)
M 36/142	14/07/1989	13/07/2031	461.90000 HA	34,188	7,521	Agnew - C136/2004	21 Years (Renewed)
M 36/149	13/07/1989	12/07/2031	625.80000 HA	46,324	10,191	Agnew - C136/2004	21 Years (Renewed)
M 36/150	03/08/1989	02/08/2031	398.25000 HA	29,526	6,496	Agnew - C136/2004	21 Years (Renewed)
M 36/163	08/03/1990	07/03/2032	164.75000 HA	12,210	2,686	Agnew - C136/2004	21 Years (Renewed)
M 36/164	07/03/1990	06/03/2032	938.55000 HA	69,486	15,287	Agnew - C136/2004	21 Years (Renewed)
M 36/165	07/03/1990	06/03/2032	861.55000 HA	63,788	14,033	Agnew - C136/2004	21 Years (Renewed)
M 36/166	11/04/1990	10/04/2032	723.65000 HA	53,576	11,787	Agnew - C136/2004	21 Years (Renewed)
M 36/167	11/04/1990	10/04/2032	846.55000 HA	62,678	13,789	Agnew - C136/2004	21 Years (Renewed)
M 36/168	11/04/1990	10/04/2032	774.70000 HA	57,350	12,617	Agnew - C136/2004	21 Years (Renewed)
M 36/171	14/06/1990	13/06/2032	907.05000 HA	67,192	14,782	Lawlers - C014/2003	21 Years (Renewed)
M 36/172	14/06/1990	13/06/2032	799.70000 HA	59,200	13,024	Lawlers - C014/2003	21 Years (Renewed)
M 36/174	06/03/1990	05/03/2032	408.65000 HA	30,266	6,659	Lawlers - C014/2003	21 Years (Renewed)
M 36/182	26/07/1990	25/07/2032	363.25000 HA	26,936	5,926	Agnew - C136/2004	21 Years (Renewed)
M 36/208	12/03/1991	11/03/2033	596.55000 HA	44,178	9,719	Lawlers - C014/2003	21 Years (Renewed)
M 36/233	02/04/1992	01/04/2034	118.55000 HA	8,806	1,937	Agnew - C136/2004	21 Years (Renewed)
M 36/234	02/04/1992	01/04/2034	701.60000 HA	51,948	11,429	Agnew - C136/2004	21 Years (Renewed)
M 36/248	07/12/1992	06/12/2034	33.59000 HA	7,400	554	Agnew - C136/2004	21 Years (Renewed)
M 36/27	30/10/1985	29/10/2027	612.55000 HA	45,362	9,980	Agnew - C136/2004	21 Years (Renewed)
M 36/273	27/10/1993	26/10/2035	480.60000 HA	35,594	7,831	Lawlers - C014/2003	21 Years (Renewed)
M 36/274	27/10/1993	26/10/2035	824.35000 HA	61,050	13,431	Lawlers - C014/2003	21 Years (Renewed)
M 36/275	27/10/1993	26/10/2035	600.05000 HA	44,474	9,784	Lawlers - C014/2003	21 Years (Renewed)
M 36/276	27/10/1993	26/10/2035	917.80000 HA	67,932	14,945	Lawlers - C014/2003	21 Years (Renewed)
M 36/277	27/10/1993	26/10/2035	606.55000 HA	44,918	9,882	Lawlers - C014/2003	21 Years (Renewed)
M 36/278	27/10/1993	26/10/2035	726.50000 HA	53,798	11,836	Lawlers - C014/2003	21 Years (Renewed)
M 36/28	30/10/1985	29/10/2027	23.69000 HA	7,400	391	Lawlers - C014/2003	21 Years (Renewed)
M 36/293	23/02/1994	22/02/2036	27.87500 HA	7,400	456	Lawlers - C014/2003	21 Years (Renewed)
M 36/301	23/06/1994	22/06/2036	706.50000 HA	52,318	11,510	Agnew - C136/2004	21 Years (Renewed)
M 36/313	18/10/1994	17/10/2036	470.75000 HA	34,854	7,668	Lawlers - C014/2003	21 Years (Renewed)
M 36/314	18/10/1994	17/10/2036	722.25000 HA	53,502	11,770	Lawlers - C014/2003	21 Years (Renewed)
M 36/315	05/01/1995	04/01/2037	259.25000 HA	19,240	4,233	Agnew - C136/2004	21 Years (Renewed)
M 36/316	05/01/1995	04/01/2037	137.90000 HA	10,212	2,247	Agnew - C136/2004	21 Years (Renewed)
M 36/317	05/01/1995	04/01/2037	129.85000 HA	9,620	2,116	Agnew - C136/2004	21 Years (Renewed)
M 36/32	23/04/1986	22/04/2028	87.76000 HA	7,400	1,433	Agnew - C136/2004	21 Years (Renewed)
M 36/352	31/03/2000	30/03/2042	456.70000 HA	33,818	7,440	Agnew - C136/2004	21 Years (Renewed)
M 36/353	31/03/2000	30/03/2042	865.60000 HA	64,084	14,098	Agnew - C136/2004	21 Years (Renewed)
M 36/366	09/12/2008	08/12/2029	728.25000 HA	53,946	11,868	Lawlers - C014/2003	21 Years
M 36/367	13/02/2009	12/02/2030	737.75000 HA	54,612	12,015	Lawlers - C014/2003	21 Years
M 36/368	09/12/2008	08/12/2029	121.30000 HA	9,028	1,986	Lawlers - C014/2003	21 Years
M 36/369	13/02/2009	12/02/2030	121.40000 HA	9,028	1,986	Lawlers - C014/2003	21 Years
M 36/380	09/12/2008	08/12/2029	969.20000 HA	71,780	15,792	Lawlers - C014/2003	21 Years
M 36/381	13/02/2009	12/02/2030	949.20000 HA	70,300	15,466	Lawlers - C014/2003	21 Years
M 36/382	17/02/2009	16/02/2030	922.90000 HA	68,302	15,026	Lawlers - C014/2003	21 Years
M 36/383	17/02/2009	16/02/2030	882.45000 HA	65,342	14,375	Lawlers - C014/2003	21 Years
M 36/384	17/02/2009	16/02/2030	971.00000 HA	71,854	15,808	Lawlers - C014/2003	21 Years
M 36/391	17/02/2009	16/02/2030	961.30000 HA	71,188	15,661	Lawlers - C014/2003	21 Years
M 36/401	25/01/2008	24/01/2029	229.70000 HA	17,020	3,744	Lawlers - C014/2003	21 Years
M 36/407	17/02/2009	16/02/2030	7.24450 HA	7,400	130	Lawlers - C014/2003	21 Years
M 36/408	13/04/2007	12/04/2028	485.30000 HA	35,964	7,912	Lawlers - C014/2003	21 Years

Number	Grant date	Expiry date	Area (HA=hectare) (BL=blocks)	Min annual expenditure ($)	Annual rent ($)	Reporting group	Term granted
M 36/411	17/02/2009	16/02/2030	752.90000 HA	55,722	12,259	Lawlers - C014/2003	21 Years
M 36/413	29/08/2011	28/08/2032	634.25000 HA	46,990	-	Agnew - C136/2004	21 Years
M 36/417	23/01/2008	22/01/2029	922.55000 HA	68,302	15,026	Agnew - C136/2004	21 Years
M 36/442	18/02/2009	17/02/2030	606.90000 HA	44,918	9,882	Lawlers - C014/2003	21 Years
M 36/443	25/05/2007	24/05/2028	364.00000 HA	26,936	5,926	Lawlers - C014/2003	21 Years
M 36/450	28/08/2000	27/08/2042	304.55000 HA	22,570	-	Agnew - C136/2004	21 Years (Renewed)
M 36/493	25/05/2007	24/05/2028	121.20000 HA	9,028	1,986	Lawlers - C014/2003	21 Years
M 36/495	23/01/2008	22/01/2029	771.50000 HA	57,128	12,568	Lawlers - C014/2003	21 Years
M 36/496	09/09/2008	08/09/2029	908.45000 HA	67,266	14,799	Lawlers - C014/2003	21 Years
M 36/53	22/09/1988	21/09/2030	854.30000 HA	63,270	13,919	Agnew - C136/2004	21 Years (Renewed)
M 36/55	29/10/1987	28/10/2029	927.10000 HA	68,672	15,108	Agnew - C136/2004	21 Years (Renewed)
M 36/551	28/05/2008	27/05/2029	24.27000 HA	7,400	407	Lawlers - C014/2003	21 Years
M 36/576	23/01/2008	22/01/2029	892.20000 HA	66,082	14,538	Lawlers - C014/2003	21 Years
M 36/577	23/01/2008	22/01/2029	808.75000 HA	59,866	13,171	Lawlers - C014/2003	21 Years
M 36/578	23/01/2008	22/01/2029	908.10000 HA	67,266	14,799	Lawlers - C014/2003	21 Years
M 36/579	09/09/2008	08/09/2029	904.10000 HA	66,970	14,733	Lawlers - C014/2003	21 Years
M 36/614	05/12/2002	04/12/2023	9.53300 HA	7,400	163	Lawlers - C014/2003	21 Years
M 36/62	22/09/1988	21/09/2030	256.50000 HA	19,018	4,184	Agnew - C136/2004	21 Years (Renewed)
M 36/622	13/06/2005	12/06/2026	926.40000 HA	68,598	15,092	Lawlers - C014/2003	21 Years
M 36/623	13/06/2005	12/06/2026	725.95000 HA	53,724	11,819	Lawlers - C014/2003	21 Years
M 36/624	18/02/2009	17/02/2030	242.75000 HA	17,982	3,956	Lawlers - C014/2003	21 Years
M 36/63	22/09/1988	21/09/2030	970.05000 HA	71,854	15,808	Agnew - C136/2004	21 Years (Renewed)
M 36/635	18/02/2009	17/02/2030	724.00000 HA	53,576	11,787	Lawlers - C014/2003	21 Years
M 36/636	18/02/2009	17/02/2030	439.05000 HA	32,560	7,163	Lawlers - C014/2003	21 Years
M 36/637	17/03/2006	16/03/2027	9.72200 HA	7,400	163	Lawlers - C014/2003	21 Years
M 36/65	22/09/1988	21/09/2030	686.50000 HA	50,838	11,184	Agnew - C136/2004	21 Years (Renewed)
M 36/66	22/09/1988	21/09/2030	331.80000 HA	24,568	5,405	Agnew - C136/2004	21 Years (Renewed)
M 36/680	17/09/2010	16/09/2031	1.68150 HA	3,700	33	Agnew - C136/2004	21 Years
M 36/69	22/09/1988	21/09/2030	485.45000 HA	35,964	7,912	Agnew - C136/2004	21 Years (Renewed)
M 36/694	17/09/2020	16/09/2041	9.70858 HA	7,400	163	Lawlers - C014/2003	21 Years
M 36/695	07/08/2020	06/08/2041	99.33887 HA	7,400	1,628	Agnew - C136/2004	21 Years
M 36/70	22/09/1988	21/09/2030	773.65000 HA	57,276	12,601	Agnew - C136/2004	21 Years (Renewed)
M 36/71	22/09/1988	21/09/2030	975.85000 HA	72,224	15,889	Agnew - C136/2004	21 Years (Renewed)
M 36/72	22/09/1988	21/09/2030	901.15000 HA	66,748	14,685	Agnew - C136/2004	21 Years (Renewed)
M 36/73	22/09/1988	21/09/2030	999.80000 HA	74,000	16,280	Agnew - C136/2004	21 Years (Renewed)
M 36/74	22/09/1988	21/09/2030	814.75000 HA	60,310	13,268	Agnew - C136/2004	21 Years (Renewed)
M 36/75	22/09/1988	21/09/2030	999.45000 HA	74,000	16,280	Agnew - C136/2004	21 Years (Renewed)
M 36/77	22/09/1988	21/09/2030	475.00000 HA	35,150	7,733	Agnew - C136/2004	21 Years (Renewed)
M 36/89	17/06/1988	16/06/2030	899.35000 HA	66,600	14,652	Agnew - C136/2004	21 Years (Renewed)
M 36/90	17/06/1988	16/06/2030	986.30000 HA	73,038	16,068	Agnew - C136/2004	21 Years (Renewed)
M 36/91	27/07/1988	26/07/2030	227.05000 HA	16,872	3,712	Lawlers - C014/2003	21 Years (Renewed)
Exploration Licences							
E 36/610	14/01/2008	13/01/2022	7 BL	51,800	3,507	Agnew - C136/2004	5 Years (Extended)
E 36/782	21/05/2013	20/05/2023	5 BL	37,000	2,505	Agnew - C136/2004	5 Years (Extended)
E 36/828	01/07/2014	30/06/2024	5 BL	37,000	2,505	Agnew - C136/2004	5 Years (Extended)
E 36/829	01/07/2014	30/06/2024	9 BL	51,800	4,509	Agnew - C136/2004	5 Years (Extended)
E 36/836	23/03/2016	22/03/2026	13 BL	37,000	3,444	Lawlers - C014/2003	5 Years (Extended)
E 36/849	01/12/2015	30/11/2025	1 BL	11,100	300	Agnew - C136/2004	5 Years (Extended)
E 36/859	23/03/2016	22/03/2026	4 BL	22,200	1,060	Lawlers - C014/2003	5 Years (Extended)
E 36/867	06/09/2016	05/09/2021	17 BL	22,200	4,504	Lawlers - C014/2003	5 Years
E 36/872	08/11/2016	07/11/2021	1 BL	7,400	300	Agnew - C136/2004	5 Years
E 36/881	02/07/2018	01/07/2023	4 BL	14,800	776	Lawlers - C014/2003	5 Years
E 36/883	14/03/2017	13/03/2022	1 BL	7,400	300	Lawlers - C014/2003	5 Years
E 36/889	05/04/2017	04/04/2022	2 BL	14,800	530	Lawlers - C014/2003	5 Years
Miscellaneous Licences							
L 36/143	05/10/2000	04/10/2042	14.00000 HA		204		21 Years (Renewed)
L 36/144	04/10/2000	03/10/2042	11.00000 HA		160		21 Years (Renewed)
L 36/150	15/11/2000	14/11/2021	5.00000 HA		73		21 Years
L 36/152	15/11/2000	14/11/2021	7.00000 HA		102		21 Years
L 36/153	15/11/2000	14/11/2021	3.00000 HA		44		21 Years
L 36/154	30/11/2000	29/11/2021	2.00000 HA		29		21 Years
L 36/156	08/07/2002	07/07/2023	2.20000 HA		44		21 Years

Number	Grant date	Expiry date	Area (HA=hectare) (BL=blocks)	Min annual expenditure ($)	Annual rent ($)	Reporting group	Term granted
L 36/162	12/09/2002	11/09/2023	3.00000 HA		44		21 Years
L 36/173	27/07/2005	26/07/2026	2.80000 HA		44		21 Years
L 36/177	27/07/2005	26/07/2026	5.00000 HA		73		21 Years
L 36/211	16/04/2013	15/04/2034	7.57950 HA		117		21 Years
L 36/212	16/04/2013	15/04/2034	11.02000 HA		175		21 Years
L 36/224	04/05/2018	03/05/2039	193.36000 HA		2,828		21 Years
L 36/226	04/07/2018	03/07/2039	12.36000 HA		190		21 Years
L 36/227	03/07/2018	02/07/2039	47.62000 HA		700		21 Years
L 36/228	13/08/2018	12/08/2039	371.48950 HA				21 Years
General Purpose Leases							
G 36/36	02/04/1992	01/04/2034	9.95100 HA		146		21 Years (Renewed)
G 36/37	02/04/1992	01/04/2034	9.96900 HA		146		21 Years (Renewed)
G 36/38	02/04/1992	01/04/2034	9.88700 HA		146		21 Years (Renewed)
G 36/39	02/04/1992	01/04/2034	9.96600 HA		146		21 Years (Renewed)
G 36/42	07/06/1994	06/06/2036	6.21150 HA		102		21 Years (Renewed)

Notes: a) Registered Holder - Agnew Gold Mining Company Pty Limited
b) The Qualified persons opinion is that licences and tenements can be renewed or extended as required

Source: Gold Fields Australia tenement database

3.5 Mineral rights description

The operation of mining and associated activities at Agnew are governed by numerous Western Australian Government Acts. This section summarises published information available from the Western Australian Department of Mines, Industry Regulation and Safety (DMIRS) website.

The Western Australian Mining Act 1978 (the WA Mining Act,1978) is the principal legislation governing exploration and mining on land in Western Australia. Licences and leases for, among other things, prospecting, exploration and mining must be obtained pursuant to the requirements of the Mining Act (1978) before the relevant activity can begin. Application fees and annual rental payments are payable in respect of each tenement. Where Native Title has not been extinguished, Native Title legislation may apply to the grant of tenure and some subsequent administrative processes. Heritage legislation may operate to preclude or regulate the disturbance of a particular area. The life of mine reserve has or is reasonably expected to receive grant of tenure.

Exploration Licences are granted for five years plus a possible extension of five years and further periods of two years thereafter with 40 % per cent of ground to be surrendered at the end of year six.

If the holder of an Exploration Licence establishes indications of an economic mineral deposit and expends a minimum level of investment, it may apply for a Mining Lease which gives the holder exclusive mining rights with respect to all minerals on the property. It is possible for one person to own the surface of the property and for another to own the mineral rights.

An application for a Mining Lease must be accompanied by one of the following:

- A Mining Proposal completed in accordance with the guidelines.
- A statement of mining operations and a mineralisation report prepared by a Qualified person.

A statement of mining operations and a resource report that complies with the JORC Code (Joint Ore Reserves Committee guidelines for Mineral resource and ore reserve reporting) that applies to the Australian Securities Exchange (ASX).

The maximum initial term of a Mining Lease is 21 years and the holder has the right to renew the lease for a further period of 21 years. Subsequent renewals are subject to the minister's discretion and the lease can only be assigned with the consent of the relevant minister.

Prescribed minimum annual expenditure commitments and activity reporting requirements apply to holders of Exploration Licences and Mining Leases. Mining operations on tenements in Western Australia must be developed and operated in compliance with various Commonwealth and State legislative requirements.

Agnew gold mine is under the control of the following Western Australian Government legislation:

- Mining Act (1978)
- Environmental Protection Act (1986) and Environmental Protection Regulations (1987)
- Environmental Protection (Clearing of Native Vegetation) Regulations (2004)
- Environmental Protection (Unauthorized Discharge) Regulations (2004)
- Contaminated Sites Act (2003)
- Rights in Water and Irrigation Act (1914)
- Conservation and Land Management Act (1984)
- Country Areas Water Supply Act (1947)
- Aboriginal Heritage Act (1972)
- Mining Rehabilitation Fund Act (2012)

Agnew gold mine is also under the authority of the following Commonwealth of Australia Government legislation:

- Environmental Protection and Biodiversity Conservation Act (1999)
- National Greenhouse and Energy Reporting Act (2007)

The governing Western Australian agencies are the Western Australian Department of Water and Environmental Regulation (DWER), the Western Australian Department of Planning, Lands and Heritage (DPLH) and the Western Australian Department of Mines, Industry Regulation and Safety (DMIRS).

Agnew holds regulatory licences and registrations that govern various aspects of environmental management as disclosed in Section 17.

Miscellaneous licences are for purposes such as a roads and pipelines. General purpose leases are for purposes such as operating plant and machinery, other infrastructure or depositing tailings.

Mineral royalty rates are prescribed under the Mining Regulations 1981. For gold, an ad valorem royalty rate of 2.5 % is applied.

3.6 Encumbrances

Other regulatory requirements including those associated with operation and management of mining, rehabilitation and exploration activities are managed under the Western Australian Mining Act (1978) in the form of tenement conditions administered by the Western Australian Department of Mines, Industry Regulation and Safety.

Section 17 discloses the remediation and reclamation guarantees that are pertinent to Agnew.

Agnew received no fines during 2021.

3.7 Other significant factors and risks

There are no other significant factors and risks known at the time of this report that may affect access, title, or the right or ability to perform work on the Property and therefore execute the life of mine plan.

If mine expansions are required into areas currently held under an Exploration Licence, conversion to a Mining Lease is required prior to the commencing of mining. This may also trigger negotiations under the Native Title Act 1993 (Cth) with relevant Traditional Owners, which must be undertaken prior to the grant of tenure. Aboriginal cultural

heritage consultation, surveys and approvals are required for most mining and exploration activities, which requires engagement with relevant Traditional Owners. In some cases, agreements exist to facilitate this process. The permitting and licencing requirements required to start a new mining operation (or to expand or modify existing operations) may also include local disturbance, clearing, environmental, power, water extraction and waste disposal, which follow well-established authorization protocols with the relevant government authorities.

The Qualified person is not aware of any other current or pending licencing or legal matters that may have an influence on the rights to explore or mine for minerals at Agnew. The Qualified person has relied on information provided by the Registrant in preparing its findings and conclusions regarding other significant factors and risks.

A review of recent Company public disclosure documents including the annual report (Form 20-F for the 12 months Ended 31 December 2021) do not contain any statements by the directors on any legal proceedings or other material conditions (other than as set out above) that may impact on the Company's ability to continue mining or exploration activities at Agnew.

3.8 Royalties or similar interest

There are no non managed tenements, the Warrida Well Joint venture was dismantled in 2021and there are no royalties or similar interests

The Qualified person has reviewed the limited non-managed tenements and is of the opinion that it has not been explored on in 2021. Any discoveries will be considered as attributable to Gold Fields.

4 Accessibility, climate, local resources, infrastructure and physiography

4.1 Topography, elevation, and vegetation

The topography across Agnew's property is characterized by flat to undulating plains with elevations ranging from 500 – 540 m above sea level (ASL). Elevated areas correspond to outcrops of bedrock (greenstone) and are separated by extensive areas of sand plain above granitoid intrusives. Sharp breaks in elevation are associated with lateritic mesas, referred to as breakaways.

The Agnew operations lie within the Austin Botanical district of the Eremaean botanical province of Western Australia. The vegetation is characterized by low woodland/shrubland on red loams or hardpans, with a total of six vegetation types described in Table 4.1.1.

Table 4.1.1: Vegetation types within the Agnew project area

Habitat		Vegetation Description
Flood plains		Eremophila galeata open low scrub
Gibber plains		Acacia aneura (and allied genera) open scrub over Eremophila forrestii subsp. forrestii and Eremophila platycalyx subsp. platycalyx open low scrub B over Ptilotus obovatus var. obovatus open dwarf scrub
Hardpan plains	Inter groves	Acacia aneura (and allied genera) and Acacia ramulosa var. linophylla open scrub over Eremophila forrestii subsp. forrestii and Eremophila spectabilis subsp. brevis open low scrub over Eregrostis eriopoda, Eriachne mucronata and Eriachne helmsii low grass
	Mulga groves	Acacia aneura (and allied genera) open low forest over Eremophila forrestii subsp. forrestii and Eremophila spectabilis subsp brevis heath
Unincised drainage lines		Acacia aneura (and allied genera) scrub over Eremophila galeata and Acacia tetragonophylla open low scrub over Eriachne mucronata and Eriachne helmsii open low grass
Wanderrie sandy bank plains		Acacia aneura (and allied genera) and Acacia ramulosa var. linophylla open scrub over Eremophila forrestii subsp. forrestii, Eremophila spectabilis subsp. brevis low scrub over Eragrostis eriopoda and Eriachne helmsii open low grass.

Source: Agnew Mine Closure Plan 2020

Vegetation and topsoil, to a depth of approximately 200 millimetres, will be reserved, in piles less than 1 m deep and to the southern end of the proposed disturbance area, where it will not be impacted by machinery. The infrastructure will be removed and topsoil and vegetation will be reapplied to the surface on completion of batching activities. The infrastructure will be removed and topsoil and vegetation will be reapplied to the surface on completion of mining activities. The area will be ripped and seeded with local species subsequent to topsoil replacement.

Revegetation of the waste dumps will involve determining the viability of seed in the topsoil, and where necessary making additional applications of seed. Seeds from local plants will be collected and applied to the waste dump and surface rehabilitation. Much of this seed will be harvested from our own onsite seed orchard. Seeds will cover a full range of annuals, herbs, shrubs and tree species.

4.1.1 Lawlers Project Area

The most common vegetation communities within the Lawlers area are open to very open Acacia aneura (and allied genera) and/or Acacia craspedocarpa shrubland. Other communities include riparian communities of Mulga (Acacia aneura and allied genera) and River Red Gum (Eucalyptus camuldulensis) and Cue York Gum (Eucalyptus striaticalyx) woodlands. The existing level of diversity will be considered during closure planning and when rehabilitation activities are undertaken, in particular when the seed mixes for revegetation are selected.

The Qualified person's opinion is that the revegetation proposed will adequately remediate any disturbance to the satisfaction of the community and authorities and the revegetation of tailings dams will be in line with Company procedures and will minimize toxins.

4.2 Access

Access to Agnew is via a sealed road 24km from the Goldfields Highway, which links the town of Leinster with Kalgoorlie to the south (Figure 3.1.1). The Property is also serviced by regular flights from Perth to an airport operated by BHP Billiton Nickel West Pty Ltd approximately 15km to the north of Leinster.

4.3 Climate

Agnew is in a semi-arid environment with a mean daily maximum temperature of 37.3 °C in January and 18.7 °C in July. Mean minimum temperatures are 23.2 °C in January and 6.1 °C in July. Temperature extremes range from below freezing on winter nights to above 45 °C on summer days.

Mean annual rainfall is 275 mm and although the mean monthly rainfall is relatively consistent, high rainfall events can occur during late summer and early autumn due to remnant cyclonic activity. However, these events are relatively rare and have little effect on mine operations.

The most reliable rains occur in winter from cold fronts arriving from the west, and cloud bands from the northwest. January and February are the wettest months with an average of above 40 mm. Evaporation rates are high and there are no naturally occurring perennial lakes, streams or rivers in the region.

The mine regularly conducts climate change risk and vulnerability assessments, and develop adaptation and mitigation plans to address and identified risks. There are no extreme climate conditions are experienced that materially affect operations.

4.4 Infrastructure

Agnew is currently an underground gold mining operation with associated infrastructure and facilities that operate year-round. In addition to the Waroonga and New Holland underground mines accessed by declines, major infrastructure owned and operated by the Company includes a 1.3 Mt per annum carbon in pulp process plant, tailings storage facilities, paste plant, haul roads, administration centres and an accommodation camp.

The process plant and main administration offices are located directly west of the historic Agnew town (Figure 3.1.1). The process plant consists of a tertiary crushing circuit, a two-stage ball milling circuit with gravity and a conventional carbon in pulp gold recovery circuit. Other significant facilities in this area include engineering workshops, fuel storage, a medical centre, warehouses and reagent facility.

Mining activities have removed most tailings storage facility 'TSF 1', and the small amount of material that remains is buried under tailings storage facility 'TSF 2' and a haul road. TSF 2 is a decommissioned above ground paddock tailings storage facility. The tailings in TSF 2 are dry and present a low risk both from a safety and environmental perspective and are being extracted for use in the paste plant to enable underground stope void support. Tailings storage facility 3 'TSF 3' is an in-pit facility at the former Redeemer open pit. Tailings storage facility 4 'TSF 4') is also an in-pit facility at the former Songvang open pit. All the Lawlers tailing storage facilities are closed and rehabilitated.

Both underground operations have a dedicated facility for mining engineering, engineering workshops, geology, mine safety, mobile maintenance, warehousing, fuel storage and washdown areas. Other infrastructure maintained on site to support the mining operation are a surface paste plant and refrigeration and cooling for underground ventilation.

Water is sourced from the underground mines, former open pits and three borefields: Fairyland, New Woman and EMU. Fairyland is the main source of bore water and hydrogeological studies recently completed confirm that the aquifer can support the Agnew life of mine reserve operations. Bore water is stored in a historic open pit.

The bulk of the water is currently supplied from the mining operations and recovered from the in-pit tailings facility and previously mined pits. The water reticulation recovers water from the water storage open pit.

A recently commissioned hybrid renewable power plant owned and operated by EDL Energy comprising solar panels, wind turbines, and battery power storage power provides Agnew with 50 % to 60 % renewable energy, and with gas/diesel back-up is a key contributor to the security of power for the life of mine.

The majority of the Agnew workforce are fly-in fly-out (FIFO) from Perth with a small number of employees residing in Leinster and other regional centres including Geraldton and Kalgoorlie. Work rosters are predominantly based on 8 days on, 6 days off cycles; however, some contractors operate on longer rosters such as 2 weeks on, 1 week off.

Supplies are delivered to site via road transport from either Kalgoorlie or Perth via the Goldfields and Great Northern Highways.

The closest population centre is the town of Leinster with approximately 1,300 people. The town was established in 1976 as a dormitory town predominantly for workers at the nearby nickel mines. Facilities include a supermarket, post office, service station, primary school, tavern and various sporting facilities.

4.5 Book Value

The economic analysis disclosed in chapter 19 is in respect of attributable Mineral reserves only and excludes Mineral resources and lower grade material. The assumptions, parameters and cashflows are only intended to support the reserve declaration of the operation. Certain assumptions and estimates might differ from the long-term outlook or actual results of the operation, including the commodity prices used, which are materially different from current spot prices. Changes in these assumptions may result in significant changes to mine plans, models and the NPV of the operation. The Mineral reserves will therefore not necessarily represent the total future economic benefit that can be derived from the Property.

Net book value of property plant and equipment consists mainly out of land, mining infrastructure, mine development, mineral and surface rights and processing plant related assets of the Property. Agnew has a book value of $280.5. The Qualified person is of the opinion that the book value estimated as described is expected to be different to the NPV for the attributable reserve only.

5 History, previous owners and operators

Gold was discovered at Lawlers, 10km south of Agnew township, in 1894 (Figure 3.1.1). The Waroonga mine at Agnew was also developed around this time with ore trammed to the Great Eastern mine at Lawlers for treatment.

The Waroonga mine was closed in 1912 due to poor performance and was subsequently purchased by East Murchison United Limited (EMU) in 1934. A treatment plant was constructed in 1936 and the mine, now known as the EMU mine, operated until its closure in 1948 due to high groundwater inflows and corporate issues.

Despite further exploration by the Kim Syndicate, Western Australian Mines Department and Western Mining Corporation Holdings Limited from 1948 to 1975, including the sinking of a 63 m shaft, funds to develop the orebodies could not be raised. Western Mining Corporation exercised an option to purchase the EMU mine in 1976 after intersecting gold mineralisation below the old workings.

Percussion and diamond drilling was undertaken by Western Mining Corporation to test the open pit potential of the area. This was followed by test pitting in 1985 and full-scale open pit mining from 1986, with ore treated at the 0.5 Mt per annum EMU processing facility. Western Mining Corporation also entered into a joint venture with Nord Australex Pty Ltd in 1985 to explore for EMU style mineralisation to the south of Agnew, leading to the discovery of the Redeemer and Deliverer orebodies. Open pit mining commenced at Redeemer in 1988.

Forsayth NL purchased the Great Eastern leases at Lawlers in 1984, with open pit mining commencing at Great Eastern in 1986 followed by the development of McCaffery and several smaller satellite open pits. All ore was treated at Forsayth's processing facility located at Great Eastern.

The Cox orebody was discovered by Asarco Australia 400 m south of Deliverer in 1987. A small open pit was developed with the ore treated at Forsayth's facility. Western Mining Corporation subsequently discovered the Crusader orebody to the immediate north of Cox.

During 1989, the throughput of the EMU plant was increased to 1.3 Mt per annum and underground operations commenced at EMU followed by Redeemer in 1990. Forsayth discovered the Genesis-New Holland deposits to the immediate northwest of EMU in 1990 with two open pit operations subsequently developed.

In 1992, underground mining was suspended at EMU following a major flood event. Western Mining Corporation purchased the Cox leases from Asarco and extended the open pit. Forsayth was acquired by Plutonic Resources Ltd who continued to operate the Genesis-New Holland mine and discovered and developed the Fairyland open pit in the southeast of the Property.

In 1994, the Crusader underground mine was developed by Western Mining Corporation. Homestake Mining Company acquired Plutonic Resources in 1998 and commenced the New Holland underground mine.

During 2001, Gold Fields acquired Agnew from Western Mining Corporation and Barrick Gold merged with Homestake. A decline was developed to access the Kim and Main lodes at Waroonga in 2002 following the closure of the Redeemer underground mine. Infill and extensional drilling resumed on the Songvang open pit deposit in the south of the Property.

During 2003 and 2004, open pit mining ceased at Waroonga and an exploration drive was developed into the Rajah lode at the northern end of the open pit. Ore production from the Songvang open pit commenced in 2005 along with trial stoping at Waroonga Main lode.

Ongoing drilling at Waroonga continued to extend the known limits of Kim and Main lodes with the high-grade Fitzroy, Bengal and Hastings shoots (or FBH lodes) discovered beneath Main lode in 2011. A cut-back of the Songvang northern pit was completed in 2012.

The Company acquired the Lawlers property from Barrick Gold in September 2013 and integrated the New Holland complex with Waroonga following closure of the Lawlers process plant.

The Qualified person is of the opinion that the historic exploration results have been superseded and supplemented by more recent exploration undertaken by Gold Fields for areas of current interest and that any historic errors or deficiencies will have little influence on the current Mineral resource models or the life of mine reserves.

6 Geological setting, mineralisation, and deposit

6.1 Geological setting

Agnew is located in the northern portion of the north-northwest trending Archean Norseman-Wiluna Greenstone Belt, which forms part of the Yilgarn Craton, a 2.7 Ga granite-greenstone terrain in southern Western Australia.

The rocks of the belt comprise abundant tholeiitic and komatiitic volcanic rocks, cherts, sulphidic and albitic sedimentary rocks, and a chain of discrete felsic volcanic centres. There is limited banded iron formation (BIF) compared with the other greenstone belts in the Yilgarn Craton. The gross structure is markedly linear, with north-northwest trending strike-slip faults traceable for hundreds of kilometres, which disrupt the greenstone belt into fault-bound domains. In comparison to other greenstone belts in the Yilgarn Craton, the Norseman-Wiluna Greenstone Belt is enriched in gold and nickel mineralisation.

The stratigraphic succession in the Agnew area comprises tholeiitic basalts, high-Mg basalts and ultramafic flows over two magmatic cycles. The lower mafic/ultramafic volcanic pile is intruded by a series of layered mafic intrusions, fractionated from quartz dolerite roofs to pyroxenite basement. Unconformably overlying the lower Agnew greenstone sequence are two sedimentary basins; the Vivien Formation volcaniclastics folded around the north-plunging Mt White syncline in the north of the Property and conglomerates, arenaceous metasediments and greywackes of the Scotty Creek Formation to the west of the Property. Plutonic rocks ranging in composition from tonalite to monzogranite form the Lawlers granitic complex and intrude the hinge of the north-plunging Lawlers anticline in the south of the Property.

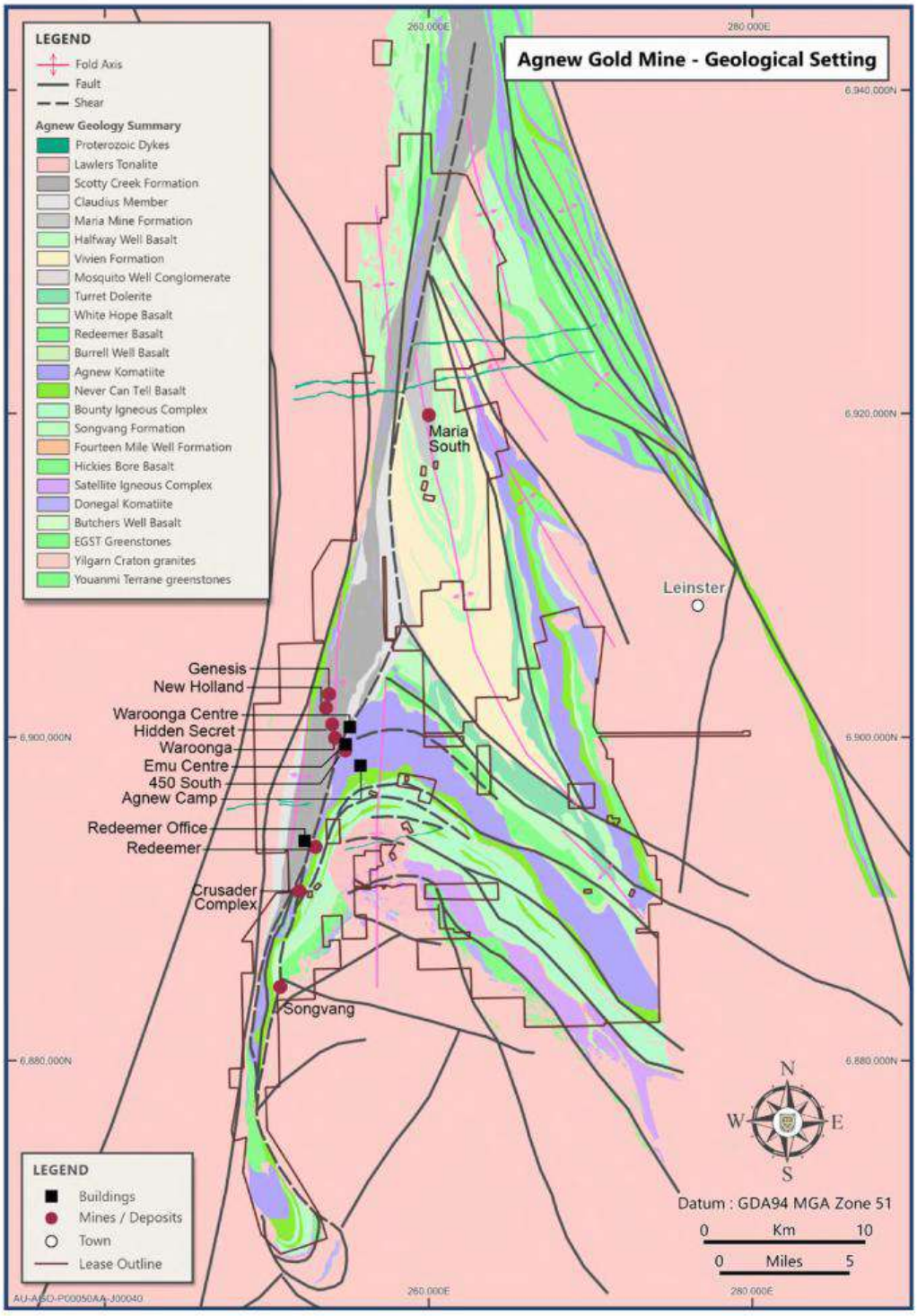
The succession is metamorphosed to upper greenschist-lower amphibolite metamorphic facies.

The Waroonga, New Holland and Redeemer complexes are situated on the western limb of the Lawlers Anticline in proximity to the north-northeast trending EMU shear. Further west, the Scotty Creek metasediments are in fault contact with the regional-scale, Waroonga Shear flanking granite-gneiss terrain.

The Archean basement rocks range from unweathered outcrop to deeply weathered under Tertiary and Quaternary regolith. The weathering horizons are variably exposed, stripped or buried by localized thick accumulations of Permian sedimentary rocks or blanketed by more recent sediments that have in turn been lateritised. The depth of weathering is strongly controlled by rock-type, with ultramafic to mafic rocks generally being more susceptible to weathering than intermediate to felsic rocks.

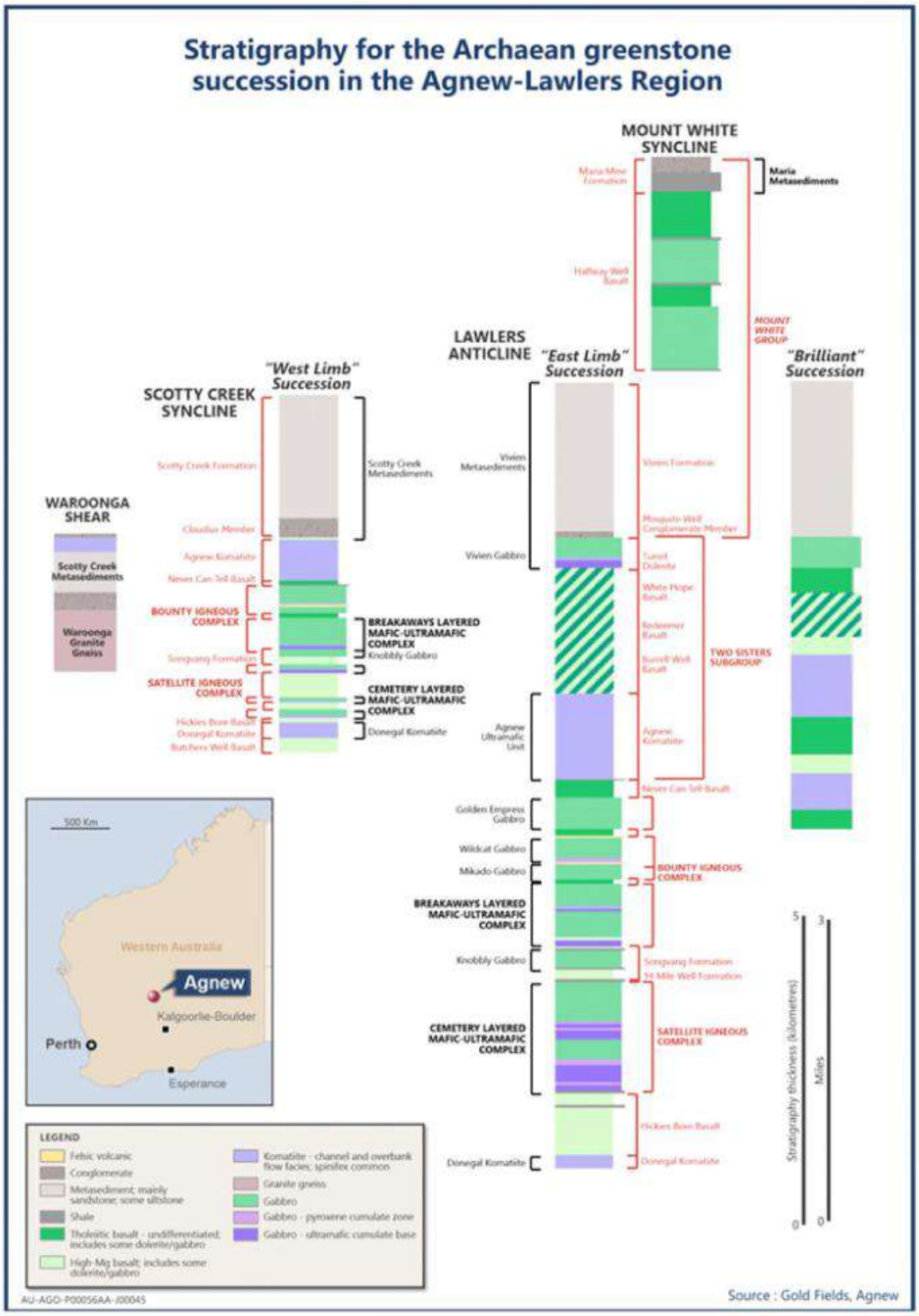
The regional geology is shown in Figure 6.1.1 with a stratigraphic column presented in Figure 6.1.2.

Figure 6.1.1: Generalized geology of Agnew



Source: Agnew CPR, 2021

Figure 6.1.2: Stratigraphic column of Lawlers anticline in Western Australia



Notes: a) Modified from Beardsmore, 2002

Source: Agnew CPR, 2021

6.2 Mineralisation

Gold deposits along the Norseman-Wiluna Greenstone Belt are hosted within a diverse range of rocks, including basalts and dolerites, fine to coarse-grained sedimentary rocks, and felsic to intermediate intrusives. Host rocks are commonly metamorphosed to greenschist or lower amphibolite facies. Gold mineralisation is typically structurally controlled, occurring within a network of shear zones proximal to major regional faults. The most important gold mineralisation styles are shear hosted quartz-carbonate bearing breccia lodes and associated quartz vein arrays, together with finely disseminated gold associated with zones of strong hydrothermal alteration. Alteration comprises silica or albite-rich zones, associated with ankerite, sericite, biotite or amphibole, together with pyrite, pyrrhotite or arsenopyrite as sulphide-bearing phases.

The most substantial gold deposits and the focus of most previous exploration and mining activity at Agnew are located along the western limb of the Lawlers anticline (Waroonga, Redeemer and New Holland complexes) spatially related to the north-northwest trending Waroonga and EMU shears.

The major deposits are listed in Table 7.5.1. The continuity of the major deposits is. included in Section 11.1.6.

Although all Agnew deposits broadly occur at the intersections between structures and stratigraphy, there are subtle differences in alteration and mineralisation that are controlled in part by the local host rock chemistry. Mineralisation zones are discontinuous with short range predictability.

Significant deposits are also found on the eastern limb (e.g. McCaffery, Fairyland) and associated with late-stage geological cross-structures (Lawlers). These deposits were explored and mined by previous owners of the Property.

While most of the western limb deposits are broadly related to intersections between structures and mafic-ultramafic stratigraphy, there are subtle differences in alteration and mineralisation controlled in part by the local host rock chemistry. Songvang is unusual in its relatively high lead, silver and fluorine content, possibly reflecting input from tonalite and porphyry intrusions. There also appears to be a slight decline in mineralisation temperatures from south to north, associated with the north plunge of the Lawlers anticline and resultant erosion of the overlying, lower temperature rocks to the south. This temperature change is reflected in the changing mineralisation styles from south to north, with biotite-garnet alteration assemblages dominating to the south and quartz veining to the north.

The geological model and basis of the exploration programme is guided by a structurally controlled orogenic gold deposit model.

Table 6.2.1: Summary of deposit dimensions, geological setting and mineralisation style

Mineral resource	Host rock	Structure	Lode style	Alteration assemblage		Main domain	Length (m)	Width (m)	Depth (m)
				outer	inner				
Claudius	Basalt	Sub-vertical NW-SE and N-S shearing	Shear intersection with basalt/ultramafic contact	Chlorite ± epidote	Chlorite, magnetite ± biotite ± epidote	Basalt lode	830 m	150 m	55 m
Maria	Scotty Creek Sandstone / Conglomerate	Sub-vertical N-S shearing (axial planar to Lawlers anticline.)	Subvertical quartz breccia vein and/or tension veins	Arsenopyrite-silicification-quartz	Quartz-silicification-arsenopyrite	Main lode	430 m	85 m	2 m
Cams	Cams gabbro, mafics and felsic porphyry intrusions	NNE striking shallow west dipping and ENE striking shallow NW dipping	Sheared quartz veins	silica-sericite-limonite	Quartz-pyrite-chalcopyrite	Main lode	100 m	85 m	8 m
Redeemer Zone 2	Scotty Creek Sandstone / Conglomerate	Sub-vertical N-S shearing (axial planar to Lawlers anticline.)	Subvertical quartz breccia vein and/or tension veins	Arsenopyrite-silicification-quartz	Quartz-silicification-arsenopyrite-	Zone 2 N Core1	1300 m	500 m	1.5 m
Redeemer North	Mafic Conglomerate	Sub-vertical N-S shearing	Biotite, chlorite alteration, along parallel vertical shears	Chlorite, actinolite	Biotite, chlorite, actinolite	RN1 Core 1	400 m	200 m	6 m
Barren Lands	Scotty Creek Sandstone / Siltstone and Conglomerate	Sub-vertical N-S shearing	Subvertical to west-dipping quartz breccia vein	Chlorite	Quartz-carbonate-arsenopyrite ± scheelite ± galena	Main lode	690 m	125 m	1.3 m
450 South	Scotty Creek Sandstone / Ultramafic Conglomerate	Sub-vertical N-S shearing (axial planar to Lawlers anticline. Reverse Sinistral)	West dipping quartz breccia vein and/or tension veins	Sandstone Arsenopyrite-silicification-quartz Ultramafic Conglomerate actinolite-chlorite-talc-pyrite	Sandstone Quartz-silicification-arsenopyrite Ultramafic Conglomerate Quartz-arsenopyrite-pyrite-actinolite-chlorite-talc	HW lode Cross lode	430 m 30 m	160 m 30 m	3 m 14 m

Mineral resource	Host rock	Structure	Lode style	Alteration assemblage		Main domain	Length (m)	Width (m)	Depth (m)
				outer	inner				
Kim	Scotty Creek Sandstone / Ultramafic Conglomerate	Sub-vertical N-S shearing (axial planar to Lawlers anticline. Reverse Sinistral)	West dipping quartz breccia vein and/or tension veins	Sandstone Arsenopyrite-silicification-quartz Ultramafic Conglomerate actinolite-chlorite-talc-pyrite	Sandstone Quartz-silicification-arsenopyrite Ultramafic Conglomerate Quartz-arsenopyrite-pyrite-actinolite-chlorite-talc	Kim lode	1370 m	420 m	1.5 m
FBH	Scotty Creek Sandstone / Ultramafic Conglomerate	Sub-vertical N-S shearing (axial planar to Lawlers anticline. Reverse Sinistral)	West dipping quartz breccia vein and/or tension veins	Sandstone Arsenopyrite-silicification-quartz Ultramafic Conglomerate actinolite-chlorite-talc-pyrite	Sandstone Quartz-silicification-arsenopyrite Ultramafic Conglomerate Quartz-arsenopyrite-pyrite-actinolite-chlorite-talc	Bengal lode	1050 m	160 m	2 m
Kath	Scotty Creek Sandstone / Ultramafic Conglomerate	Sub-vertical N-S shearing (axial planar to Lawlers anticline. Reverse Sinistral)	West dipping quartz breccia vein and/or tension veins	Sandstone Arsenopyrite-silicification-quartz Ultramafic Conglomerate actinolite-chlorite-talc-pyrite	Sandstone Quartz-silicification-arsenopyrite Ultramafic Conglomerate Quartz-arsenopyrite-pyrite-actinolite-chlorite-talc	Kath lode	1650 m	260 m	2.5 m
Waroonga North	Scotty Creek Sandstone / Ultramafic Conglomerate	Sub-vertical N-S shearing (axial planar to Lawlers anticline. Reverse Sinistral)	West dipping quartz breccia vein and/or tension veins	Sandstone Arsenopyrite-silicification-quartz Ultramafic Conglomerate actinolite-chlorite-talc-pyrite	Sandstone Quartz-silicification-arsenopyrite Ultramafic Conglomerate quartz-arsenopyrite-pyrite-actinolite-chlorite-talc	Aurora lode	1150 m	90 m	1.5 m
Main North & South Rajah	Scotty Creek Sandstone / Ultramafic Conglomerate	Sub-vertical N-S shearing (axial planar to Lawlers anticline. Reverse Sinistral)	West dipping quartz breccia vein and/or tension veins	Sandstone Arsenopyrite-silicification-quartz Ultramafic Conglomerate actinolite-chlorite-talc-pyrite	Sandstone quartz-silicification-arsenopyrite Ultramafic Conglomerate Quartz-arsenopyrite-pyrite-actinolite-chlorite-talc	HW lode Rajah	480 m 600 m	500 m 200 m	3 m 1 m
Lower Genesis (LGX)	Scotty Creek Sandstone	NE-SW compression resulting in shallow WSW dipping thrust structure array	Hydrothermal 500 series lode Combination of west dipping quartz breccia/ laminations and Easterly conjugate quartz veins	Halo Silica – arsenopyrite – sericite - pyrite	500 series quartz-albite-rutile Westerly quartz-rutile-arsenopyrite-pyrite ± galena ± sphalerite Easterly quartz ± arsenopyrite	500 series Westerlies Easterlies Sandstone host unit	2300 m 250 m variable / short 900 m	300 m 100 m variable / short 600 m	10 m 5 m variable / short 100 m
Cinderella	Scotty Creek Sandstone / siltstone	Compression resulting in shallow east dipping thrust structure array	Combination of west dipping quartz breccia/ laminations and Easterly conjugate quartz veins	Halo Silica – arsenopyrite – sericite - pyrite	Westerly quartz-rutile-arsenopyrite-pyrite ± galena ± sphalerite Easterly quartz ± arsenopyrite	620832 621410 621430	200 m 400 m 120 m	60 m 100 m 40 m	1 m 0.5 m 2 m
Sheba	Scotty Creek Sandstone / siltstone	NE-SW compression resulting in shallow WSW dipping thrust structure array	Combination of west and east dipping quartz breccia/ laminations and Easterly conjugate quartz veins	Halo Silica – arsenopyrite – sericite - pyrite	Westerly quartz-rutile-arsenopyrite-pyrite ± galena ± sphalerite Easterly quartz ± arsenopyrite± galena ± sphalerite	Sheba South lode Easterlies Sandstone host unit	3000 m variable / short 700 m	100 m variable / short 760 m	0.5 m variable / short 70 m
Upper NH & Upper Genesis	Scotty Creek Sandstone	NE-SW compression resulting in shallow WSW dipping thrust structure array	Combination of west dipping quartz breccia/ laminations and Easterly conjugate quartz veins	Halo Silica – arsenopyrite – sericite - pyrite	Westerly quartz-rutile-arsenopyrite-pyrite ± galena ± sphalerite Easterly quartz ± arsenopyrite	Westerlies Easterlies Sandstone host unit	380 m variable / short 1900 m	60 m variable / short 700 m	1.5 m variable / short 100 m
GE200	Scotty Creek Sandstone	NE-SW compression resulting in shallow WSW dipping thrust structure array	Combination of west dipping quartz breccia/ laminations and Easterly conjugate quartz veins	Halo Silica – arsenopyrite – sericite - pyrite	Westerly quartz-rutile-arsenopyrite-pyrite ± galena ± sphalerite Easterly quartz ± arsenopyrite	200 series	950 m	250 m	3 m
Himitsu	Scotty Creek Sandstone / siltstone	Compression resulting in shallow east dipping thrust structure array	Combination of west dipping quartz breccia/ laminations and Easterly conjugate quartz veins	Halo Silica – arsenopyrite – sericite - pyrite	Westerly quartz-rutile-arsenopyrite-pyrite ± galena ± sphalerite Easterly quartz ± arsenopyrite	Westerlies	450 m	50 m	1 m
Hidden Secret, Glasgow Lass, & Dobra Serica	Scotty Creek Sandstone	Compression resulting in shallow dipping thrust structure array	Combination of west and east dipping conjugate quartz veins	Halo Silica – arsenopyrite – sericite - pyrite	Easterly quartz ± arsenopyrite	Easterlies Sandstone host unit	variable / short 1400 m	variable / short 600 m	variable / short 50 m
Leviathan North	Mt Goodes Basalt and Dolerite/Gabbro	NW-SE striking moderately NE dipping shear zones	Combination of NE dipping quartz veins and overlying sub-horizontal supergene zones		Supergene: silcrete Primary: quartz- arsenopyrite-pyrite	Flat lode	500 m	150 m	4 m

Notes:
a) The dimensions for only the primary domain(s) are shown in the table.
b) All dimensions are approximations, as they vary within the deposits.
c) Easterlies style vein s are small scale veins and highly variable in dimensions.
d) Sandstone unit hosts small scale easterlies style quartz veins and is not continuously mineralized

Source of data: Agnew CPR 2021

The New Holland complex is located between the Waroonga and EMU shears within a locally mineralized zone known as the Glasgow Lass trend, hosted by sedimentary rocks of the Scotty Creek Formation. The sedimentary rocks at this locality strike north-south and dip steeply to the west. Gold mineralisation is largely confined to quartz veins within sandstone and siltstone. Ore zones occur in discrete veins at low angles, dipping predominantly to the east. Higher grade westerly dipping quartz veins are also present in sandstone. The eastern contact of the sandstone is erosional and sharp, resting on siltstone. The western contact is gradational, fining to very fine-grained sand and siltstone.

7 Exploration

7.1 Exploration

Given Agnew is a well-established production stage property with a significant Mineral resource and reserve base, it is not disclosing any exploration targets. Agnew has been owned and operated by Gold Fields for approximately two decades and has a track record over this period of consistent discovery, resource development and reserve generation on an annual basis to replace production depletion and maintain the life of mine. Agnew's strategy of consistent annual investment in brownfield (on-lease or near-mine extensional) exploration to extend mine life is viewed as offering the best route to lower-cost, lower-risk resource and reserve growth in well-understood geological environments. This approach has proved successful and continues to deliver operational flexibility and life extension.

The exploration is configured to deliver a balanced project pipeline that includes identifying early-stage targets with project lead times of typically four to five years, combined with progressing more advanced projects that can potentially deliver new mining opportunities within the next two to three years. Exploration activities are predominantly focused on resource extension to known ore bodies and resource infill drilling to enhance existing resource models and to a lesser degree on initial concept drilling and validation of brownfield targets.

This is achieved by collecting and interpreting foundational datasets and systematically testing the highest probability targets. Foundational datasets include all broad-spaced drilling for geochemistry and geology, high-resolution geophysical surveys, plus detailed interpretation of all datasets. The site strategy and future production requirements are considered as part of the annual and longer-term exploration budget allocation, further ensuring timeous resource and reserve replacement and alignment to strategic plan objectives.

When a potential orebody has been discovered, exploration is extended and intensified in conjunction with comprehensive infill drilling to enable clearer definition of the orebody and its technical and economic characteristics to profile the potential portions to be mined.

Geological, geochemical, geophysical, geostatistical, geotechnical and geometallurgical techniques are constantly refined and modernized to improve effectiveness and the economic viability of prospecting and mining activities.

The regional location of Agnew Gold Mine is shown in Figure 7.1.1 while the individual property boundary and detailed tenement holdings are shown in Figure 3.4.1.

Exploration programmes conducted on the property during the period 1 January 2021 to 31 December 2021 were focused on extending known mineralization at the Waroonga, New Holland and Greater Redeemer complexes (Figure 7.1.1). For the purpose of this report, exploration programmes include regional exploration through to infill programmes to generate an Indicated or Inferred Mineral resource (Resource Definition). Grade control activities including drilling are not considered in this report.

Figure 7.1.1: Agnew Gold Mine location

Source: Agnew CPR, 2021

7.1.1 Geological Setting

Agnew Gold Mine is situated in the northern portion of the Norseman-Wiluna Greenstone Belt of the Yilgarn Craton, Western Australia. Locally the Belt comprises a sequence of mafic to ultramafic volcanics and associated interflow sediments, which have been folded to form the Lawlers Anticline. The Lawlers Anticline plunges in a northerly direction at approximately 30°. The core of the anticline has been intruded by granodiorite, which in turn has been intruded by late stage leucogranite. All gold mineralisation is shear hosted and economic mineralisation commonly extends vertically for in excess of 1km. Refer to Section 6.1 for additional information.

7.1.2 Exploration Programme

Exploration continues to focus on extensions at both the Waroonga and New Holland mineralized systems. The existing mines are supported by on-going exploration and resource definition programmes aimed at extending the life of the current mines and identifying new opportunities/projects in the area. Diamond drilling is the primary exploration activity relevant to this report and the estimation of Mineral resources.

During 2021, Agnew Gold Mine spent US$18.4m (A$24.5m) on Exploration and Resource Definition activities.

The Qualified person's opinion of the 2021 exploration programmes and results is:

a) All procedures and parameters applied to the surveys and investigations are appropriate for the style of mineralisation being prospected

b) The exploration programmes have confirmed continuity of geology and controls on gold mineralisation in key areas

c) There were no material variations encountered during the 2021 exploration programmes

d) Based on the 2021 exploration and results a 2022 exploration budget has been approved to retain traction on the programmes and to progress leading projects

7.2 Drilling

7.2.1 Type and extent

Material exploration drilling during 2021 was focused on extending known mineralisation at the Waroonga, New Holland and Greater Redeemer complexes to support short to medium term expansion of the current mining footprints. Drilling activities beyond these areas were undertaken on early-stage targets to explore for a longer-term pipeline of projects with potential to provide new mining fronts in the future. Agnew is a production stage property and the results from this work are not considered material for the purpose of this report.

The Qualified person's opinion is that a register of individual drill results would be too voluminous, potentially misleading and not relevant to the current reporting of Mineral resources and Mineral reserves.

All drilling is completed by third party contractors under formalized contracts to quality specifications with routine validation and monitoring by Agnew staff. Surface diamond core drilling is generally NQ2 or HQ diameter, while underground diamond core drilling is usually NQ2 core: standard diameter 50.6 mm. (2 inches) or LTK60 diameter. Underground drilling is exclusively diamond core drilling carried out by contractor Barminco, while all surface diamond core drilling is carried out by DDH1 with Strike drilling subcontracted for reverse circulation (RC) percussion and aircore (AC) drilling.

During 2021, 80,517 m of exploration and resource definition drilling was completed, of which 7,539 m was Reverse Circulation (RC), 48,263 m was surface diamond drilling (DD) and 24,715 m was underground diamond drilling (DD). A total of 181,978 samples have been sent to an offsite certified laboratory for analysis, of these 63,409 are from surface drilling and 118,552 are from the UG drilling operations.

In-fill drilling at Waroonga underground further defined the significant Kath Lower lode, which remains open down-plunge. Extensional and in-fill drilling was also completed at the Waroonga North lodes, replacing ore depleted by mining. Down-plunge extensional drilling of the Kim lode continued to return positive results. Step-out and in-fill drilling is planned for the Waroonga North, Kath Lower, Main South, FBH South and Kim South areas.

At New Holland, extensional and exploration drilling was conducted at Hidden Secret, Sheba South and Sheba North (Figure 7.2.2), with minor drilling in the New Holland and Greater Genesis areas. The drilling at Sheba South defined a significant high-grade extension of the Sheba lode. Further drilling at Sheba South, Sheba North and Hidden Secret is planned.

Drilling continued to grow the Redeemer complex mineralized footprint (Figure 7.2.3). At Barren Lands, resource conversion drilling down-plunge of the proposed Barren Lands open pit added to the underground Mineral reserve, which remains open down-plunge. Drilling the Redeemer North lode confirmed the geometry and thickness of the mineralisation, resulting in the reinstatement of Redeemer North as a Mineral resource.

The Redeemer complex is located along the western limb of the Lawlers Anticline within north-east striking, steeply west dipping to slightly overturned greenstone sequences, consisting of mafic and ultramafic volcanics, dolerite and gabbro intrusives, and Mine Corridor Conglomerate (MCC) with mafic to ultramafic clasts. Redeemer Basalt is a mafic sequence located beneath the footwall contact to the MCC, and its formation and position is likely related to a sub-basin low depositional feature. Mineralisation within Redeemer Basalt has a 200 m strike extent and 400 m dip extent. MCC-hosted mineralisation has a 250 m strike extent and 150 m dip extent. The system in general is vertical to steeply west dipping (approximately 80 °). Infill drilling resulted in an estimation with 950 kt at 6.87 g/t for 210 koz Indicated (3.5 g/t cut-off) and 161 kt at 6.46 g/t for 56 koz Inferred (3.5 g/t cut-off).

Exploration planned in 2022 includes Mineral resource conversion drilling at Barren Lands, Redeemer North and Redeemer Zone 2 North, and testing of down-plunge extensions.

Procedures

Drill planning and design is typically completed either in Datamine® or Leapfrog® software packages.

Drill hole collars are set-out pre- drilling by Gold Fields Surveyors. The drill rigs are aligned using either set-up pins, back sights pegs or auto aligners (fibreoptic gyros) mounted onto the first drill rod to ensure accuracy is maintained for the down hole dip and direction. Drill rig supervision is performed by a suitable Gold Fields representative.

Surface drilling is carried out using a SandvikDE880 drill rig mounted on a MAN 8 x 8 truck with a pull back of 68000 Nm and a drilling depth capability of 3200 m. Underground drill rigs used are Epiroc U6 and U8 drill rigs and Boart Longyear LM series, electric-hydraulic diamond drill rigs capable of deep hole and directional drilling mounted on mobile carriers for quicker move times. All drilling contractors have permanent supervision which are in constant contact with geologists on progress and direction of the hole, monitoring depth, orientation, direction and lithological units. An electronic plod and record keeping operating system is used to allow geological and production information to be made immediately available.

Surface collars are surveyed using RTK GPS (Real Tie Kinetic Global Positioning System). Proposed drill holes are initially located by survey. Surface collars are surveyed using differential GPS. Once drilled, all diamond drilling, reverse circulation, aircore and sludge holes have their collar positions located by Agnew surveyors to within ±20 mm accuracy.

Down-hole surveys are completed for all drill holes used in Mineral resource estimates using either a multi-shot camera, Eastman single-shot survey or down-hole gyroscopic surveys.

Due to the relatively shallow depth of the surface aircore and reverse circulation drilling (<200 m) these holes are generally not down hole surveyed since minimal hole deviation is encountered over 200 m. When reverse circulation is used for diamond drill hole pre-collars, these are surveyed using standard down hole methods.

At Waroonga, most mine scale maps and sections are reproduced in the local grid (EMU Grid) which is oriented plus 19° 48' from MGA grid north. This orientation is preferred because it is parallel to the general lithological strike and facilitates simplified map and section making and drill planning.

All New Holland underground mining operations at Agnew Gold Mine, formerly known as Lawlers Gold Mine, are established and coordinated in a local grid commonly known as GLT, or Glasgow Lass Trend.

GLT was originally established by ways of a simple truncation, or shift, from the "Australian Map Grid 1966" which is more commonly known as AMG66. The original truncation is as follows:

- AMG66 Northing – 6,890,000 = GLT Northing
- AMG66 Easting – 260,000 = GLT Easting

Due to the reference between the two grids being a simple truncation there is no grid rotation required, GLT grid North is the same as AMG grid North.

In 1994 AGM66 was revised and replaced with a new grid called the Map Grid of Australia 1994 (MGA94) which is currently the grid in use across Australia has recently been replaced with the Map Grid of Australia 2020 (MGA 2020). The difference between AMG66, and MGA94 and MGA 2020 is still a simple truncation therefore still does not require and grid rotation between the two grid Norths.

All MGA grids are broken into north/south orientated "Zones" across Australia to adjust for curvature of the earth and scaling factors. Agnew Gold Mine and its tenements are located in the western side of Zone 51 (Z51).

Most regional scale maps and sections (i.e. outside of the mine area) will be reproduced utilizing MGA94-Z51 co-ordinates as MGA94 is still current accepted even though MGA2020 is now an active grid.

For the local grids, false heights are added to AHD (Australian Height Datum) as follows:

- GLT = AHD + 1,000 m
- EMU = AHD + 10,000 m

All DD core is processed at one of two core sheds on site. The New holland core shed processes all of the underground core drilled and the EMU core shed processes all of the exploration drilled core.

Diamond core drilling is oriented using an Acer Easy Mark or similar tool to facilitate collection of structural data that aids in geological interpretation. This is completed for exploration and grade control drilling by placing the drill core in a "V" rail such that the orientation marks line up flush against one of the rail edges and the core ends match up. Logging of drilled material is completed on-site by suitable staff.

Standard logging conventions (lithology, alteration, structure and quartz veining) are used to capture information from the drill core. Most of the observations are captured electronically using Toughbooks. Numerous validation steps are built into the acQuire® logging software and all codes are selected from drop down lists. The data is loaded into the mine acQuire® database. Magnetic susceptibility readings are taken every metre from exploration core.

Core loss is also recorded in the database and some loss occurs locally when drilling through fault/shear zones which may be altered or weathered and not very competent. Rock quality designation (RQD) and orientations of structures and contacts are measured after the core is oriented. Density may also be measured and recorded in the database for specified samples. Within the production environment, full core sampling is used and sample pulps are stored on-site. Half and quarter core samples are collected within the exploration space and remaining sections of drill core is stored on-site.

Diamond drill core sample lengths can be variable in a mineralized zone, though usually no longer than 1 m. This enables the capture of assay data for narrow structures and localized grade variations. The core samples are based on geological contacts.

Wet core is digitally photographed and samples taken according to a cut sheet compiled by a geologist. The diamond core drilling core is cut by field assistants. Half or full core samples, usually 1.0 m in length, are bagged in pre-numbered calico bags and submitted for analysis with a sample submission form. The insertion of blanks is under the control of the geologist and certified reference material (standards) are inserted to meet Gold Fields and Agnew protocols per batch.

Diamond drilling typically provides >95 % sample recovery, and where core loss occurs, it must be recorded. reverse circulation sample weights are monitored to indicate core loss and actioned accordingly when needed. Pre-1995 drilling did not utilise core blocks, making estimation of core recovery difficult prior to that time.

Where possible, whole aircore and reverse circulation percussion samples are recovered from the drill rig at 1 m intervals through the cyclone splitter site reducing material to approximately 7 kg to 8 kg. reverse circulation holes are logged and sampled using similar codes to diamond core drilling. Reverse circulation sampling and recovery factors are monitored and actioned accordingly when needed.

Periodic reviews of early drilling assay results and bias are carried out on historical prospects where new drilling is completed. Q-Q Plots of the re-drills and original holes are correlated, and any bias (positive/negative) identified. This is utilized in any future interpretations and modelling. The re-drill and original hole testing may not always be like for like.

The cause of any bias compared with historic data is often due to the comparison being conducted on the entire dataset with no domain or sub-domain separation. Splitting the mineralisation into appropriate geological domains normally allows a true comparison of the samples sourced by the different drilling techniques. This demonstrates that a true representation of the population is being sampled with no clear adverse effects through the sampling method.

The Qualified person's opinion of the 2021 exploration and resource extension drilling is:

(a) All drilling and exploration field activities are supervised to ensure health and safety and maintain appropriate technical standards.

a) The drill hole surveys are adequate by type and length for the intended purpose.

b) Utilising orientated core significantly enhances recorded information to assist with 3-D modelling

c) The drill hole database and subsequent modelling aligns to core recovery losses and should not cause material errors

d) Post QA/QC screening and validation exploration results are incorporated into the estimation of Mineral resources; the categorisation of Mineral resources is described in chapter 11.

e) Validated exploration results are used in the 31 December 2021 Mineral resource estimation.

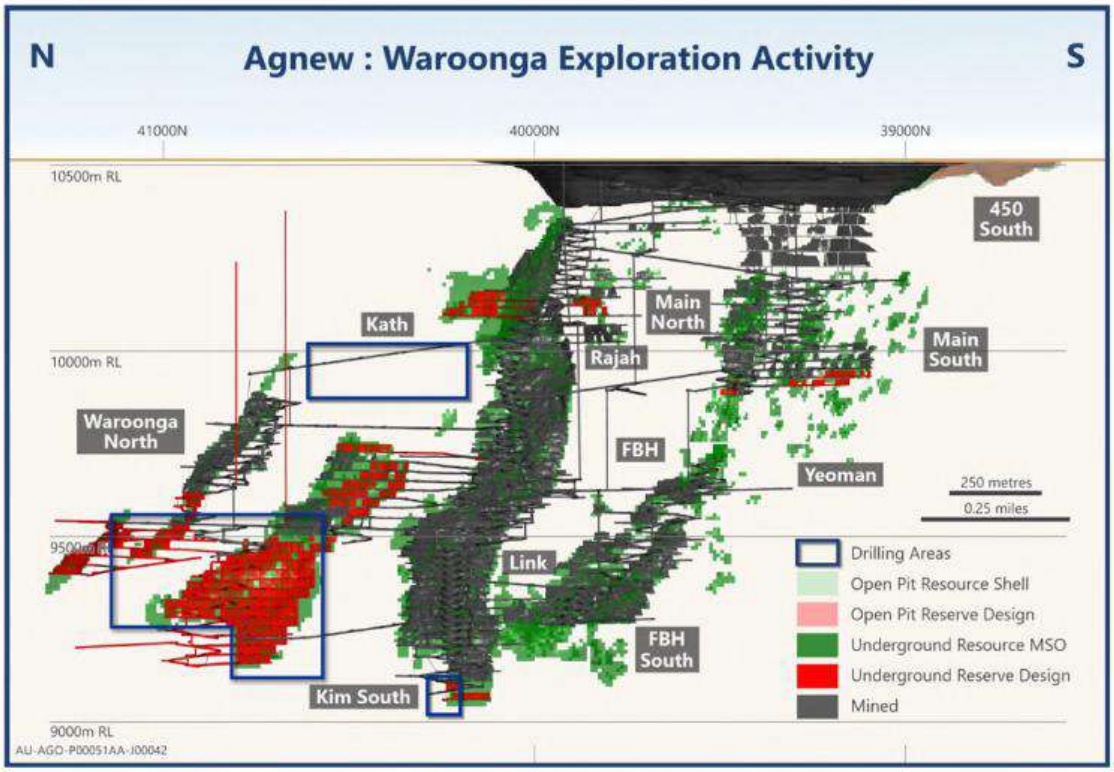
f) Individual exploration drill hole information is not viewed as significant or material to the Mineral resource and Mineral reserve reporting at Agnew and consequently exploration data is not presented

7.2.2 Results

Drilling completed during 2021 was focused on infilling and extending the Waroonga, New Holland and Redeemer complexes. The drill spacing is down to approximately 40 x 40 m and is appropriate to model the geological continuity and derive resource models to the indicated or inferred categories where specified.

At Waroonga, 34,102m of underground diamond drilling was completed in 2021. Infill drilling further defined the significant Kath Lower lode, which remains open down-plunge (Figure 7.2.1). Extensional and infill drilling was also completed at the Waroonga North lodes, replacing ore depleted by mining. Down-plunge extensional drilling of the Kim lode continued to return positive results. Step-out and infill drilling is planned for the Waroonga North, Kath Lower, Main South, FBH South and Kim South areas.

Figure 7.2.1: Schematic long-section through Waroonga complex

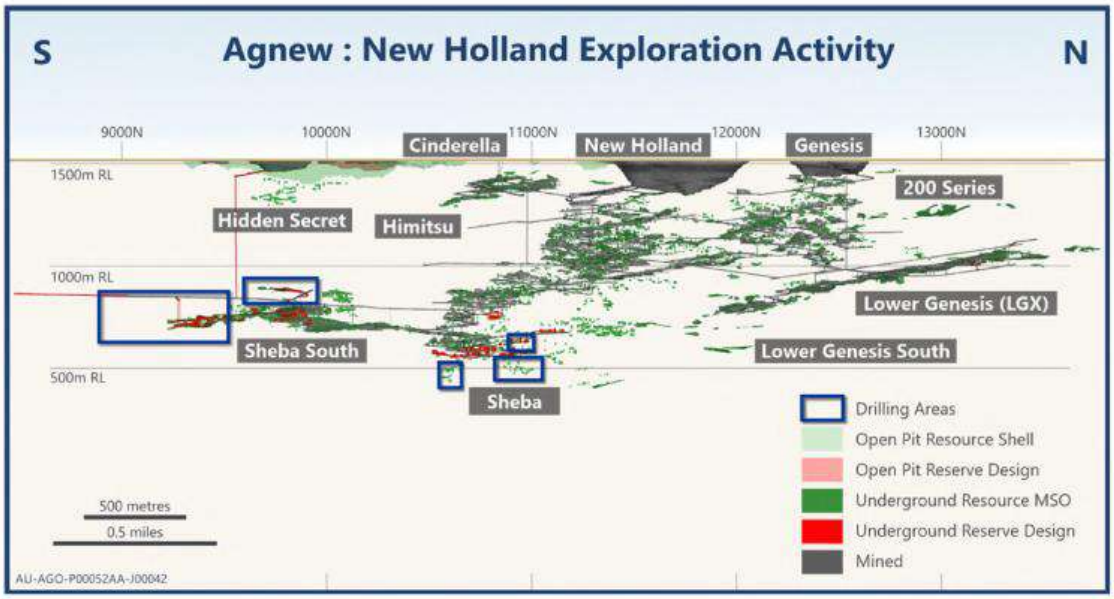


Note: Remnant mineralisation within 10 m of mined stopes above 9800 RL and 7 m below 9800 RL is sterilised and not reported as Resource

Source: Mineral resources and Mineral reserve Supplement to Integrated Annual Report, 2021

At New Holland, 14,702m of extensional and exploration diamond drilling (surface and underground) was conducted, primarily at Hidden Secret, Sheba South and Sheba North (Figure 7.2.2), with minor drilling in the New Holland and Greater Genesis areas. The drilling at Sheba South defined a significant high-grade extension of the Sheba lode which has been used to inform the December 2021 Mineral resource. Further drilling at Sheba South, Sheba North and Hidden Secret is planned in 2022.

Figure 7.2.2: Schematic long-section through New Holland complex

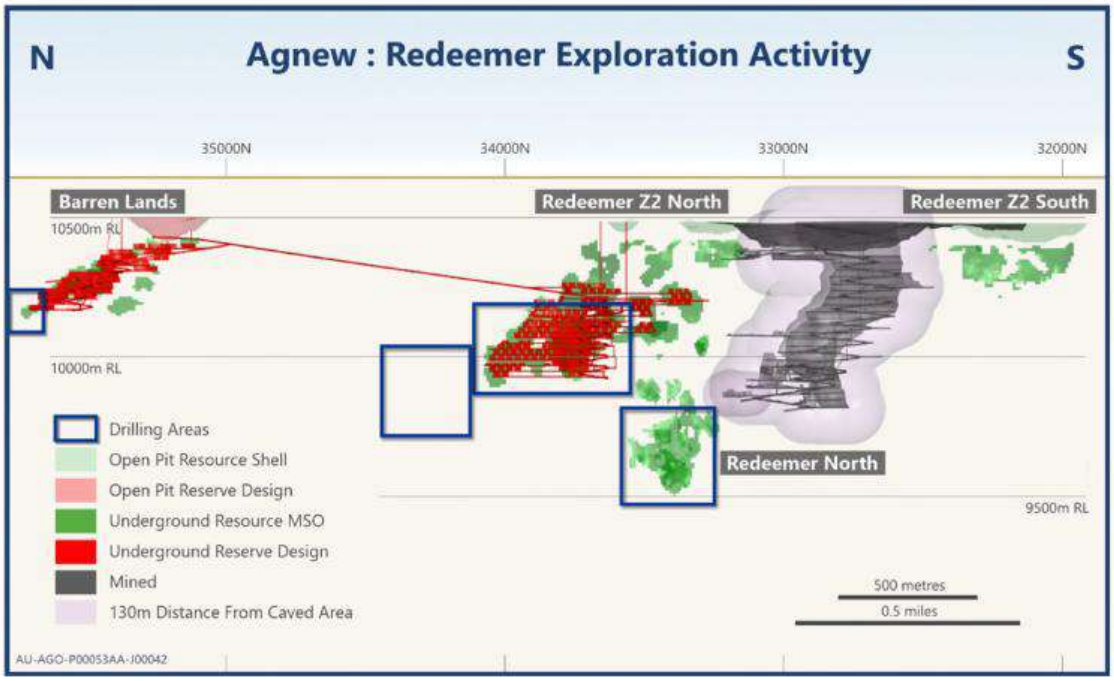


Note: Remnant mineralisation with 7 m of mined stopes is sterilised and not reported as Resource

Source: Mineral resources and Mineral reserve Supplement to Integrated Annual Report, 2021

At the Redeemer complex which includes Barren Lands, 27,175m of surface drilling was completed in 2021. Drilling included both reverse circulation (RC) and diamond drilling (DD). Barren Lands, resource conversion drilling down-plunge of the proposed Barren Lands open pit added to the underground Mineral reserve, which remains open down-plunge (Figure 7.2.3). Drilling the Redeemer North lode confirmed the geometry and thickness of the mineralisation, resulting in the reinstatement of Redeemer North as a Mineral resource.

Figure 7.2.3: Schematic long-section through Redeemer complex



Note: Mineralisation with 130 m of the caved area is sterilised and not reported as Resource

Source: Mineral resources and Mineral reserve Supplement to Integrated Annual Report, 2021

Future exploration includes extensional drilling of Barren Lands, Redeemer North and Redeemer Zone 2 North, and testing of down-plunge extensions in all areas.

The Qualified person's opinion of the 2021 exploration and resource extension drilling is:

(a) All exploration activities, including drilling, database management, validation and QA/QC, prior to incorporating relevant data into the resource modelling and estimation process, is viewed as sufficient, appropriate, technically assured and suitable to support Mineral resource estimates.

7.3 Hydrogeology

Two significant aquifer systems are identified in the Agnew area.

- Vuggy, siliceous ultramafic aquifers developed through preferential secondary weathering of specific underlying ultramafic rocks (dunnite). Recharge to the aquifers is low and water is being removed (mined) from storage with expected high rates of abstraction (water drawn from bores). The Fairyland, EMU and New Woman borefields are developed in the siliceous ultramafic aquifer and are the principal sources of potable and process water.
- Fractured rock aquifers are associated with structural features such as faults, joints and shear zones, particularly in metasediments. These deep fractured rock aquifers are typical in the mines that require dewatering; the limits of which are not well defined. The deeper fractured rock aquifers appear to have little or no hydraulic connection to the overlying/adjacent silicified ultramafic aquifers.

Regional groundwater surveys followed by mine-scale airlift, pumping & packer testing have established initial hydrogeological parameters, and the initial hydrogeological database and model.

Pre-feasibility and Feasibility studies include targeted pumping and airlift testing, piezometer installation, enhancement of the hydrogeological database and 3D modelling, and initial assessment of depressurization and dewatering requirements.

The Qualified persons opinion of the 2021 hydrology is:

(a) Agnew has reliance on appropriate hydrological studies conducted at all relevant sites

a) Hydrology is not viewed as presenting a material risk to Agnew or the December 2021 Mineral resource and Mineral reserve estimates.

7.4 Geotechnical

A representative selection of uncut resource diamond drilling core (normally/preferably HQ size) is geotechnically logged and sampled for laboratory testing (Table 7.4.1). In addition, targeted, dedicated triple-tube geotechnical holes are required for any study and are planned by the responsible geotechnical department.

Agnew guidelines for open pit studies are a minimum of one drill hole per 100 m of pit crest, or one drill hole pierce point per 4 ha of pit slope surface. Entire recovered orientated core is logged to determine representative rock mass.

Guidelines for underground projects is a pierce-point density of 50 m x 50 m for non-orientated rock mass logging and 100 m x 100 m for oriented logging. The tested area is normally 100 m either side of the ore. Mine infrastructure is normally within the 100 m window. Additional testing is completed for infrastructure outside the tested area.

Table 7.4.1: Representative samples for laboratory testing

Type of test	Samples	Underground	Open pit
Direct shear (DST) (for weathered rock, saprolite, fault gouge, etc.)	5 per domain	☒	☑
Uniaxial compressive strength (UCS) (with Youngs Modulus and Poisson's ratio determination)	5 per lithology	☑	☑
Triaxial compressive tests (GCTS) (5 suites at four confining pressures)	20 per lithology	☑	☑
Brazilian tensile strength (UTS)	5 per lithology	☑	☒
Acoustic emission (AE)	3 per site	☑	☒

Source of data; Agnew CPR 2021

Where insufficient core logging data is available, line or cell mapping is conducted on surface or underground exposures

The Qualified person's opinion of the 2021 geotechnical work is:

(a) Agnew has completed all appropriate testing for the current life of mine reserve and continues to test all new significant discoveries

(b) Geotechnical domains and lithologies are based on core logging and modelled by the Geology department

(c) Sample testing is adequate for the purposes of this report

(d) The quality of the sampling and laboratory testing is adequate to support the Mineral resource and Mineral reserve estimates.

All rock testing for Agnew is conducted at Nata accredited laboratories. Samples provided to the laboratories are intact samples collected directly from core which exceed the minimum length requirements and rock sample condition requirements for the various tests (DST, UCS of BTS) conducted. Each sample is protectively wrapped for transport and has all associated domain logging validated prior to use of the test results in a corresponding study or analysis.

Due to varying levels of alteration and weathering within Agnew Gold Mine lithologies, the typical strength ranges from 25 MPa to 260 MPa based on UCS and UTS testing, 1.1 MPa to 31.7 MPa for BTS testing and 30 ° to 38 ° for DST (open pit only) testing. These rockmass characteristics are well understood and there are proven Geotechnical Engineering solutions in terms of ground support underground and pit slope parameters in open pit for each rock type and associated ground conditions. The principal stress is horizontal.

7.5 Density

Bulk density measurements are routinely completed by experienced Agnew core farm staff utilizing the water displacement method for competent non-porous rocks. The sample is air-dried and weighed to determine the dry mass (M_s). The sample is placed in a basket and weighed in water. The weight of the basket in water is subtracted to determine the weight of the sample in water ($M_{s\ in\ water}$). Dry bulk density is calculated as the mass of the sample in air divided by the difference between the mass of the sample in air and the mass of the sample in water. Oxide samples are submitted to Australian Laboratory Services (ALS) Kalgoorlie for density determination using the water displacement method after wax coating.

The bulk density values by Mineral resource area are summarized in Table 7.5.1.

Table 7.5.1: Key Resource models, lithology and bulk density values

Resource model	Lithology	Density (t/m³)
Claudius	Cover	1.93
	Duricrust	2.06
	Saprolite Footwall basalt, Volcanic sediments, Hangingwall basalt	2.24
	Saprolite Ultramafic	2.23
	Saprolite Scotty Creek Sediments	2.55
	Saprock Footwall basalt, Volcanic sediments, Hangingwall basalt	2.99
	Saprock Ultramafic	2.74
	Saprock Scotty Creek Sediments	2.55
	Fresh Footwall basalt, Volcanic sediments, Hangingwall basalt	3.03
	Fresh Ultramafic	2.87
	Fresh Scotty Creek Sediments	2.67
Maria	Cover/transported	2.00
	Oxide conglomerate	1.70
	Transitional conglomerate	2.59
	Fresh conglomerate	2.81
Redeemer Zone 2 & Redeemer North	Laterite / Duricrust	2.18
	Silcrete / Calcrete	2.37
	Upper Saprolite	1.81
	Lower Saprolite	2.40
	Saprock	2.65
	Fresh Never Can Tell (NCT) Basalt	3.01
	Fresh Mafics	3.01
	Fresh Mine Corridor Conglomerate (MCC)	2.99
	Fresh Porphyry	2.75
	Fresh Zone 1 pebbly sandstone	2.71
	Fresh Zone 2 pebbly sandstone	2.72
	Fresh Zone 3 pebbly sandstone	2.75
	Fresh Zone 2a pebbly sandstone	2.72
	Fresh Scotty Creek Sediments	2.73
	Fresh Ultramafic	2.90
Cams	Oxide basalt/gabbro	2.20
	Fresh basalt/gabbro	2.80
450 South	Saprolite MCC	1.90
	Saprock MCC	2.40
	Fresh MCC	2.80
Kim	Fresh MCC	2.80
FBH	Fresh Scotty Creek sediments	2.81
	Fresh MCC - SKcU3 – halo and non-mineralised	2.92
	Fresh MCC - SKcU3 – mineralised	2.82
	Fresh Edmunds Sandstone – halo and non-mineralised	2.88
	Fresh Edmunds Sandstone – mineralised	2.82
	Fresh MCC - SKcU2– halo and non-mineralised	2.90
	Fresh MCC - SKcU2 – mineralised	2.76
	Fresh MCC - SKcU1	2.95
	Fresh Ultramafic	2.94

Resource model	Lithology	Density (t/m³)
	Fresh Porphyry	2.82
Kath & Waroonga North	Transported / Duricrust	1.66
	Upper Saprolite	1.71
	Lower Saprolite	2.37
	Saprock	2.54
	Fresh Scotty Creek	2.80
	Fresh MCC - SkcU3	2.92
	Fresh Edmunds Sandstone	2.89
	Fresh MCC - SkcU2	2.89
	Fresh MCC - SkcU1	2.96
	Fresh Ultramafic	2.97
	Fresh Porphyry (none)	2.66
	Fresh Siliceous sandstone	2.97
	Fresh Mineralised lodes excluding easterlies	2.73
	Fresh Mineralised lodes easterlies	2.79
	Fresh Halo	2.86
Main North Main South Rajah	Fresh MCC	2.80
Lower Genesis (LGX)	Fresh Scotty Creek sediments	2.70
Cinderella	Saprolite Scotty Creek sediments	1.70
	Saprock Scotty Creek sediments	2.60
	Fresh Scotty Creek sediments	2.64
Sheba	Fresh Scotty Creek Mudstone	2.73
	Fresh Scotty Creek Medium/fine grained sandstone interbedded west	2.72
	Fresh Scotty Creek Western coarse-grained sandstone	2.67
	Fresh Scotty Creek Medium/fine grained sandstone interbedded central	2.69
	Fresh Scotty Creek Eastern coarse-grained sandstone	2.68
	Fresh Scotty Creek Medium/fine grained sandstone interbedded east	2.69
Upper NH & Upper Genesis	Fresh Scotty Creek sandstone	2.70
GE200	Fresh Scotty Creek sandstone	2.70
Hidden Secret, Glasgow Lass, Dobra Serica & Himitsu	Duricrust	1.66
	Upper saprolite Scotty Creek sediments	1.71
	Lower saprolite Scotty Creek sediments	2.37
	Saprock Scotty Creek sediments	2.54
	Fresh Scotty Creek sandstone	2.69
Leviathan North	Duricrust	2.06
	Upper saprolite basalt/dolerite	1.78
	Lower saprolite basalt/dolerite	1.94
	Saprock basalt/dolerite	2.51
	Fresh basalt/dolerite	2.88
	Silcrete	2.37
Barren Lands	Cover/Duricrust	2.14
	Upper saprolite - MCC, NCT basalt & Ultramafic Cumulate	1.74
	Upper saprolite - Sandstone	1.84
	Upper saprolite - Zone1 to Zone3 pebbly sandstone	1.74
	Lower saprolite - MCC	2.21
	Lower saprolite - NCT basalt	2.24
	Lower saprolite - Ultramafic Cumulate	2.23
	Lower saprolite - Sandstone	2.26
	Lower saprolite - Zone1 to Zone4 pebbly sandstone	2.21
	Lower saprolite - Mafic dykes	2.24
	Saprock - MCC	2.56
	Saprock - NCT basalt	2.99
	Saprock - Ultramafic Cumulate	2.74
	Saprock - Sandstone	2.52
	Saprock - Zone1 to Zone4 pebbly sandstone	2.63
	Saprock - Mafic dykes	2.99
	Fresh - MCC	2.96
	Fresh - NCT basalt	3.03
	Fresh - Ultramafic Cumulate	2.92

Resource model	Lithology	Density (t/m³)
	Fresh - Redeemer basalt	2.96
	Fresh - Sandstone	2.74
	Fresh - Zone1 to Zone4 pebbly sandstone	2.72
	Fresh - Mafic dyke 1	2.94
	Fresh - Mafic dyke 2	3.04
	Silcrete lower	2.37
	Silcrete upper	2.37

Source of data; Agnew CPR 2021

The Qualified person's opinion of the density work is:

(a) The bulk density testing is adequate for the intended purpose and the tonnage estimation based on the bulk densities appear to have little bias

b) Bulk densities are consistent with lithology and ore types estimated over a ±25-year mining history

8 Sample preparation, analyses, and security

8.1 Sample preparation

Sample types taken at Agnew include:

- Diamond core drilling: samples are marked up with a maximum core length of 1 m, depending on the core size. Where possible the core is cut in half with one half submitted for analysis. Core is whole sampled if it cannot be cut (e.g. underground resource definition and grade control holes).
- Reverse circulation: the whole sample is recovered through a cyclone attached to the drill rig and reduced to around 3 kg using a Metzke fixed cone splitter. A split duplicate sample is also collected for comparison. Samples are recorded as 'dry', 'damp' or 'wet'. Where the drill operator is unable to lift the air from the hole in order to keep the sample dry for approximately 4 to 6 m, the hole is ended.
- Aircore: the whole sample is recovered through a cyclone attached to the drill rig and reduced using a Metzke fixed cone splitter. A split duplicate sample is also collected. In wet horizons, the total sample is collected and manually sub-sampled utilizing the fractional scooping technique. Most of this work is completed at the laboratory where the sample is dried, homogenised, split and analyzed. Wet sample cyclone preparation causes a high sample duplicate bias, whereas adapting to the fractional scooping technique improves duplicate sample bias in wet sample preparation.

Each hole drilled is assigned a unique hole identification number and is uploaded to the database with all appropriate associated metadata (e.g., spatial location, hole type, depth etc). Each sample collected is issued with a unique sample number along with a depth interval. The recoveries and collection dates are recorded against each of the samples.

A series of written standard procedures exist for sampling and core cutting at Agnew. Periodic routine visits to drill rigs and the core farm are carried out by project geologists and senior geologists/superintendents to review core logging and sampling practices. These are also supported by quarterly routine Sarbanes-Oxley (SOX) control procedure walkthroughs and reviews.

All recent diamond drill core is retained in the core farm and reverse circulation and aircore chips are stored in labelled compartment trays for future reference.

For samples processed at the assay laboratory:

- A 250 to 300 gram pulp residue (fire-assay) or 450 to 500 gram jar (Photon Assay) is held for up to three months then returned to Agnew.
- Bulk residues are retained for three months then returned to site or discarded depending on project requirements.

Security is not a significant issue at Agnew as it is a remote site and the number of outside visitors is low. A security gate and swipe card system exists to account for all mine personnel and numerous security video cameras placed around the site. Deposits known to contain visible gold renders the drill core susceptible to theft, however, the risk of sample tampering is considered low.

Agnew organizes transport companies to collect bagged samples from a secured locality at the Property. These are then transported to the laboratory facility for further preparation and assaying.

All samples received by the laboratory are physically checked against the dispatch order and Agnew is notified of any discrepancies prior to sample preparation commencing. No Company personnel are involved in the preparation or analysis process.

The Qualified person has reviewed the sample preparation and security procedures. The sample preparation is found to be adequate with effective supervision and in line with industry leading standards. No material bias is indicated that could potentially impact the sampling preparation and analysis. Sample security enforcement is reliable with low consequence if in the unlikely event of security protocols failure.

8.2 Sample analysis

In 2021 Agnew changed from using the traditional fire-assay analysis method for gold to the PhotonAassay analysis method. The PhotonAssay method involves exposure of samples with high energy X-rays causing excitation of atomic nuclei with resulting production and decay of a gold isomer. Gamma rays emitted from the isomer decay are detected and the atoms of gold in the sample can be counted. PhotonAssay is highly accurate, chemical-free and completely non-destructive of the sample. A 450 – 500 g single-use jar allows for bulk analysis with no chance of cross contamination between sample.

The Agnew gold deposits are structurally controlled, vein-hosted hydrothermal ore deposits containing coarse gold. Obtaining representative samples from a coarse gold deposit is challenging, and sampling theory suggests larger samples be taken to achieve this. Traditional fire-assay requires sub-sampling via crushing and splitting to obtain a 50 g sub-sample for analysis. PhotonAssay provides a practical solution to rapidly obtain an accurate gold assay using a significantly larger sample size of up to 500 g (approximately, density dependent). The larger sample mass reduces sampling errors and improves precision. Additional benefits are simpler sample preparation, faster assay turnaround and the ability to carry out repeat analysis as the sample is not destroyed by the process.

Primary assaying of diamond core drilling, reverse circulation and aircore samples is undertaken by MinAnalytical (MinA) Kalgoorlie (PhotonAssay) and Australian Laboratory Services (ALS) Kalgoorlie and Perth (fire-assay). Fire assay is the assaying technique which is industry standard process for obtaining gold concentrations from samples.

The majority of grade control, resource definition and exploration samples collected at Agnew in 2021 were analyzed using PhotonAssay (66 %), with samples submitted for fire-assay (30 %), and multielement analysis (4 %).

Table 8.2.1: Analytical laboratory accreditation Analytical laboratory accreditation

Laboratory	Certificate number Accreditation number
MinAnalytical (MinA) Kalgoorlie	18876 ,21075 (ISO/IEC 17025)
Australian Laboratory Services (ALS) Kalgoorlie	QEC27912, C-90494 (ISO 9001:2015)
Australian Laboratory Services (ALS) Perth	825, 23001 (ISO/IEC 17025)

The Qualified person has reviewed the certificates and is of the opinion that the analytical laboratories are certificated and have effective process and protocol in place to ensure quality control and assurance and minimize any material errors.

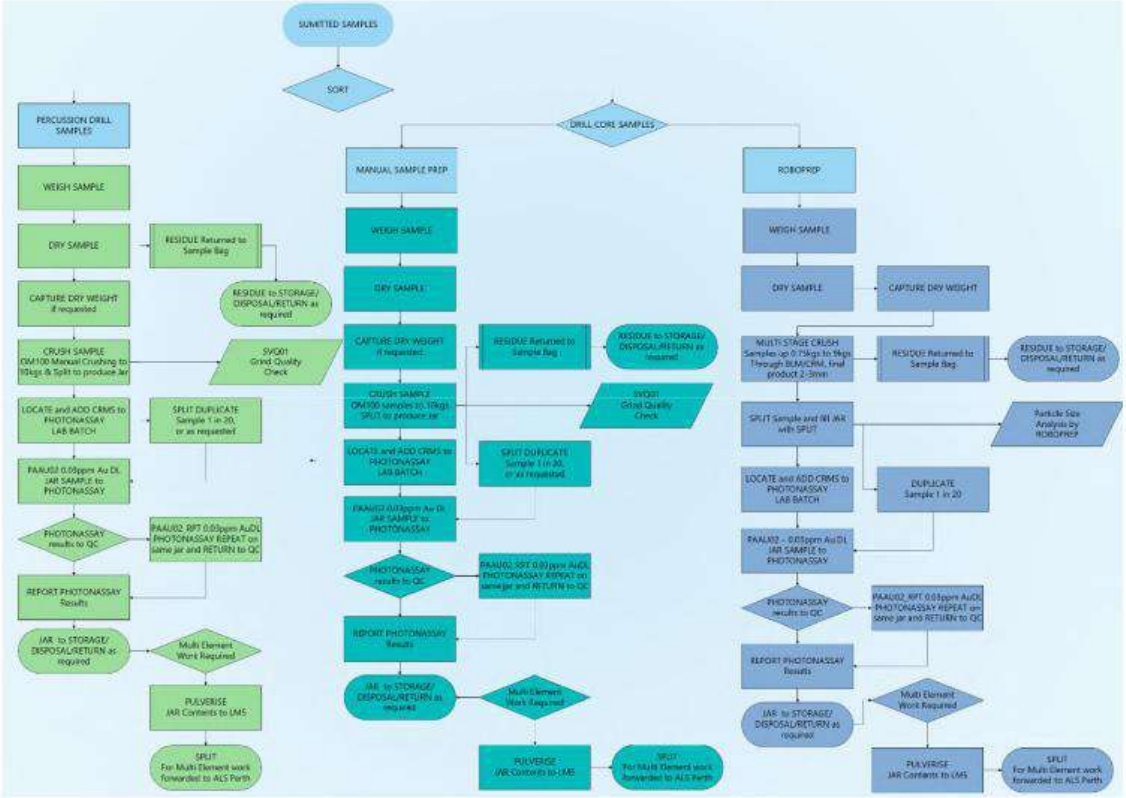
8.2.1 PhotonAssay

Samples transported to MinA Kalgoorlie for PhotonAssay undergo crushing and sub-sampling through the MinA automated sample preparation facility or manual sample preparation. This comprises a single stage coarse and fine crush using a Boyd crusher to 2-3 mm. Approximately 450-500 g sub-sample is obtained via a riffle splitter and deposited into a PhotonAssay jar. The jars are passed through the automated PA1408X ('MAX') system for analysis.

The standard PhotonAssay setting within the MAX system has a gold detection limit of 0.03 ppm – 350 ppm. Samples that exceed > 350 ppm trigger a re-assay at a higher energy setting for which the system is recalibrated and samples re-assayed at the end of shift.

Rejects are retained at the lab for 3 months, then returned to site, these are discarded or retained depending on the project requirements.

Figure 8.2.1: Sample flowchart for MinAnalytical



Source: Agnew CPR 2021

8.2.2 Fire-assay

Following arrival in Kalgoorlie or Perth and checking against the accompanying documentation, the samples are sorted, weighed and sample numbers entered into the Laboratory Information Management System (LIMS). Bar-coded sample labels and work sheets are used to control workflow through the sample preparation and analytical phases.

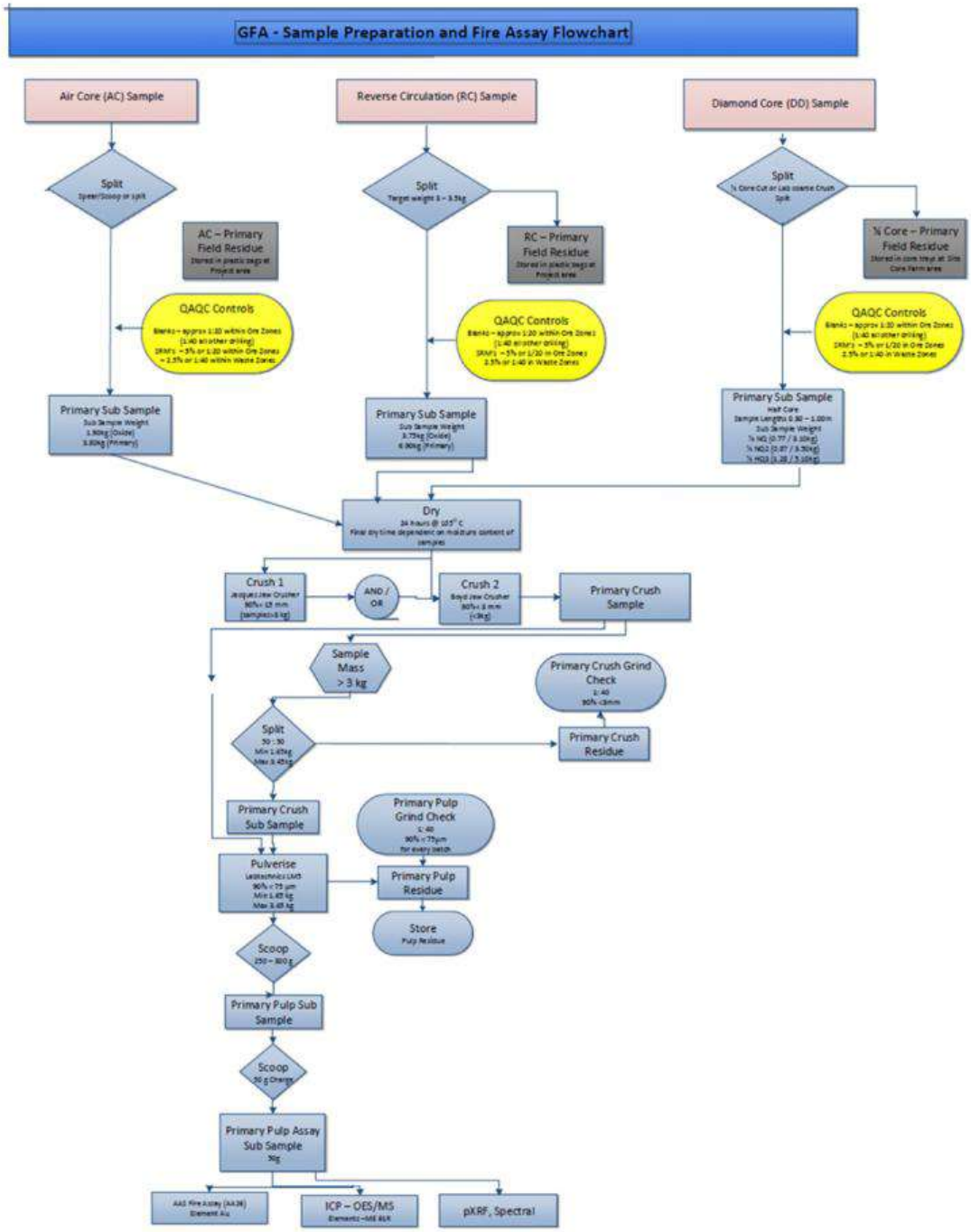
The samples in their respective calico bags are dried at 105 ºC in a gas forced oven followed by:

- Jaw crushing of drill core to -15 mm.
- Boyd crusher to 90 % pass <3 mm.
- Riffle split to <3 kg and pulverizing in a LM5 mill.
- 250 – 300 g pulp sub-sample taken for analysis.
- Remainder of pulp returned to original calico sample bag.

The pulverized sub-sample is placed in a labelled paper sample bag for analysis.

Analysis is by 50 g fire-assay with an atomic absorption spectrometry (AAS) finish. Gold assay values of >60 g/t Au undergo gravimetric analysis.

Figure 8.2.2: Sample flowchart for ALS



Source: Agnew CPR 2021

All laboratories processing Agnew samples are required to have separate sample preparation and analysis circuits for mine grade control samples and exploration samples to minimize cross contamination.

The pulps are packaged in water resistant sample bags clearly marked with the sample number and Agnew number (and barcode if available). Sample envelopes are securely packaged in stackable boxes. Given the occurrence of some

high grades, screen fire assays checks are undertaken, but this occurs for <1 % of the samples. The laboratories used are listed in Table 8.2.1.

8.3 Quality control and quality assurance (QA/QC)

To monitor QA/QC, Agnew has implemented a comprehensive "Best Practice" QC system, comprising written procedures and monitoring by geology group, together with internal and external audits. The QA/QC procedures, audits, round-robin benchmarking, as well as the submission of blanks and standards are specified, and full documentation is kept on site at Agnew.

QC samples are submitted within laboratory batches allowing monitoring of the drilling, sampling, laboratory sample preparation techniques as well as analytical accuracy and precision. The different types of QC samples are summarized in Table 8.3.1.

Table 8.3.1: Quality control sample types

Sample description	QC stage	Comments
Field duplicate	Monitors sample source and sampling procedure	Duplicate sample taken identically as the original sample (half core; reverse circulation duplicate split taken in field)
Laboratory duplicate	Preparation	Repeats taken by ALS to monitor the laboratory process
Coarse crush duplicate	Preparation after jaw crush, but before pulverized	Implemented in 2019 to ensure that whole diamond core samples can get a representative duplicate
Standard/blank	Analytical	Certified sample of known concentration: pulps (standards), coarse crushed matrix-matched basalt (blank)
Pulp re-assay	Analytical	Repeated re-assay on the analytical pulp as requested by the QA/QC geologist from a QC failure or as a lab check
Pulp umpire	Analytical (at the end of a programme)	Random subset of pulps sent to an umpire laboratory to ensure analytical accuracy and precision

Source: Agnew CPR, 2021

Blanks and field duplicate samples are inserted at an average frequency of 1 in 20. Low-grade, medium-grade and high-grade certified reference materials (standards) are inserted at relevant locations within intersections at a minimum frequency of 1 in 20. All sampling and quality management is supervised by the geologist responsible for the drilling programme and may supplement the QA/QC sampling as required.

Quartz washes (barren material) are also inserted between extremely high-grade areas to prevent any carry over from the laboratory sample preparation procedure.

For diamond core drilling, field duplicates were previously taken by cutting the retained half core into quarter core. This practice was replaced by a crush duplicate of the primary half core sample. Crush duplicates and pulp duplicates are taken from the original sample and re-assayed by the primary laboratory. The rate of insertion for crush and pulp duplicates is 1 in 20.

ALS and MinA routinely run a minimum of one blank and three standards with each sample batch. These results and long-term results are available at any time on request.

Each laboratory batch is analysed on receipt to determine accuracy, precision and repeatability of each assay. All assay results are received directly from the laboratory and automatically loaded into the database using scheduled automated database tasks. The results are subjected to an automated process where the QA/QC samples are evaluated and either passed or failed. A digital certified assay certificate is backed up on the Agnew server on a regular schedule.

Assay results outside a standard set of control guidelines are flagged automatically and a warning notification is sent to the responsible geologist. If a batch fails, it is quarantined in the database until the geologist has examined the data and determined any course of action required in conjunction with the geology group. Data analyzed includes sample size (weight) and, standard and blank performance, with monthly summaries presented to the geology staff.

Periodic QA/QC reports evaluates all assay data received and reports on the accuracy, precision and overall quality of the data. Additional reports are prepared by the project geologist for individual projects.

All geologists receive training in QA/QC and the use of acQuire® to evaluate data. The geologists are expected to actively monitor and maintain the quality of the data they are producing. Agnew provides the geologist with the minimum frequency of QC samples to be inserted into sampling programmes via macros in the sample registers. QC data is monitored continuously by senior geologists and by the project geologist during drilling, with the senior geologists and/or regional database group provided a summary report of the data on a periodic basis.

Data collection and storage is subject to internal system and staff-based audits, SOX controls and audits, round robin laboratory analysis and QA/QC reference material usage.

No systematic long term sample biases have been identified from the QA/QC programme for the drilling carried out at Agnew which demonstrates sufficient accuracy and precision for use in the estimating of Mineral resources.

Secondary check assay analysis (umpire sampling) was recently carried out for 82 samples for fire-assays. Pulverized duplicate samples were submitted to an umpire laboratory (Genalysis) for secondary quality analysis. No systematic sample bias is identified from the QA/QC programme. Umpire checks have not yet commenced for PhotonAssays.

9 Data verification

The execution of mine and regional exploration programmes is completed to industry best practice and is aligned with numerous standards and procedures developed by Agnew and Gold Fields over many years. The process consists of procedures, audits and sign-off documents for all key elements that input into the generation of a Mineral resource model to ensure full compliance. The key components of the geological data acquisition framework include:

- Validity – Controls to ensure the validity of key activities.
- Accuracy – Controls to establish the accuracy of data inputs and outputs.
- Completeness – Controls to ensure the completeness of the process followed.
- Timing – Preventative and detective controls to identify potential risk and deviation of quality.
- Segregation of Duties/Sign-off – Key members of the senior team are responsible for different aspects of the process.

Describe data verification procedures including:

- Any limitations on or failure to conduct such verification, and the reasons for any such limitations or failure; and
- The Qualified person's opinion on the adequacy of the data for the purposes used in the technical report summary

The Qualified person is of the opinion that the data verification process and protocols are adequate to minimize any material errors, are in line with industry leading standards and underpin technical assurance.

9.1 Data management

All data at Agnew is stored in a Sequel database (SQL) relational database format using a proprietary front-end software interface (acQuire®), which enables definition of tasks, permission management and database integrity. The Sequel database is configured for optimal validation through constraints, library tables, triggers and stored procedures. Data that fails the import rules are rejected or stored in buffer tables until corrected. This meets industry best practice and SOX requirements.

The database is located on a dedicated server under the control of Gold Fields Australia Information Technology Department. Security and disaster recovery protocols are in place and follow corporate guidelines under the direction of the Information Technology Department. Daily server backups of the acQuire® database are also carried out.

A major initiative in 2016 was a systematic merge of multiple historical and off-site databases into a single validated and consistent site database. This work was managed by the centralized database team and utilized external database specialists to validate, review, error check and ultimately merge all ancillary databases into the main standardized acQuire® site database with standardized lithological codes. This was completed in December 2016 with on-going validation and reviews to ensure overall data integrity.

While some customization of the various databases has occurred since acQuire® was adopted, a common structure and set of tools is now maintained and periodically updated when required by the geological database team to ensure standardization, data integrity and adaptation for new geological inputs and data (e.g., hyperspectral data which is now routinely added).

All exploration data control is managed centrally, from drill hole planning to final assay, survey and geological capture. Most logging data (lithology, alteration, and structural characteristics of core and percussion chips) is captured directly either by manual or to customized digital logging tools with stringent validation and data entry constraints. Geologists load data via buffer tables where initial validation of the data occurs. The data are uploaded into the database by the geologist after which an additional automated validation process is conducted on the data and the geologist is notified of any issue. The issue must be addressed, or the data is not loaded into the database.

Data validation is controlled via rules, library tables, triggers and stored procedures. A validation extension in acQuire® runs queries against the database, which includes checks for incorrect collar locations and overlapping, missing or incorrect down-hole surveys. Procedures and templates are available for all geological data.

Verification of data contained in this database lies principally with the geologist who logged the drill holes, and with the mine and project geologists who confirm assay and survey entries to source certificates and validate the data entered into the database. The logger has the responsibility to examine final output and investigate and explain any non-compliances. Visual validation on screen and on paper sections and plans is also routinely done prior to declaring the drill hole validated.

Confirmation is required that all data imported into the database was validated by the database administrator and the programme geologists. Confirmation is also required that validation of all data occurred prior to being imported into the final database tables. Only accepted results are used in resource estimation. Any primary results failing the QA/QC standards are rejected, re-assayed and re-imported for the programme geologist to approve.

Limited data is used from non-Agnew sources. Where this data is used it is acknowledged and identified in the appropriate reports. Standard practice is to convert such data to Agnew standards and import into the database upon data validation and checks.

The Qualified person's opinion of the data management is:

(a) The data management process and protocols are adequate to minimize any material errors.

a) Regular validation of the database and data management process is aligned with standard industry practices, verified to GFA SOX measure quarterly as a minimum

9.2 Plant Sampling

Daily composite samples of process plant feed and tailings streams are taken to assist with on-site gold accounting and reconciliation. These samples are collected using a combination of automatic sampling stations as well as manual cuts using appropriately designed samplers. The analysis of the samples used for accounting purposes is conducted by ALS at its Kalgoorlie laboratory.

Solid sample composites are analyzed using fire assay with an AAS finish. Carbon sample composites are analyzed using high temperature ashing, acid digest and an AAS finish. Solution sample composites are analyzed using DIBK extraction and an AAS finish. All laboratory assaying procedures are aligned with standard industry practices.

In accordance with Gold Fields Plant Metal Accounting Standard, a gold in circuit survey is undertaken monthly to reconcile (by mass balance) the back-calculated gold grade of the mill feed with the mill feed grade estimates obtained using plant samples and assays. The monthly variance between the assayed grade and the back-calculated grade is monitored, and an investigation is required to be carried out if this variance exceeds the minimum allowable levels outlined in the Gold Fields Plant Metal Accounting Standard.

9.3 Drilling

Drillhole data validation is completed using Datamine® or Leapfrog® software including checks for unique collar locations, overlapping intervals, excessive down hole deviation, and matching total drill depth within all tables. Errors are reviewed and either corrected or the hole is flagged and excluded from use in the estimation. All issues identified are corrected in the acQuire®database.

Where multiple drilling techniques are used in a resource estimate (DD and RC), a comparison of the data within a common volume is carried out. If potential biases are noted, these are investigated to establish potential reasons and actions. Where drilling data is historic, available QAQC data is assessed. Where historic drilling data lacks QAQC, a comparison of recent and historic drilling may be made to assess data quality and suitability for use. A decision may be made to include or exclude the poorer quality data and to apply an appropriate resource classification.

In the case where the quality of historic drilling is in doubt, further drilling may be carried out to twin drillholes and gather QAQC data.

Where underground face samples are used in resource estimates these are routinely compared to DD within a common volume and lode. The face data for some deposits displays biases compared with DD. Reasons considered for the bias may be:

- poorer quality sample for the face samples resulting from sampling selection bias, and:
- face sample volume is much greater than the diamond sample volume, therefore may be more representative sample than DD in a high nugget environment.

Reconciliation data suggests the face samples may be more representative than the DD samples in Agnew's high nugget gold deposits. The use of face samples in the resource estimates is limited to the area immediately surrounding underground development.

The Qualified person is of the opinion that the drilling protocols described in this report are adequate to minimize material errors and provide the necessary technical assurance.

9.4 Sampling

Core cutting sheets are generated in acQuire®, and once populated during the logging and sampling process, are re-imported. Some data, such as core logging and underground development face sampling, is entered or edited manually into the acQuire® database table forms or data entry objects. A unique sample dispatch is generated in acQuire® and emailed to the laboratory. Returned assays from the laboratory are linked to this dispatch and are emailed as a SIF file. These files include detailed information about the batch, methods, units, detection limits and elements assayed. The file also includes all QC data in the sequence of analysis.

The Qualified person is of the opinion that the sampling protocols are adequate to minimize material errors and the analytical procedures reflect industry standard practice or better and are appropriate for resource estimation.

9.5 Survey

Additional drill hole validation is completed using Datamine® or Leapfrog® software. This validation checks for unique collar locations, overlapping intervals, excessive down hole deviation, and matching total drill depth within all tables. Errors are reviewed and either corrected or flagged and excluded from use in the estimation. All issues identified are corrected in the acQuire® database.

The Qualified person is of the opinion that the survey protocols are adequate to minimize material errors.

9.6 Sample analysis

The GFA QAQC procedure is reviewed every two years. Assay certificate verification and assay laboratory audits are completed as per GFA SOX requirements minimum on a Quarterly review.

The Qualified person is of the opinion that the sample analysis protocols are adequate to minimize material errors.

9.7 Geological modelling

Geological interpretation has the potential to impact materially on the estimated quantity and quality of a Mineral resource and Mineral reserve and assumptions regarding volume and geological and/or grade continuity are important to support the correct estimate of contained metal. Support from expert geologists, site and corporate peer reviews, external reviews, and the Model Change Authorisation (MCA) process ensure that the geological interpretation is one that would be universally supported and independently arrived at.

The Qualified person's opinion of the geological modelling is:

(a) The geological modeling protocols are adequate to minimize material errors

a) The controls have been reviewed and the adequacy is reasonable and that material bias or errors are unexpected

b) The systems to reduce human and procedural errors, checks and balances are adequate and minimize material errors

c) The protocols are adequate as reviewed and that the Mineral resource models are based on sound data and are reasonable

10 Mineral processing and metallurgical testing

10.1 Testing and procedures

The Agnew operation currently comprises of two operating underground mining complexes (Waroonga and New Holland), and multiple potential future open pits and underground mines.

Routine metallurgical recovery testwork is undertaken on core samples selected from projects representing potentially prospective Mineral reserves. Upon definition of discrete geological domains or lithologies, individual composite samples of diamond drill core are selected and collected by the relevant geologist for subsequent laboratory-scale metallurgical response testwork. Samples are typically composited from diamond core drilling to obtain single continuous mineralized intercepts (including expected internal and external ore dilution) from a known single spatial location, typically (and more recently) representing single geological domains or lithologies.

The number of samples selected per potential ore mining source is approximately based upon the nature (size and geological homogeneity) of the orebody, the study stage (i.e., scoping, pre-feasibility or feasibility), and the variability of the metallurgical recovery response, when known. Agnew follows the Gold Fields Australia Metallurgy Testwork Sampling Guideline which sets out the minimum requirements for testing process and protocol. The core samples are dispatched to an independent third-party laboratory for testing, currently ALS Metallurgy, Balcatta, Western Australia, which is an industry accredited quality assured laboratory. The Gold Fields standard testwork protocol is designed to reasonably reflect the performance of the existing process plant and typically includes:

(a) Head analysis multi-elemental scans (including Au (gold), Ag (silver), Cu (copper), As (arsenic), C-suite (carbon), S-suite (sulphur), Hg (mercury), Sb (antimony), Te (tellurium) and quantified x-ray diffraction (QXRD) analyses.

d) Acid mine drainage (AMD) analysis, being Total S, Acid Neutralisation Capacity (ANC), Net Acid Generation (NAG), Total Acid Production Potential (TAPP), Net Acid Production Potential (NAPP), Net Acid Generation (NAG), and pH.

e) Comminution characteristics including crushing work index, abrasion index (Ai), Bond BWI and SMC SAG milling parameters.

f) Gravity recovery estimation by laboratory Knelson recovery, followed by mercury amalgamation of concentrate.

g) Leaching profile of gravity/amalgam tails, including leaching profile of Au, Ag, Cu, pH, dissolved oxygen (DO), and free cyanide.

h) Multi-elemental Inductively coupled plasma mass spectrometry (ICP) scans of final leach solution.

i) Leach solids residue analysis for Au, Ag and Cu.

j) Diagnostic analysis of tailings residue if warranted.

Metallurgical testwork programmes are ongoing at Agnew, based upon progressive drilling and the definition of new or existing mining area extensions that are associated with the exploration programmes. Recent metallurgical programmes included testwork carried out on core samples taken from potential mining areas at Redeemer North, Barren Lands Underground and Hidden Secret.

For extensions to currently mined projects or the re-establishment of former mines, existing testwork is reviewed for sample representation across the remaining orebody.

10.2 Relevant results

10.2.1 Sample Head Analyses

Table 10.2.1 shows a summary of the average sample head analyses for the Waroonga underground mine grouped by mining area. The underground ore samples are reasonably enriched in arsenic (As), sulphide sulphur (S sulphide), nickel (Ni), calcium (Ca), aluminium (Al), and magnesium (Mg) and contain relatively low concentrations of organic carbon (C organic), cadmium (Cd), and mercury (Hg).

Table 10.2.1: Summary of Waroonga underground mine areas average sample head analyses

Species	UOM	Kim / Edmunds	FBH	Main	Rajah	Waroonga North	Kath
Sample Count	No.	5	9	4	2	11	13
Au	ppm	9.50	8.59	8.52	6.57	14.24	12.73
Ag	ppm	0.49	1.09	0.53	0.38	1.49	1.44
As	ppm	8272	6647	4900	8600	3139	7078
Al	%	1.88	3.74	2.56	6.00	2.64	3.79
Ba	ppm	32	134	70	380	36	156
Be	ppm	< 20	< 20	< 20	< 20	< 20	< 20
Bi	ppm	<10	<10	22	<10	<10	10
C total	%	0.06	0.15	NA	NA	0.13	0.10
C organic	%	0.06	0.04	NA	NA	0.03	0.02
Ca	%	1.68	3.88	3.69	3.68	2.78	3.17
Cd	ppm	< 20	< 20	< 20	< 20	< 20	< 20
Co	ppm	22	43	65	40	37	43
Cr	ppm	435	1400	1794	900	1132	1231
Cu	ppm	12	61	71	78	75	94
Fe	%	2.26	4.64	5.57	5.82	4.10	4.68
Hg	ppm	0.08	0.06	0.09	0.08	0.06	0.05
K	%	0.07	0.24	0.13	0.23	0.06	0.22
Li	ppm	17	22	18	20	14	23
Mg	%	2.54	6.92	8.54	6.30	6.09	6.47
Mn	ppm	365	753	925	950	633	676
Mo	ppm	< 5	< 5	< 5	< 5	< 20	< 5
Na	%	0.79	0.62	0.21	2.66	0.27	0.78
Ni	ppm	197	487	770	470	509	516
P	ppm	270	258	219	313	< 250	296
Pb	ppm	44	33	18	45	20	262
S total	%	0.40	0.58	0.39	0.48	0.21	0.43
S sulphide	%	0.21	0.48	0.35	0.46	0.16	0.37
Sb	ppm	2.38	2.82	2.88	5.55	2.61	5.62
Sr	ppm	127	197	61	208	81	125
Te	ppm	0.6	1.1	1.7	0.7	0.2	1.3
Ti	ppm	860	2067	1900	2800	1291	1785
V	ppm	31	79	71	95	60	86
Y	ppm	< 100	< 100	< 100	< 100	< 100	< 100
Zn	ppm	28	67	48	75	45	51

Source: Agnew CPR 2021

Table 10.2.2 shows a summary of the average sample head analyses for the other Agnew underground mines, New Holland-Sheba, Redeemer and Barren Lands. Observations of these underground ore sample results, potentially relevant to mineral processing, include the following:

- New Holland - Sheba – relatively enriched in arsenic (As)
- Redeemer Zone 2 – relatively enriched in arsenic (As), with some tellurium (Te)
- Redeemer North – relatively enriched in nickel (Ni), and lead (Pb)
- Barren Lands - – relatively enriched in arsenic (As), nickel (Ni) and antimony (Sb)

Table 10.2.2: Summary of Agnew underground mine areas average sample head analyses

Species	UOM	New Holland Sheba	Redeemer Zone 2	Redeemer North	Barren Lands Sulphide
Sample Count	No.	3	10	12	12
Au	ppm	8.57	6.53	5.94	8.81
Ag	ppm	0.60	0.83	< 0.3	1.01
As	ppm	3267	8016	20	5703
Al	%	3.56	5.12	4.36	6.57
Ba	ppm	873	638	74	320
Be	ppm	< 20	< 20	< 20	< 20
Bi	ppm	<10	<10	<10	14
C total	%	0.18	0.23	0.80	0.93
C organic	%	0.04	0.02	0.02	0.02
Ca	%	0.53	1.38	7.04	5.14
Cd	ppm	< 20	< 20	< 20	< 20
Co	ppm	10	13	90	28
Cr	ppm	58	301	2050	448
Cu	ppm	12	46	64	50
Fe	%	0.91	1.96	8.00	4.30
Hg	ppm	0.15	0.05	0.10	0.35
K	%	1.27	0.52	0.76	0.65
Li	ppm	10	10	37	18
Mg	%	0.37	1.32	11.32	3.40
Mn	ppm	120	310	1100	871
Mo	ppm	< 5	< 5	< 20	< 5
Na	%	1.58	3.06	0.44	2.71
Ni	ppm	60	102	713	229
P	ppm	292	205	179	442
Pb	ppm	53	46	< 5	47
S total	%	0.17	0.50	0.02	0.34
S sulphide	%	0.14	0.44	0.01	0.28
Sb	ppm	1.30	2.99	0.73	5.26
Sr	ppm	178	174	162	369
Te	ppm	0.2	1.4	0.2	0.2
Ti	ppm	733	1380	2550	2600
V	ppm	16	44	155	79
Y	ppm	< 100	< 100	< 100	< 100
Zn	ppm	38	25	42	70

Source: Agnew CPR 2021

Table 10.2.3 shows a summary of the average head grade analyses for the various Agnew's open pits. Observations of the open pit's ore sample results, potentially relevant to mineral processing, include the following:

(a) Barren Lands (oxide) – relatively enriched in nickel (Ni) and zinc (Zn), slight enrichment in mercury (Hg)

a) Claudius – relatively enriched in nickel (Ni), copper (Cu) and tellurium (Te)

b) 450 South – relatively enriched in in nickel (Ni) and zinc (Zn)

c) Leviathan North - relatively enriched in zinc (Zn)

d) Hidden Secret - relatively enriched in arsenic (As) and silver (Ag)

e) Glasgow Lass - relatively enriched in arsenic (As) and copper (Cu)

f) Maria – relatively enriched in copper (Cu), nickel (Ni) and zinc (Zn)

Table 10.2.3: Summary of Agnew open pit mine areas: average sample head analyses

Species	UOM	Barren Lands Oxide	Redeemer Oxide	Claudius	450 South	Leviathan North	Hidden Secret	Glasgow Lass	Maria
Sample Count	No.	7	3	5	5	7	4	5	5
Au	ppm	5.66	2.12	3.47	8.31	3.78	5.98	13.75	12.36
Ag	ppm	0.56	<2	0.54	< 5	0.62	2.03	1.01	0.66
As	ppm	416	6	27	700	451	3638	1838	8
Al	%	6.97	0.05	6.57	4.72	4.80	5.24	5.90	0.37
Ba	ppm	368	802	119	118	66	929	1104	284
Be	ppm	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Bi	ppm	<10	<10	16	<10	<10	<10	<10	<10
C total	%	0.03	0.02	0.31	2.02	NA	0.33	0.15	0.10
C organic	%	0.03	0.02	0.03	0.02	NA	0.02	0.04	0.06
Ca	%	1.15	0.90	5.42	4.04	7.03	1.00	0.55	0.95
Cd	ppm	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Co	ppm	28	27	74	68	43	5	30	46
Cr	ppm	320	800	482	2480	352	133	62	198
Cu	ppm	57	57	166	66	103	14	101	131
Fe	%	5.03	2.75	9.45	7.04	9.32	1.33	1.28	6.06
Hg	ppm	0.12	0.15	0.06	0.06	0.05	0.14	0.13	0.23
K	%	0.59	0.73	0.45	0.22	0.36	1.79	1.96	1.44
Li	ppm	18	12	45	18	19	9	9	22
Mg	%	2.30	1.52	3.86	11.83	5.21	0.61	0.49	1.94
Mn	ppm	762	567	1340	1100	514	194	183	1235
Mo	ppm	< 5	< 5	< 20	< 20	< 5	< 5	< 20	< 5
Na	%	2.99	2.62	1.28	1.12	0.09	2.54	2.33	0.50
Ni	ppm	285	142	233	920	129	38	67	194
P	ppm	500	367	420	325	< 250	188	290	170
Pb	ppm	39	43	16	24	22	54	60	93
S total	%	< 0.02	0.03	0.11	0.27	0.02	0.34	0.10	0.46
S sulphide	%	< 0.02	< 0.02	0.09	0.17	0.02	0.25	0.06	0.32
Sb	ppm	1.73	1.37	1.48	1.84	0.43	1.50	1.52	4.50
Sr	ppm	233	195	104	150	51	253	242	79
Te	ppm	0.2	0.5	1.8	< 0.2	0.1	0.5	0.1	0.2
Ti	ppm	2857	2000	7000	2400	3771	1000	1000	4480
V	ppm	82	106	259	110	103	23	23	178
Y	ppm	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Zn	ppm	87	39	74	112	114	36	28	106

Source: Agnew CPR 2021

10.2.2 Metallurgical recovery

A summary of the number and results of laboratory recovery tests carried out on samples taken from key selected mining areas is shown in Table 10.2.4.

Table 10.2.4: Summary of metallurgical test quantities and recovery results for key mineralisation areas

Mineral reserve area	Metallurgical samples [1]	Average grade of samples [2]	Average gravity recovery	Average total gold recovery [3]	Lowest total gold recovery	Highest total gold recovery
	(No.)	(Au g/t)	(%Au)	(%Au)	(%Au)	(%Au)
Underground						
Waroonga-Kim and Edmunds	16	9.48	75.4	94.6	85.7	98.8
Waroonga-FBH	13	6.99	71.3	92.9	78.2	98.3
Waroonga-Main, Main South, Rajah	8	4.38	44.0	85.5	74.3	99.1
Waroonga-North	7	11.05	71.6	97.4	88.2	98.9
Waroonga-Kath	13	13.20	54.4	94.1	69.0	98.4

Mineral reserve area	Metallurgical samples [1]	Average grade of samples [2]	Average gravity recovery	Average total gold recovery [3]	Lowest total gold recovery	Highest total gold recovery
	(No.)	(Au g/t)	(%Au)	(%Au)	(%Au)	(%Au)
New Holland-Sheba	2	2.37	82.7	97.9	92.9	98.4
Barren Lands	10	8.16	64.6	95.3	85.8	97.6
Redeemer (Zone 2 & North)	24	7.28	47.5	93.2	73.1	98.7
Open Pit						
Barren Lands	7	7.16	28.1	97.3	96.7	99.4
Claudius/Cox	5	3.50	20.7	93.7	71.9	98.9
450 South	5	6.34	68.4	97.7	92.9	98.9
Leviathan North	7	3.74	38.7	97.7	91.4	99.6
Hidden Secret/Glasgow Lass	10	11.05	67.8	95.7	90.6	99.2

Notes:
1. For samples where multiple tests carried out at different conditions on a single sample, the result used for this table was selected for conditions considered to most closely match the performance of the plant
2. Grade reported is the back-calculated grade of the sample, based on gold mass balance
3. This recovery reported is for information and comparative purposes only and is not used for reserves calculations. Reserves are instead calculated on the basis of the determined grade-recovery model

Source: Agnew CPR 2021

The ore sources are typically sufficiently different in character such that, where appropriate, a fixed or grade recovery model per ore source is assigned based upon the available testwork results. For some ore sources, an overall grade-recovery relationship based on known historical process plant performance is assigned (e.g., New Holland underground). Table 10.2.5 summarizes the plant recovery estimation models for the various gold ore sources (current and future potential ore source) as derived from either metallurgical testwork results or historical plant operating experience.

The model recovery outputs obtained from these equations are further constrained to be within the minimum or maximum recovery values as shown in Table 10.2.5.

Table 10.2.5: Summary of the 2021 plant gold recovery estimation models for Agnew

			Minimum	Maximum	Metallurgical Recovery Formula
Undergrounds	Waroonga	Kim	90.0 %	96.0 %	Rec = (Au - (0.06722 * Au^ 0.85974)) / Au
		Main	70.0 %	96.0 %	Rec = 0.750765 * Au^ 0.09206
		Rajah	70.0 %	85.0 %	Rec = (Au - (0.33676 * Au^ 0.6702)) / Au
		North	88.0 %	98.0 %	Rec = 0.891292 * Au^ 0.0326
		Kath Lower	85.0 %	96.0 %	Rec = (Au - (0.08985 * Au^ 0.81841)) / Au
	New Holland	Genesis			Rec = 96.0 %
		Sheba	90.0 %	96.0 %	Rec = 0.93809 * Au^ 0.03251
	Redeemer	Zone 2	85.0 %	94.0 %	Rec = (Au - (0.18037 * Au^ 0.56699)) / Au
		North - RN1 C1/C3			Rec = 94.3 %
		North - RN1 C2			Rec = 84.7 %
		North - RN2			Rec = 97.0 %
	Barren Lands U/G		70.0 %	96.0 %	Rec = 0.881317 * Au^ 0.03342
Open Pits	Maria		90.0 %	98.0 %	Rec = (Au - (0.01651 * Au^ 0.94126)) / Au
	450 South		90.0 %	96.0 %	Rec = (Au - (0.0277 * Au^ 0.80205)) / Au
	Barren Lands				Rec = 96.0 %
	Glasgow Lass		90.0 %	96.0 %	Rec = 0.943497 * Au^ 0.015469

Notes:
a) These recovery formulas are used in the life of mine Mineral reserve and techno-economic model
b) The resource recovery is included in Table 11.2.1
c) The reserve recovery is included in Table 12.3.1

Original source: Agnew AGM 2021 Cut-off Grade – Underground & Open Pits [C2022 Planning] with some subsequent amendments made

The recent performance of the Agnew process plant is provided in Table 12.2.1 for comparison. The processing recovery for underground ore sourced from the Waroonga and New Holland mining areas was 95.0 % in 2021, 94.6 % in 2020 and 94.2 % in 2019.

10.2.3 Ore hardness

The metallurgical testing programme at Agnew includes ore hardness testing, typically being the crushing work index, abrasion index (Ai), Bond BWI (ball work index) and SMC (Steve Morrell Consulting) SAG milling parameters. To estimate mill throughput expectations for future ores from the hardness test results, the Morrell Total Power method is used, which provides an estimate of overall grinding circuit power requirement in kWhr/t using the Steve Morrell Consulting parameters (SAG mill, Mia and Ball mill, Mib) which are calculated from the Bond ball work index (BWI) test and the SMC drop weight index test results.

To provide a link to the mill feed schedule the test results are grouped by ore source, also considering the distinction between oxide and fresh ores which have relatively different hardness properties.

The grouped ore hardness indices and total milling power draw requirement estimates are shown in Table 10.2.6 for a final grind size of 80% passing 125 um, listed in order of increasing estimate of power draw.

Table 10.2.6: Summary of rock hardness indices and mill power requirement estimates for Agnew

Ore Source	Mine type	Oxidation state	Rock SG	SAG index, Mia	Ball index, Mib	Mill power required motor
			(t/m³)	(kWhr/t)	(kWhr/t)	(kWhr/t)
Open Pits - Mixed	Open Pit	Oxide	2.65	11.9	10.0	8.8
Barren Lands	Open Pit	Oxide	2.59	11.7	11.4	9.4
Redeemer North	Underground	Fresh	2.63	13.9	12.4	10.7
Waroonga	Underground	Fresh	2.84	16.4	16.2	13.2
Redeemer Zone 2	Underground	Fresh	2.71	22.8	16.2	15.7
Barren Lands	Underground	Fresh	2.78	22.9	21.8	18.1
New Holland	Underground	Fresh	2.79	25.8	19.3	18.2

Source: Agnew CPR 2021

From an operational perspective, the mill throughput is managed on a short to medium term basis, considering mined ore supply availability, gold grades of the available mined ores, and the plant downstream constraints (e.g., tailings pumping capacity), through the selection of the crusher/mill feed blend.

As at the end of 2021, Waroonga and New Holland underground ores are the only two ore sources (shown emphasized in Table 10.2.6) that are being mined and fed to the processing plant.

10.3 Plant Sampling

Daily composite samples of process plant feed and tailings streams are taken to assist with on-site gold accounting and reconciliation. These samples are collected using a combination of automatic sampling stations as well as manual cuts using appropriately designed samplers. The analysis of the samples used for accounting purposes is conducted by ALS at its Kalgoorlie laboratory.

Solid sample composites are analyzed using fire assay with an AAS finish. Carbon sample composites are analyzed using high temperature ashing, acid digest and an AAS finish. Solution sample composites are analyzed using DIBK extraction and an AAS finish. All laboratory assaying procedures are aligned with standard industry practices.

In accordance with Gold Fields Plant Metal Accounting Standard, a gold in circuit survey is undertaken monthly to reconcile (by mass balance) the back-calculated gold grade of the mill feed with the mill feed grade estimates obtained using plant samples and assays. The monthly variance between the assayed grade and the back-calculated grade is monitored, and an investigation is required to be carried out if this variance exceeds the minimum allowable levels outlined in the Gold Fields Plant Metal Accounting Standard.

10.4 Deleterious Elements

The testwork procedures include analysis for elements that could be deleterious to plant recovery (e.g., arsenic, tellurium, antimony and organic carbon). However, to date no specific deleterious mineral species have been identified that significantly and consistently influence gold recovery estimates.

Many of the Agnew ore sources are notably enriched in arsenic grade, however, based upon the metallurgical testwork results, it appears that high arsenic content is not a reliable indicator of lower gold recovery. Further to this, due to the limited availability of arsenic grade data in the exploration assay database, it is not possible to estimate arsenic grade distribution within the Agnew mineralisation areas.

10.5 Metallurgical Risks

In the opinion of the Qualified person, the combination of a well-established processing plant with a known operating history of treating ores mined from the associated mining leases, together with the ongoing and active metallurgical testwork programme assessing core samples selected from future local mineralisation areas, provides a reasonable platform for estimating the associated metallurgical and processing modifying factors underpinning the 2021 Mineral reserves.

However, it is noted that uncertainties remain, and some key potential areas of risk and uncertainty are discussed in the following sections.

10.5.1 Sample Representativity

Metallurgical sample selection is an important aspect of the process of developing resources into reserves. The results of the testwork undertaken on those samples are often used directly as input into plant performance estimates that are then used for the life of mine and reserve financial evaluations. It is important that the metallurgical samples are representatively selected, for example, to cover a suitable range of gold head grades, to consider the different geological lithologies and domains expected to be encountered, and to appropriately incorporate internal and external material dilution expected during the mining process. Individually testing different head grades ranges and geological domains improves the ability to see the metallurgical response variability of the orebody, which improves the ability to make better judgements and estimates about how the material could perform in the processing plant.

As new potentially economic mineralized areas are identified at the mine, the site's exploration geologists and metallurgists will select a few, to several, core composite samples of each new mineralisation area, and submit to a commercial metallurgical laboratory for the undertaking of a defined testwork programme including, head assays, recovery, and physical properties analyses.

Whilst effort and care are taken with the sample selection process, there are practical constraints to samples numbers due to core availability and testwork cost, and therefore it is not possible for the Qualified person to guarantee that the proposed reserves have been fully representatively sampled, and therefore some inherent uncertainty will remain.

10.5.2 Laboratory Test Methods and Scale-up

The laboratory test results require scale-up to estimate performance through the industrial processing facility.

The metallurgical testing regime adopted has been specifically tailored to provide results that reasonably and practically represent the actual installed processing facility. This regime has been developed from experience gained over many years of undertaking such work, culminating in eventual mining, and processing of ores that have been historically metallurgically tested.

Gravity and leach recoveries achieved in the laboratory are assumed to be achievable within the plant. Overall laboratory recovery results are typically model-fitted to a bounded sample head grade relationship, and this resulting model is assumed to be reasonably achievable at plant scale.

Hardness properties are applied to the Morrell Total Power method to estimate grinding mill throughputs.

However, there remains potential risk associated with the delivery of these metallurgical testing results associated with the differences between laboratory methods and full-scale processes, and miscellaneous and unidentified errors associated with undertaking the testing.

The selected laboratory (ALS Metallurgy, Balcatta, Western Australia) that is undertaking the metallurgical testwork is highly regarded within the local gold mining industry, and has an established history of performing well, with both Gold Fields and the Qualified person.

No pilot-plant testing is carried out prior to reserve declaration and subsequent mining, and the metallurgical properties are based on bench scale test results only. The sample requirements and cost for pilot testing are considered as being prohibitive. However, given the relative simplicity of Agnew's processing facility, a history of successful operation, and in being consistent with practices adopted for other similar operations, it is the opinion of the Qualified person that pilot plant testing is not required for the estimation of plant modifying factors for the 2021 reserves.

Despite reasonable efforts and care in the application of scale-up factors and modeling methods, there remains some inherent uncertainty in actual performance of the industrial facility predicted from a small volume of small-scale laboratory tests. One of the key challenges in confirming scale-up is the practice of ore blending of the plant feed (to optimize overall performance of the plant) which can limit regular direct comparison of plant performance and laboratory test results over the longer term.

10.5.3 Deleterious Elements

The routine metallurgical testwork programme includes detailed head analysis (multi-element ICP-MS scan) to check for quantities of potential deleterious elements to the plant, such as mercury, arsenic, organic carbon, antimony, tellurium, base metals, etc.

Whilst this assessment is carried out on the limited number of metallurgical composite samples, it is not typically undertaken on individual exploration samples.

The multi-elemental assay results obtained from the metallurgical samples are used as a guide to identify if there are any deleterious elements at concentrations that would be of reasonable concern that could materially impact plant performance. If such a species is identified then the option to submit a larger number of individual exploration samples for detailed analysis, to better quantify and locate the deleterious species, is readily available.

However, it needs to be recognized that the relatively low number of metallurgical samples initially checked for deleterious elements means that some inherent risk remains of unexpectedly encountering such a species during subsequent mining and processing operations, despite such elements not being identified during metallurgical testing.

11 Mineral resource estimates

Agnew's Mineral resources undergo an initial assessment through the application of a range of assumed technical and economic factors to ensure reasonable prospects for economic extraction. The in-situ cut-off grade has modifying factors applied and all material within the pit shell or MSO shape above the calculated cut-off grade is judged to have reasonable prospects for economic extraction. The Mineral resources are 100 % attributable to Gold Fields and are net of production depletion up to 31 December 2021. The point of reference for the Mineral resources is in-situ over a minimum mining width with dilution applied. Open pit Mineral resources are confined to pit shells and underground Mineral resources are constrained to a practical mining shape and a minimum mining width.

11.1 Mineral resources estimation criteria

11.1.1 Geological model and interpretation

Agnew's Mineral resources are estimated from three-dimensional (3D) models of the in-situ gold mineralisation. These resource models are based on the mineralized domain and geostatistical zone models which are developed to reflect the current understanding of the controls on mineralisation. The models are constructed by Agnew site geologists through a process of geological interpretation considering lithology, structural controls, alteration and mineralisation in plan, section and orthogonal three-dimensional 3D views. Each model is reviewed and updated as new information is collected.

Geological surfaces and volumes are represented using wireframes. These are generated through triangulation or interpolation techniques based on intervals selected by the geologist from drill holes. Mineralisation volumes are generally represented by wireframes; however, for some mineralisation styles, probabilistic interpolation models are also used.

Prior to block modelling and grade estimation, the geological interpretations undergo a documentation peer review and sign-off process. All files used and created in the interpretation process are stored on the Agnew IT network.

If logging data does not fit the mineralisation model or the surrounding holes in the interpretation, a validation/review of the original logging is carried out. This may result in re-logging of the hole or a change to the model and interpretation depending on the outcome of the review.

11.1.2 Block modelling

3D block models of the in-situ mineralisation are constructed based on the geological interpretations. The block models utilize sub-celling to ensure the block model volume closely represents the volume of the wireframe model. At the end of the modelling process, the volume is depleted to account for material already mined out. The various block models utilized for the estimates are summarized in Table 11.1.1.

Table 11.1.1: Summary of mineral inventory models

Model	Model name	Year	Axis	Origin	Parent block size (m)	Number of blocks	Min subcell size (m)	Max subcell size (m)
Claudius	1810.cl.md.dm	2018	Easting (X)	79740	5	212	0.5	5
			Northing (Y)	29500	10	190	0.5	10
			Elevation (Z)	9600	10	91	0.5	10
Maria	1904.mar.md.eng.dm	2019	Easting (X)	259600	5	40	0.2	5
			Northing (Y)	6919900	5	810	1.25	5
			Elevation (Z)	40	5	320	0.005	5
Cams	0805.cams.lg.0.md.dm	2008	Easting (X)	57320	10	45	1.25	10
			Northing (Y)	29908	12.5	34	1.25	12.5
			Elevation (Z)	318	3	50	0.1	3
Redeemer Zone 2 & Redeemer North	red.2109.md.dm	2021	Easting (X)	79600	20	50	0.2	20
			Northing (Y)	31500	20	143	2.5	20
			Elevation (Z)	9365	20	57	0.2	20
Barren Lands	2109.bl.md.dm	2021	Easting (X)	79970	20	26	0.2	19.8
			Northing (Y)	34650	20	76	2.5	17.5
			Elevation (Z)	9800	20	36	1	19
450 South	1809.450.md.dm	2018	Easting (X)	79790	20	16	0.2	20
			Northing (Y)	38500	20	30	2.5	20
			Elevation (Z)	10310	20	12	1	20
Kim	2107.kim.md.dm	2021	Easting (X)	79900	10	85	0.1	10
			Northing (Y)	39800	10	75	1.25	10
			Elevation (Z)	8950	10	120	0.5	10
FBH	fbh.2105.md.dm	2021	Easting (X)	79010	20	34	0.1	20
			Northing (Y)	39060	20	55	2.5	20
			Elevation (Z)	8970	20	39	1	20
Kath	kwn.2109.md.dm	2021	Easting (X)	79090	20	47	0.1	20
			Northing (Y)	39900	20	79	2.5	20
			Elevation (Z)	9090	20	71	0.2	20
Waroonga North	kwn.2109.md.dm	2021	Easting (X)	79090	20	47	0.1	20
			Northing (Y)	39900	20	79	2.5	20
			Elevation (Z)	9090	20	71	0.2	20
Main North Main South Rajah	1909.mr.md.dm	2019	Easting (X)	79450	5	116	1	5
			Northing (Y)	38940	5	192	1	5
			Elevation (Z)	9750	5	152	1	5
Lower Genesis (LGX)	lgx.2107.c.md.dm	2021	Easting (X)	3500	10	55	1.0	10
			Northing (Y)	11500	10	250	0.5	10
			Elevation (Z)	100	10	120	0.2	10
Cinderella	cind.2002.md.eng.dm	2020	Easting (X)	3780	20	26	1.25	10
			Northing (Y)	10500	20	53	1.25	12.5
			Elevation (Z)	1100	10	42	0.1	3
Sheba	sh.2109.s.md.eng.dm	2021	Easting (X)	3340	20	33	0.2	20
			Northing (Y)	8800	20	135	1	20
			Elevation (Z)	160	10	77	0.1	10
Upper NH & Upper Genesis	nhg.1909.md.dm	2015	Easting (X)	3350	20	35	1	20
			Northing (Y)	10900	20	95	1	20
			Elevation (Z)	700	10	82	0.2	10
GE200	ge200.1504.2.md.eng.dm		Easting (X)	3580	20	18	1	20
			Northing (Y)	12500	20	51	1	20
			Elevation (Z)	1180	10	16	0.2	10
Himitsu	ghs.2008.s.md.eng.dm	2020	Easting (X)	3400	20	34	1	20
			Northing (Y)	9100	20	92	1	20
			Elevation (Z)	900	10	66	0.1	10
Hidden Secret, Glasgow Lass, & Dobra Serica	ghs.2008.s.md.eng.dm	2020	Easting (X)	3400	20	34	1	20
			Northing (Y)	9100	20	92	1	20
			Elevation (Z)	900	10	66	0.1	10
Leviathan North	1904.ln.md.dm	2019	Easting (X)	270150	20	43	1	20
			Northing (Y)	6891300	20	85	1	20
			Elevation (Z)	200	5	128	0.5	5

Source: Agnew CPR 2021

11.1.3 Bulk density

Dry bulk density is assigned to the model based on the geological interpretation of lithology and weathering. Average density values are estimated for each geological unit based on regular and systematic measurements taken on exploration diamond drilling core according to a formal protocol (refer to Section 7.5). Hand specimens from operating underground mining areas are also collected to confirm values. On new projects where no data is available, known densities from similar deposits are used until actual data becomes available. See Table 7.5.1 for density values used at Agnew.

11.1.4 Compositing and domaining

Analysis of the grade data is carried out prior to estimation. Samples, predominately from Diamond and Reverse circulation drilling are composited to one metre intervals for broad mineralized zones. For narrow mineralized lodes, compositing is to the full width of the lode and the length is corrected to reflect the true width across the lode.

The output composited drill hole assay database is uniquely flagged with mineralized domain codes using the interpretation boundaries. Additional sub-domains are added where distinct grade populations exist within the broader interpretation domains. The relationship between domains is assessed to determine how they are used during grade interpolation. Distinct domains utilize hard grade boundaries during interpolation. Where domains share similar gold distribution characteristics, a soft or gradational boundary is used for interpolation.

11.1.5 Top cuts

Top cuts are used to control grade outliers during estimation. Grades above a selected threshold are capped to the threshold, therefore retaining the high-grade nature locally while controlling the influence on the estimation. Top cuts are determined per domain through analysis of probability plots, histograms and reviewing the samples at the top end of the grade distribution. Commonly the selected thresholds correspond to the 97.5 to 99 percentiles of the distribution. Top cuts for one metre composites are selected on gold grade after compositing. Top cuts for full width lode composites are selected on accumulated metal after compositing.

The top cuts used for the various resource models are presented in Table 11.1.3.

11.1.6 Variography

A variogram is a description of the spatial continuity of the data and the estimation methods used at Agnew rely on the properties of the variograms and therefore this is an important aspect of the estimation process. Variogram studies are carried out on composited data for individual domains on gold or accumulated metal (gold x true thickness). The variogram analysis is used to evaluate the spatial continuity of the mineralisation and to create a three-dimensional (3D) or two-dimensional (2D) model of how grades change with distance. The analysis of the variography is used to determine the search parameters in the grade estimation process. For further detail on variography and estimation parameters refer to Table 11.1.2.

Table 11.1.2: Summary of variogram parameters

Mineral resource	Main domain	Variable/ 2D/3D	Variogram type	Direction	Nugget	Sill 1	Range 1 (m)	Sill 2	Range 2 (m)	Sill 3	Range 3 (m)
Claudius	Basalt lode	Gold 3D	Normal scores (back-transformed)	1 (-34°→347°) 2 (42°→041°) 3 (-30°→100°)	0.600	0.250	12 12 2.5	0.150	40 22 13	-	- - -
Maria	Main lode	Accumulation 2D	Normal scores (back-transformed)	1 (-40°→000°) 2 (50°→000°)	0.280	0.300	10 10	0.420	60 20	-	- -
Cams	Main lode	Gold 3D	Normal scores (back-transformed)	1 (-10°→003°) 2 (-28°→267°) 3 (60°→290°)	0.360	0.520	15 10 10	0.120	1000 40 20		
Redeemer Zone 2 & Redeemer North	Zone 2 North	Accumulation 2D	Normal scores (back-transformed)	1 (-10°→000°) 2 (80°→000°)	0.270	0.340	40 15	0.260	75 70	0.130	250 160
	Redeemer North	Gold 3D		1 (00°→340°) 2 (-80°→250°) 3 (10°→250°)	0.590	0.220	20 25 5	0.190	60 60 15	-	- - -
Barren Lands	Main lode	Accumulation 2D	Normal scores (back-transformed)	1 (40°→000°) 2 (50°→180°)	0.360	0.510	40 20	0.130	60 35	-	- -
450 South	Cross lode	Gold 3D	Normal scores (back-transformed)	1 (-50°→320°) 2 (-40°→140°) 3 (00°→230°)	0.510	0.310	8 3 3	0.180	20 8 8	-	- - -
Kim	Kim lode	Gold Pseudo 2D	Normal scores (back-transformed)	1 (-85°→000°) 2 (5°→000°) 3 (00°→090°)	0.363	0.325	5 5 5	0.095	30 20 4	0.220	260 80 1
FBH	Bengal lode	Accumulation 2D	Normal scores (back-transformed)	1 (-49°→319°) 2 (26°→196°)	0.210	0.350	20 7	0.220	50 20	0.220	80 25
Kath	Kath lode	Accumulation 2D	Normal scores (back-transformed)	1 (70°→000°) 2 (20°→180°)	0.300	0.160	35 20	0.160	70 55	0.380	230 55
Waroonga North	Aurora lode	Accumulation 2D	Normal scores (back-transformed)	1 (55°→000°) 2 (35°→180°)	0.360	0.210	15 6	0.210	30 20	0.220	200 35
Main North Main South Rajah	SKcU3 Lode 201	Gold 3D	Normal scores (back-transformed)	1 (-52°→330°) 2 (34°→000°) 3 (-15°→080°)	0.500	0.190	9 9 5	0.130	15 15 12	0.180	40 40 16
	SKcU2 Lode 401			1 (-58°→301°) 2 (18°→359°) 3 (-25°→080°)	0.530	0.210	10 10 6	0.130	30 15 15	0.130	250 35 35
Lower Genesis (LGX)	500 series	Gold 2D	Normal scores (back-transformed)	1 (00°→350°) 2 (00°→260°)	0.270	0.550	25 15	0.180	170 55	-	- -
	Easterlies	Gold 3D		1 (00°→150°) 2 (-20°→060°) 3 (70°→060°)	0.460	0.370	7.5 5 5	0.170	75 40 10	-	- - -
Cinderella	620832	Accumulation 2D	Normal scores (back-transformed)	1 (00°→180°) 2 (00°→090°)	0.290	0.340	10 5	0.170	15 10	0.130	35 25
	621410			1 (00°→165°) 2 (00°→075°)	0.300	0.350	15 15	0.160	55 25	0.190	90 45
Sheba	Sheba South lode	Accumulation 2D	Normal scores (back-transformed)	1 (85°→180°) 2 (-05°→180°)	0.500	0.340	43 35	0.160	327 57	-	- -
	Easterlies	Gold 3D	Normal scores	1 (0°→005°) 2 (90°000°) 3 (-80°→275°)	0.19	0.56	28 25 7	0.25	208 153 64	-	- - -
Upper NH & Upper Genesis	Grouped westerlies	Accumulation 2D	Normal scores (back-transformed)	1 (00°→005°) 2 (00°→095°)	0.340	0.420	20 10	0.25	100 25	-	- -
	Easterlies	Gold 3D		1 (00°→160°) 2 (-25°→070°) 3 (65°→070°)	0.36	0.58	10 10 3	0.06	20 20 6	-	- - -
GE200	200 series	Gold Pseudo 2D	Normal scores (back-transformed)	1 (00°→130°) 2 (00°→340°) 3 (90°→000°)	0.470	0.330	35 25 5	0.200	130 40 7	-	- - -
Himitsu	721810 westerly	Accumulation 2D	Normal scores (back-transformed)	1 (00°→130°) 2 (00°→340°)	0.390	0.480	15 15	0.130	72 30	-	- -

Mineral resource	Main domain	Variable/ 2D/3D	Variogram type	Direction	Nugget	Sill 1	Range 1 (m)	Sill 2	Range 2 (m)	Sill 3	Range 3 (m)
Hidden Secret, Glasgow Lass, & Dobra Serica	Main sandstone host unit	Gold 3D	Normal scores	1 (00°→005°) 2 (-80°→275°) 3 (10°→275°)	0.240	0.420	35 18 13	0.340	180 72 30	-	- - -
Leviathan North	Flat Supergene Lode26	Gold 3D	Normal scores (back-transformed)	1 (00°→160°) 2 (00°→070°) 3 (90°→000°)	0.530	0.350	15 10 3	0.120	45 30 10	-	- - -

Notes: a) The variogram parameters for only the primary domain(s) are shown in the table.

b) Normal scores transformed variograms are initially modelled before back-transformation, as they provide an efficient way of dealing with the skewed gold distributions during variogram modelling

c) Pseudo 2D variogram models are derived from experimental variograms on 1m composites flattened to the mid-plane of the lode

Source: Agnew CPR 2021

The Qualified person's opinion is that the variograms are a practical reflection of spatial continuity of the respective mineralisation grades and their application to the geostatistical analysis is adequate to minimize uncertainty and to derive appropriate resource block models for use by the planning engineers.

11.1.7 Grade estimation

Grade estimation is underpinned by the geological interpretation to reflect the controls on gold mineralisation at each deposit. Gold is the only grade variable considered and as such, no correlations between elements are made for resource estimation.

Advanced geostatistical grade estimation techniques such as ordinary kriging (OK), simple kriging (SK) and conditional simulation (CS) are utilized at Agnew (Table 11.1.3). The grade estimation technique is selected based on the geological models, data spacing, statistical distributions and spatial analyses of the grade data. The conditional simulation recoverable estimates are localized (LSMU).

Table 11.1.3: Summary of Mineral resource estimation parameters

Mineral resource	Search distances*	Min, max samples	Parent cell sizes (X, Y, Z)	Domains	Estimator	Sample types	Top cuts**
Claudius	65 m x 40 m x 10 m	10, 20	5 m x 10 m x 10 m	Lode and lithology	3D OK Au	30 % surface core 45 % underground core 20 % surface RC	30 – 200 g/t Au
Maria	40 m x 20 m x 20 m Octant search 30 m x 20 m x 10 m (HW)	6, 16 (lodes) 8, 12 (HW)	20 m x 20 m x 20 m 10 m x 10 m x 10 m 5 m x 5 m x 5 m	Lode and lithology	Lodes: 2D OK Accumulation Halo: 3D OK Au HW: 3D OK Au	Mainly surface RC some NQ core.	80 – 100 mg/t GM
Cams	50 m x 50 m x 10 m	8, 60	10 m x 12.5 m x 3 m	Lode	3D OK Au	Mainly surface RC, some core	35 g/t Au
Redeemer Zone 2 & Redeemer North	250 m x 160 m x 10 m 90 m x 90 m x 15 m	4, 16 12, 40	20 m x 20 m x 20 m 10 m x 10 m x 10 m 5 m x 5 m x 5 m	Lode and lithology	Lodes: 2D OK Accumulation & 3D OK Au Halo: 3D OK Au	Surface and underground core	Lodes: 12–145 mg/t GM 15-86 g/t Au Halo: 3-10 g/t Au
Barren Lands	75 m x 40 m x 25 m HG lodes 210 m x 50 m x 10 m LG lodes	5, 9	20 m x 20 m x 20 m 10 m x 10 m x 10 m 5 m x 5 m x 5 m	Lode, lithology & weathering	Lodes:2D OK Accumulation Halo: 3D OK Au	Surface RC for shallow areas, core for deeper areas	15 to 160 m g/t GM
450 South	60 m x 40 m x 40 m 40 m x 20 m x 20 m octant search used	4, 12 12, 24	20 m x 20 m x 20 m 10 m x 1 0 m x 10 m 5 m x 5 m x 5 m	Lode and lithology	Lodes: 2D OK Accumulation Cross lode & Halo: 3D OK Au	Mainly surface RC, some core	20 – 50 mg/t GM 20 – 65 g/t Au
Kim	270 m x 80 m x 20 Octant search	10, 24	10 m x 10 m x 10 m	Lode and lithology	Pseudo 2D OK & SK Au	Surface and underground core	2 – 300 g/t Au
FBH	60 m x 40 m x 40 m (lodes) various (halo)	5, 12 (lodes) 12, 24 (halo)	20 m x 20 m x 20 m 10 m x 10 m x 10 m 5 m x 5 m x 5 m	Lode and lithology	Lodes: 2D OK Accumulation Halo: 3D Au OK	Surface and underground core and face (in grade control areas)	Lodes: 5-550 mg/t Halo: 0.8-140 g/t Au
Kath	230 m x 55 m x 55 m Octant search	4, 12	20 m x 20 m x 20 m 10 m x 10 m x 10 m 5 m x 5 m x 5 m	Lode and lithology	Lodes: 2D OK Accumulation Halo: 3D Au OK	Surface and underground core and face (in 5 m x 5 m x 5 m grade control areas)	Lodes: 30-300 m g/t 15-107 g/t Au Halo:1-80 g/t Au
Waroonga North	200 m x 40 m x 10 m Octant search	4, 12	20 m x 20 m x 20 m 10 m x 10 m x 10 m 5 m x 5 m x 5 m	Lode and lithology	Lodes: 2D OK Accumulation Halo: 3D OK Au	Surface and underground core and face (in 5 m x 5 m x 5 m grade control areas)	Lodes: 36-220 m g/t 16-105 g/t Au Halo:1-80 g/t Au
Main North Main South Rajah	100 m x 40 m x 40 m	10, 30	20 m x 20 m x 20 m 10 m x 10 m x 10 m 5 m x 5 m x 5 m	Lode and lithology	3D OK Au	Surface and underground core and faces	40 – 170 g/t Au
Lower Genesis (LGX)	Various (Westerly) 75 m x 40 m x 10 m (Easterly)	10, 20 (Westerly) 10, 30 (Easterly)	10 m x 10 m x 10 m 5 m x 5 m x 5 m	Lode and lithology	Lodes: 2D OK Au Easterlies: 3D OK Au	Surface and underground core and faces	Lodes: 8-200 g/t Au Halo: 1-150 g/t Au
Cinderella	30 m x 20 m x 20 m	3, 6	10 m x 10 m x 10 m 5 m x 5 m x 5 m	Lode and lithology	Lodes: 2D OK Accumulation Halo: 3D Au OK		90 - 460 m g/t 1-170 g/t Au

Mineral resource	Search distances*	Min, max samples	Parent cell sizes (X, Y, Z)	Domains	Estimator	Sample types	Top cuts**
						Surface RC, surface core; underground core and faces	
Sheba	100 m x 25 m x 25 m (Sheba South lode) 208 m x 153 m x 64 m (Easterly)	5, 12 (Westerly) 8, 30 (Easterly)	20 m x 20 m x 20 m 10 m x 10 m x 10 m 5 m x 5 m x 5 m	Lode and lithology	Lodes: 2D OK Accumulation Easterlies: Localised SMU CS Au	Surface and underground core and faces	Westerly: 25 -330 m g/t Easterly: 25-500 g/t Au
Upper NH & Upper Genesis	60 m x 20 m x 10 m (Westerly) 60 m x 40 m x 5 m (Easterly)	6, 12 (Westerly) 10, 20 (Easterly)	20 m x 2 0 m x 10 m 10 m x 10 m x 10 m 5 m x 5 m x 5 m	Lode and lithology	Lodes: 2D OK Accumulation Easterlies: 3D OK Au	Surface and underground core	15 -160 m g/t (Westerly) 5-100 g/t Au (Easterly)
GE200	130 m x 40 m x 7 m	25, 40	10 m x 10 m x 5 m	Lode	Pseudo 2D SK Au	Surface and underground core	25 g/t Au
Himitsu	50 m x 30 m x 30 m	3, 10	10 m x 10 m x 10 m	Lode and lithology	Lodes:2D OK Accumulation Halo: 3D OK Au	Surface RC, surface core, underground core and faces	22 to 100 m g/t
Hidden Secret, Glasgow Lass, & Dobra Serica	180 m x 72 m x 30 m	8, 30	5 m x 5 m x 5 m	Lithology & weathering	Localised SMU Au	Surface RC and surface core	20 to 250 g/t Au
Leviathan North	50 m x 25 m x 10 m (Steep) 50 m x 25 m x 8 m (Flat)	10, 21 (Steep) 12, 21 (Flat)	20 m x 20 m x 5 m 10 m x 10 m x 5 m	Lode, lithology & weathering	3D OK Au	Mainly surface RC some core	30 g/t Au

Notes: * Based on variogram model and lode orientation, varies by domain/lode. The search distances for only the primary lode are shown in the table.
** Based on statistical analysis by domain/lode, varies by domain/lode. The range of top cuts is shown in the table.
GM Based on 2D accumulation
CS Localized Conditional Simulation
Pseudo 2D – 1m composites are flattened to the mid-plane of the lode, estimation is carried out in flattened space and then returned to 3D

Source: Source: Agnew CPR, 2021

Search ellipsoids are oriented preferentially to the orientation of the principal controlling feature in each lode. A multiple pass approach is used for grade interpolation within the estimation domains. The first pass uses the optimized search parameters for the lode at the nominal drill spacing as summarized in Table 11.1.3.

With each subsequent pass, the minimum number of samples is reduced and the search volume is increased. This approach enables most blocks to receive a grade estimate within the domains. Octant searches are applied in some areas adjacent to underground development to mitigate sample clustering within the development.

Grades are estimated into block sizes (parent cells) optimized with respect to the nominal drill spacing. Dimensions of the parent cells are typically half to one quarter of the distance between drill holes at the nominal drill spacing. The parent cells are sub-celled to represent the volume within the domain. Different parent cell sizes are used in a model where there are distinct areas with different drill spacings. Parent cell sizes for the different models are presented in Table 11.1.3.

Any model cells unsupported by data beyond the ranges of the variogram/search ellipse are not included in the Mineral resource estimate.

The Qualified person's opinion is that the respective geostatistical estimation methods and the corresponding input parameters are adequate to minimize uncertainty and to derive appropriate resource block models for use by the planning engineers, the inherent uncertainties relating to the Mineral resource are as documented under resource classification (Section 11.1.11).

11.1.8 Selective mining units

The selective mining unit (SMU) size (i.e., the smallest practical volume of material on which ore and waste classification is determined) in open pits is currently assessed at 5 m x 5 m x 5 m (length, width, height). Selectivity for underground operations varies from 5 m x 5 m x 5 m to 10 m x 10 m x 10 m depending on the mining approach. Where there is sufficient data density, estimation is carried out directly to selective mining unit SMU sized blocks.

11.1.9 Model validation

Visual inspection and documented model reconciliation reviews/reporting are the main validation procedures employed. This includes a review of sections and plans where models are checked for proper coding of drill hole intervals and block model cells. Interpolated grades are examined relative to drill hole composite values.

Other model validation checks carried out include:

- Comparative statistics.
- Global bias and local trends in the estimate.
- Comparative checks of grades between other interpolation methods.
- Swath plots.
- Global change of support.

Agnew also has an extensive and proactive grade control and reconciliation process to review operational planning against actual performance. Model parameters and interpolation approaches are reviewed and adjusted as a continuous improvement process to improve reconciliation performance over time.

The 2021 mine call factor over a three-month moving average ranged between 97 % and 122 % on a month-by-month basis. The average mine call factor for 2021 was 98 % for the year. The mine reconciliation gold figure was 109 % for 2021 with the grade recorded at 88 % and the tonnage at 112 %.

11.1.10 Cut-off grades

Cut-off grades are influenced by the operating strategy, modifying factors, design and scheduling and certain costs including the ore / waste cost differential, and are therefore calculated annually in alignment with the Gold Fields cut-off grade guideline.

Open pit

The cut-off grades for the open pit Mineral resources by deposit are summarized in Table 11.1.4.

Table 11.1.4: Agnew open pit resource cut-off grades

Open pits	Resource cut-off grade (g/t Au) RoM
Leviathan North	0.78
Maria	0.77
Claudius	0.93
450 South	0.79
Barren Lands	0.76
Hidden Secret Complex	0.78
Redeemer North & South	0.82
Cams	0.90
Cinderella	0.82

Source: Agnew COG Report, 2021

The open pit resources are constrained to an optimal shell defined by a resource gold price of $1,500/oz and relevant unit costs and modifying factors. Optimization of the resource pit shell is carried out using Geovia Whittle software. The cut-off grade is calculated for the material within the pit shell using the following formula:

$$\frac{\text{[Ore Premium Mining Costs (\$/t) + Process Costs (\$/t) + Site G\&A Costs (\$/t)]}}{\text{[Price x (100 \% - Ad valorem Royalty Rate) – All product related costs] x PRF x MCF x 0.03215075}}$$

Where:

- Ore Premium Mining Costs cover adjustments in ore haulage distances and differences in ore and waste drill and blast costs. All other mining costs are accounted for during the pit shell generation phase.
- Process Costs including sustaining capital.
- Site G&A Costs including off-site general, and administration (G&A) costs directly related to site (e.g., accounting or payroll services).
- Price is the gold price per ounce ($1,500/oz).
- The ad valorem Royalty Rate is 2.5 %.
- All product related costs include management fees, refining costs and contributions to the Gold Fields Foundation per ounce.
- PRF is the plant recovery factor or metallurgical recovery as a percentage estimated at a grade close to the cut-off grade.
- MCF is the mine call factor or the percentage of actual mill produced metal against the claim of metal produced.
- 0.03215075 is the ratio of troy ounces per gram.

All material within the pit shell above the calculated cut-off grade is judged to have reasonable prospects for economic extraction.

Underground

The cut-off grades for the underground Mineral resources at Waroonga, New Holland and Redeemer by deposit are summarized in Table 11.1.5.

Table 11.1.5: Agnew underground resource cut-off grades

Area		Resource cut-off grade (g/t Au) RoM	Minimum mining width (m)
Waroonga underground	Kim South - Upper	3.12	3.0
	Kim South - Lower	4.07	3.0
	FBH - Upper	3.42	3.0
	FBH - Mid	3.35	3.0
	FBH - Lower	3.34	3.0
	Main / Main South / Rajah	3.89	3.0
	Waroonga North	3.78	3.0
	Kath Lower	3.33	3.0
	Kath Upper	3.12	3.0
New Holland and Redeemer underground	Genesis	2.37	3.0
	GE200	2.66	3.0
	New Holland	2.66	3.0
	Sheba	2.32	4.0
	Cinderella	2.68	3.0
	Himitsu	2.28	3.0
	Hidden Secret	2.15	10.0

	Redeemer Zone 2	2.52	3.0
	Redeemer North	2.95	3.0
	Barren Lands	2.73	2.0
	Claudius	3.11	3.5
	Maria	2.58	2.7

Source: Agnew COG Report, 2021

The underground Mineral resource estimates are evaluated using the same formula and gold price of $1,500/oz.

$$\frac{\text{[Mining Costs (\$/t) + Process Costs (\$/t) + Site G\&A Costs (\$/t)]}}{\text{[Price x (100 \% - Ad valorem Royalty Rate) – All product related costs] x PRF x MCF x 0.03215075}}$$

Where: Mining Costs take account the mining method and area being mined inclusive of secondary development and sustaining capital.

The cut-off grade is applied to the deposit model as part of the assessment in relation to minimum mining width and realistic prospects of extraction.

Minimum mining width and realistic extraction are assessed using a mineable shape optimizer (MSO) routine available in Datamine Studio RM® software. This routine generates a series of shapes that relate to a nominated selective mining unit SMU and a minimum width to maintain an average grade within the shape that is above the nominated cut-off grade. The selective mining unit SMU and minimum mining width are specified in line with current mining practices at Agnew.

A footprint for each orebody is initially assessed at a sensitivity cut-off grade generated using plus 25 % resource gold price (~$1850/oz). MSO shapes generated at cut-off grades for the resource case (gold price $1500/oz) are removed where they are judged to be outside the initial footprint, too isolated and unlikely to be eventually economically extracted. This leaves a contiguous set of shapes. Small amounts of material below cut-off within the boundaries of the contiguous set of shapes are evaluated to determine if they would be extracted as part of a mining sequence.

When close to existing mining areas, a further assessment is made to ensure that material is potentially extractable. Remnant mining areas are coded using a stand-off distance to existing stopes. Mineralisation inside the stand-off zones is not reported as a Mineral resource except where an engineering assessment has resulted in the design and potential extraction of planned stopes.

All material within the retained MSO shapes above the calculated cut-off grade is judged to have reasonable prospects for economic extraction and may practically include some material below the cut-off grade that is extracted as part of the mine design and sequence to mine the higher grade (above cut-off) material.

Gold Fields conducts an annual review of metal prices for Mineral resource and Mineral reserve reporting to monitor any significant changes that would warrant re-calibrating the price deck for strategic and business planning purposes. This review takes into account prevailing economic, commodity price and exchange rate trends, together with market consensus forecasts, including from global industry analysts and financial institutions, as well as Gold Fields' strategy and expectations for the mine operations.

The Mineral resource and Mineral reserve gold prices have been selected and justified by the Qualified person at $1,500/oz per troy ounce (oz) for resource and at $1,300 per troy ounce (oz) for reserve (life of mine planning and reserve techno-economic modelling). This metal price deck has also been reviewed and endorsed by the Company executive team. For more information on the rationale applied to deriving the Mineral resource and Mineral reserve metal price deck refer to chapter 16.

The selected resource gold price of $1,500/oz is at a 15 % premium to the reserve price with the differential being in general alignment with Gold Fields standard practice for setting the Mineral resource price. The 15 % premium on resources is to provide useful information on the sites resource potential and its impact at higher gold prices and to indicate possible future site infrastructure, permitting, licencing, mining footprint and tailings and waste storage

requirements. This information is important to determine the Reasonable prospects of economic extraction for the Mineral resources.

The Qualified person has concluded that reasonable prospects for economic extraction have been demonstrated through the application of an appropriate level of consideration of the potential viability of the Mineral resources. These considerations include a reasoned assessment of the geological, engineering (including mining and processing parameters), metallurgical, legal, infrastructural, environmental, marketing, socio-political and economic assumptions which, in the opinion of the Qualified person, are likely to influence the prospect of economic extraction.

Although all permitting may not be finalised for some Mineral resources, there is no reason to expect that these permits will not be granted based on existing processes and protocols.

11.1.11 Classification criteria

Agnew's in-situ Mineral resources are classified as either measured, indicated or inferred in accordance with the definitions in Subpart 229.1300 of Regulation S-K.

Increasing levels of geoscientific knowledge and confidence are generally based on geological understanding, grade continuity, drill hole/sample spacing, sample data quality, estimation quality, physical characteristics, mining development (i.e., amount of exposed and mapped mineralisation) and mining history. The Measured category also requires adjacent face sampling and mapping.

Sample spacing at Agnew varies depending on the geological complexity of the deposit and mining history. In general, and depending on the geology of the deposit, indicated Mineral resources are considered for nominal drill grid spacings between 20 m x 20 m and 40 m x 40 m and inferred Mineral resources are considered for nominal drill grid spacings between 40 m x 40 m and 80 m x 80 m or greater. Measured Mineral resources are considered for nominal 10 m x 5 m or 10 m x 10 m spacings in open pits and are generally developed along strike on 20 m x 25 m spaced levels underground.

Agnew's surface resources are comprised of stockpiles. Stockpiles are managed and monitored when mining occurs and are supported by adequate sampling, surveying and end of month reconciliation and are thus classified as measured Mineral resources.

The resource classification and nominal drill spacing resource area are summarized in Table 11.1.6.

Table 11.1.6: Agnew resource classification criteria by area

Mineral resource	Mineral resource category	Nominal drill hole grid spacing range length (m) x width (m)	Geological setting and mineralisation style
Claudius	Inferred Indicated	40 m x 40 m to 80 m x 80 m 20 m x 20 m to 40 m x 40 m	Claudius Basalt host rock associated with and Ultramafic contact, gold mineralisation associated with magnetite, biotite, epidote and chlorite alteration.
Maria	Inferred Indicated	40 m x 40 m to 80 m x 80 m 20 m x 20 m to 40 m x 40 m	Mt White Syncline conglomerates host rock, gold mineralisation associated with shear zone and quartz veins.
Cams	Inferred	20 m x 20 m	Cams gabbro and mafics host rock, gold mineralisation associated with quartz veining, shears and felsic porphyry intrusions. Cams resource is considered Inferred due to uncertainty in the current geological interpretation.
Redeemer Zone 2	Inferred Indicated	60 m x 60 m to 80 m x 80 m 20 m x 20 m to 60 m x 60 m	Scotty Creek pebbly sandstones host rock, gold mineralisation associated with quartz veins.
Redeemer North	Inferred Indicated	40 m x 40 m to 80 m x 80 m 20 m x 20 m to 40 m x 40 m	Redeemer Basalt and Mine Corridor Conglomerate host rock, gold mineralisation associated with biotite-actinolite alteration and microshears.
Barren Lands	Inferred Indicated	40 m x 40 m to 80 m x 80 m 20 m x 20 m to 40 m x 40 m	Scotty Creek pebbly sandstones/siltstones host rock, gold mineralisation associated with quartz veins.
450 South	Inferred Indicated	40 m x 40 m to 80 m x 80 m 20 m x 20 m to 40 m x 40 m	Waroonga Mine Corridor Conglomerate host rock, gold mineralisation associated with extensional shears and shear-related quartz veins, amphibole alteration.
Kim	Inferred Indicated Measured	40 m x 40 m to 80 m x 80 m 20 m x 20 m to 40 m x 40 m 20 m x 20 m	Waroonga Mine Corridor Conglomerate host rock, gold mineralisation associated with extensional shears and shear-related quartz veins.
FBH	Inferred Indicated	40 m x 40 m to 80 m x 80 m 20 m x 20 m to 40 m x 40 m	Waroonga Mine Corridor Conglomerate host rock, gold mineralisation associated with extensional shears and shear-related quartz veins.
Kath	Inferred	40 m x 40 m to 80 m x 80 m	

Mineral resource	Mineral resource category	Nominal drill hole grid spacing range length (m) x width (m)	Geological setting and mineralisation style
	Indicated	20 m x 20 m to 40 m x 40 m	Waroonga Mine Corridor Conglomerate host rock, gold mineralisation associated with extensional shears and shear-related quartz veins ±10 m from the mid-plane of the Kim Fault is Inferred due to uncertainty in the continuity of the lode through the fault.
Waroonga North	Inferred	40 m x 40 m to 80 m x 80 m	Waroonga Mine Corridor Conglomerate host rock, gold mineralisation associated with extensional shears and shear-related quartz veins, amphibole alteration.
	Indicated	20 m x 20 m to 40 m x 40 m	
Main North Main South Rajah	Inferred	40 m x 40 m to 80 m x 80 m	Waroonga Mine Corridor Conglomerate host rock, gold mineralisation associated with extensional shears and shear-related quartz veins.
	Indicated	20 m x 20 m to 40 m x 40 m	
Lower Genesis (LGX)	Inferred	40 m x 40 m	Scotty Creek sandstones/siltstones host rock, gold mineralisation associated with 500 series (depleted), westerlies style quartz veins.
	Indicated	20 m x 20 m	
	Measured	10 m x 10 m with ore development	
	Inferred	10 m x 10 m to 20 m x 20 m	Scotty Creek sandstones/siltstones host rock, gold mineralisation associated with easterlies style short scale quartz veins.
	Indicated	5 m x 5 m to 10 m x 10 m	
Cinderella	Inferred	20 m x 20 m to 40 m x 40 m	Scotty Creek sandstones/siltstones host rock, gold mineralisation associated with westerlies style quartz veins (depleted) with short scale wing veins.
	Indicated	10 m x 10 m to 20 m x 20 m	
Sheba	Inferred	20 m x 20 m to 40 m x 40 m	Scotty Creek sandstones/siltstones host rock, gold mineralisation associated with westerlies style quartz veins.
	Indicated	10 m by 10 m to 20 m x 20 m	
	Inferred	20 m x 20 m to 40 m x 40 m	Scotty Creek sandstones/siltstones host rock, gold mineralisation associated with easterlies style short scale quartz veins, model method suitable for bulk mining assessment.
	Indicated	10 m x 10 m to 20 m x 20 m	
Upper NH & Upper Genesis	Inferred	20 m x 20 m to 40 m x 40 m	Scotty Creek sandstones/siltstones host rock, gold mineralisation associated with westerlies style quartz veins (depleted).
	Indicated	10 m x 10 m to 20 m x 20 m	
	Inferred	10 m x 10 m to 20 m x 20 m	Scotty Creek sandstones/siltstones host rock, gold mineralisation associated with easterlies style short scale quartz veins.
	Indicated	5 m x 5 m to 10 m x 10 m	
GE200	Inferred	20 m x 20 m to 40 m x 40 m	Scotty Creek sandstones/siltstones host rock, gold mineralisation associated with westerlies style quartz veins.
	Indicated	10 m x 10 m to 20 m x 20 m	All of northern area is Inferred due to interpretation change.
Himitsu	Inferred	20 m x 20 m to 40 m x 40 m	Scotty Creek sandstones/siltstones host rock, gold mineralisation associated with westerlies style quartz veins (depleted).
	Indicated	10 m x 10 m to 20 m x 20 m	
Hidden Secret, Glasgow Lass, & Dobra Serica	Inferred	20 m x 20 m to 40 m x 40 m	Scotty Creek sandstones/siltstones host rock, gold mineralisation associated with easterlies style short scale quartz veins, model method suitable for bulk mining assessment.
	Indicated	10 mx 10 m to 20 m x 20 m	Dobra Serica area Inferred due to interpretation change and poor comparison of historic data with no QAQC to recent data with QAQC.
Leviathan North	Inferred	40 m x 40 m to 80 m x 80 m	Mt Goodes Basalt and Dolerite/Gabbro host rock, gold mineralisation associated with shears and quartz veins, overlying supergene zone.
	Indicated	20 m x 20 m to 40 m x 40 m	

Notes:
a) Geological considerations include continuity and grade
b) [2]Resource classification is based on geological continuity, grade continuity, drill hole/sample spacing, sample data quality, estimation quality, mining development (amount of exposed and mapped mineralisation) and mining history. The Measured category also requires adjacent face sampling and mapping.
c) The Qualified person is of the opinion that the estimation follows good practice and reduces estimation bias.

Source: Agnew CPR 2021

The estimation of resources for both underground and open pit operations is based on exploration and sampling information gathered through appropriate techniques, primarily from diamond drilling and RC drilling. The locations of sample points are spaced close enough to deduce or confirm geological and grade continuity. Generally, drilling is undertaken on grids, which range between 10 metres by 25 metres for measured resources and up to 40 metres by 40 metres typically for indicated resources, although this may vary depending on the continuity of the orebody. In underground operations mapping and sampling of development facies is used to supplement drilling information. Due to the variety and diversity of mineralisation at the Australian operations, sample spacing may also vary depending on each particular ore type

The Qualified person is of the opinion that:

a) Inferred Mineral resource has an even chance of converting to indicated Mineral resource with continued exploration, additional empirical data and evolving geoscientific modelling.

b) The Mineral resource demonstrates reasonable prospects for economic extraction over the indicated study time frame

c) The Mineral resource gold price of $1,500/oz is at a 15 % premium to the reserve price with the differential being in general alignment with Gold Fields standard practice for setting Mineral resource price. The 15 % premium is to provide information on Agnew resource potential at higher gold prices and to indicate possible future site infrastructure, permitting, licencing, SLO, mining footprint and infrastructure requirements.

d) The Qualified person's opinion is that, whilst effort and care are taken with the resource estimation and classification processes, increase in geological knowledge and available data will reduce the level of uncertainty, and therefore some inherent uncertainty will remain.

11.2 Mineral resources as of 31 December 2021

The Agnew Mineral resources exclusive of Mineral reserves as of 31 December 2021 are summarized in Table 11.2.1. The Mineral resources are 100 % attributable to Gold Fields and are net of production depletion up to 31 December 2021. The point of reference for the Mineral resources is in-situ with dilution applied to the mine shape optimizer or MSO.

Table 11.2.1: Agnew - summary of gold Mineral resources at the end of the fiscal year ended 31 December 2021 based on a gold price of $1,500/oz

	Mineral resources (exclusive of Mineral reserves)			Cut-off Grades (g/t Au)	Metallurgical Recovery (%)
	Amount/ (kt)	Grades/ (g/t Au)	Amount/ (koz Au)		
Underground Mineral resources					
UG Measured Mineral resources	107	5.8	20	2.15 to 4.07	94.04
UG Indicated Mineral resources	6,114	5.3	1,043	2.15 to 4.07	94.04
UG Measured + Indicated Mineral resources	6,221	5.3	1,063	2.15 to 4.07	94.04
UG Inferred Mineral resources	6,888	4.6	1,027	2.15 to 4.07	
Open pit Mineral resources					
OP Measured Mineral resources					
OP Indicated Mineral resources	1,980	2.7	173	0.76 to 0.93	94.99
OP Measured + Indicated Mineral resources	1,980	2.7	173	0.76 to 0.93	94.99
OP Inferred Mineral resources	751	3.5	86	0.76 to 0.93	93.44
Stockpile Mineral resources					
SP Measured Mineral resources					
SP Indicated Mineral resources					
SP Measured + Indicated Mineral resources					
SP Inferred Mineral resources					
Total Agnew Mineral resources					
Total Measured Mineral resources	107	5.8	20		
Total Indicated Mineral resources	8,093	4.7	1,216		
Total Measured + Indicated Mineral resources	8,200	4.7	1,236		
Total Inferred Mineral resources	7,639	4.5	1,112		

Notes:
a) Rounding of figures may result in minor computational discrepancies.
b) Mineral resources are exclusive of Mineral reserves.
c) No year-on-year Mineral resource comparison is presented as Agnew did not disclose a Mineral resource in 2020.
d) Quoted as diluted in situ metric tonnes and grades. Metallurgical recovery factors have not been applied to the Mineral resource estimates. The approximate metallurgical recovery factor is 94.04 % for underground. The metallurgical recovery is the ratio, expressed as a percentage, of the mass of the specific mineral product recovered from ore treated at the process plant to its total specific mineral content before treatment. Agnew mining operations vary according to the mix of the source material (e.g., oxide, transitional, fresh and ore type blend).
e) The metal prices used for the 2021 Mineral resources are based on a gold price of $1,500 per ounce or A$2,000 per ounce (at an exchange rate of A$1:$0.75). Open pit Mineral resources at the Australian operations are based on revenue factor 1 pits and the underground Mineral resources on appropriate mine design and extraction schedules. The gold price used for Mineral resources approximates 15 % higher than the selected Mineral reserve.
f) The cut-off grade may vary per shaft, open pit or underground mine, depending on the respective costs, depletion schedule, ore type, expected mining dilution and expected mining recovery. The average or range of cut-off grade values applied to the Mineral resources are: Agnew 2.15 g/t to 4.07 g/t Au mill feed (underground) and 0.76 g/t to 0.93 g/t Au mill feed (open pit).
g) The Mineral resources are based on initial assessments at the resource gold price of $1,500/oz and consider estimates of all Agnew costs, the impact of modifying factors such as mining dilution and mining recovery, processing recovery and royalties. Mineral resources are also tested through the application of Environmental, Social and Governance (ESG) criteria to demonstrate reasonable prospects for economic extraction.
h) The Mineral resources are estimated at a point in time and can be affected by changes in the gold price, US Dollar currency exchange rates, permitting, legislation, costs and operating parameters.

Source: Agnew CPR 2021

The Mineral resources are based on initial assessments at the resource gold price of $1,500/oz and consider estimates of all Agnew costs, the impact of modifying factors such as mining dilution and recovery, processing recovery and royalties to demonstrate reasonable prospects for economic extraction.

11.3 Audits and reviews

The 31 December 2020 Mineral resource estimate was externally audited by external and independent consultant Optiro, who concluded that the Mineral resource was generated, classified and reported to the appropriate technical standard with no material areas of non-compliance identified. The best practices employed were carried over into the 31 December 2021 estimate. External Mineral resource and reserve audits are performed on a rolling three-year cycle.

The Mineral resource estimate was also subjected to internal review and scrutiny by the relevant Qualified persons and regional technical and financial disciplines, and peer reviewed for technical assurance and compliance in reporting by Gold Fields' Corporate Technical Services (CTS), Sustainable Development and Head Office Finance teams.

The Mineral resource estimate is underpinned by appropriate Mineral resource management processes and protocols to ensure requisite corporate governance in respect of the intent of the Sarbanes-Oxley Act of 2002 (SOX). Technical and operating procedures developed for Agnew are designed to be compliant with the SOX framework and risk assessment control matrix (RACM) as adopted by Gold Fields for Mineral resource and Mineral reserve estimation, reporting and auditing.

Gold Fields uses K2Fly RCubed® propriety software in combination with SharePoint® to ensure accuracy, governance, auditability and security in the reporting of Mineral resources and Mineral reserves.

11.4 Comparison with 31 December 2020 Mineral resource

No Resources were disclosed in 2020

Resources have not been reported on this stock exchange previously, however, in the Qualified persons opinion the 2021 to 2020 resource comparison changes are not material.

12 Mineral reserve estimates

12.1 Level of assessment

Agnew's Mineral reserves are that portion of the Mineral resources which, as technical and economic studies have demonstrated, can justify extraction as at 31 December 2021.

The Mineral reserves are based on appropriately detailed and engineered life of mine plans and are supported by relevant studies completed to a minimum pre-feasibility study level. The life of mine plans are based on measured and indicated Mineral resources converted through the application of appropriate modifying factors to derive Mineral reserves estimates

A pre-feasibility study has an estimated accuracy for operating and capital costs of ±25 % with a contingency of no more than 15 %.

All mine design and scheduling is completed by experienced engineers using appropriate mine planning software and incorporates relevant modifying factors, cut-off grades and the results from other techno-economic investigations.

Mining rates, fleet productivities, operational and plant capacities and constraints are accounted for in the plan and are typically based on historical performance trends. All geotechnical protocols and constraints are accounted for in the plan, including the provision for suitable mining geometries, mining losses, mining recovery and dilution. Provision is also made for sufficient waste rock and tailings storage with plans in place to meet the life of mine requirements. The Company's mine closure plans comply with in-country legal requirements and are approved by the regulator. Integrated mine closure plans provide appropriate cost parameters for operational and life of mine planning as well as end of life mine closure commitments.

The Mineral reserve includes "incrementally costed" material to ensure the Agnew processing facility is operating at full capacity for the full life of the operation. The mining of this material covers the full cost of mining, variable costs of processing, administration, closure and rehabilitation, and positively contributes to covering fixed site overhead costs. The inclusion of incrementally costed material within the mine plan is viable at Agnew based on the following assumptions:

- The operation is mine constrained.
- The mining of incremental material does not extend the life of the overall operation.
- New projects will not be delayed due to lack of processing feed and capacity.
- Analysis has been completed to understand the nature of the fixed and variable costs of processing.
- Analysis has been completed that shows the positive cashflow contribution for this reserve.
- Time-based economics have been undertaken to show the positive NPV contribution.

The point of reference for the Mineral reserves is ore delivered to the processing facility, also known as the run-of-mine or RoM.

The Qualified person's opinion of the 2021 Mineral reserve estimates is:

(a) The modifying factors are based on recent mining and processing extraction history and performance and are reasonable and appropriate to derive the reserves from the resources and minimize any estimation errors. The modifying factors are aligned with leading industry technical practice, for example, blended process recovery is used in the reserve estimate.

(b) Agnew has grown its Mineral reserves over the past three reporting cycles net of depletion. Infrastructure, environmental, permitting, closure, utilities and baseline studies are all aligned to support continued Mineral reserves growth. Agnew's proactive study pipeline retains a focus on progressing all key work integral to supporting ongoing life of mine extensions so as to avoid any potential production delays. For example, a study has been commissioned to extend tailings storage capacity in TSF 4.

(c) The indicated and measured Mineral resource is sufficient in geoscientific confidence to complete final life of mine designs. However, it is usual to complete a final phase of infill drilling to determine a high confidence 'mine defined' resource with detailed geoscientific information prior to final stope design, pillar layouts and detailed production scheduling.

(d) The reported reserve is a 'point in time' or snapshot of the life of mine plan as at 31 December 2021. It is supported by a technically valid and economically viable mine design and schedule combining open pits and three underground mines. The techno-economic work does not exceed the estimated accuracy of ±25 % and or require more than 15 % contingency for both operating and capital costs.

(e) Environmental compliance and permitting requirements have been assessed in detail with supporting baseline studies and relevant preliminary internal impact assessments completed. In addition, detailed tailings deposition, waste disposal, reclamation, and mine closure plans are incorporated into the life of mine plan.

(f) The life of mine plan is completed to a minimum pre-feasibility level of study, although certain components of the plan have been completed to a feasibility level of study.

12.2 Mineral reserve estimation criteria

12.2.1 Recent mine performance

Agnew's recent underground performance is summarized in Table 12.2.1. There has been no open pit mining at Agnew since 2012.

Table 12.2.1: Agnew – recent operating statistics

		Units	2021	2020	2019
Waroonga	Ore development	m	2,339	2,649	2,620
	Waste development	m	7,602	5,188	4,890
	RoM ore mined	kt	754	774	728
New Holland	Ore development	m	1,695	1,824	2,025
	Waste development	m	2,335	3,265	3,491
	RoM ore mined	kt	374	530	555
Total Agnew (mined)	Ore development	m	4,034	4,473	4,645
	Waste development	m	9,938	8,454	8,381
	Waste mined	kt	893	753	768
	Waste mined – operating	kt	236	258	236
	Waste mined – capital	kt	657	495	442
	RoM ore mined	kt	1,128	1,304	1,283
Processing	Tonnes milled	kt	1,254	1,357	1,231
	Grade milled	g/t Au	5.5	5.3	5.5
	Processing recovery	%	95.0	94.6	94.2
	Gold produced	koz	223	233	219
		kg	6,936	7,256	6,824
Financials	Average gold price received	$/oz	1,802	1,762	1,387
	Exchange rate annual average	$/A$	0.75	0.69	0.70
	Cash cost of sales before amortisation and depreciation	$/oz	774	993	1,045
	Capital expenditure	$ million	88	52	76
		$/oz	395	223	349
	All in Cost (AIC)	$/oz	1308	1,053	1,152

Notes: a) The operating statistics are based on annual fiscal year measurements

Source: Agnew CPR 2021

12.2.2 Key assumptions and parameters

The assumptions and parameters considered in the Mineral reserve estimate are summarized in Table 12.2.2.

Table 12.2.2: Agnew – Summary of material modifying factors

		Units	2021	2020	2019
Mineral resource modifying factors	Mineral resource gold price	$/oz	1,500	1,500	1,400
	Exchange rate annual average	$/A$	0.75	0.75	0.76
	Cut-off grade range - underground resources	g/t Au	2.2 – 4.1	2.3 – 3.9	2.5 – 3.8
	Cut-off grade range - open pit resources	g/t Au	0.76 – 0.93	0.77 – 0.95	0.83 – 0.95
Mineral reserve modifying factors	Mineral reserve gold price	$/oz	1,300	1,300	1,200
	Exchange rate annual average	$/A$	0.74	0.74	0.75
	Processing capacity	Mtpa	1.3	1.3	1.3
	Cut-off grade range - underground reserves	g/t Au	2.6 – 4.6	2.6 – 4.4	2.85 – 4.4
	Cut-off grade range - open pit reserves	g/t Au	0.85 – 1.04	0.77 – 0.95	0.83 – 0.95
	Mining dilution - underground	%	13 – 30	14 – 29	24
	Mining dilution - open pit	%	11 – 55	2 – 39	24
	Mining recovery underground	%	70 – 93	70 – 93	80 – 95
	Mining recovery open pit	%	72 – 88	87 – 96	83
	Mine Call Factor (MCF)	%	100	100	100
	Process plant recovery factor	%	93.4	93.3	93.3

Notes:
b) The 2021 fiscal modifying factors are valid as at 31 December 2021
c) The cut-off grades are the lowest grade of mineralized rock which determines as to whether it is economic to recover its gold content by further concentration, calculated as per the Gold Fields cut-off grade guidance on methodology and protocol; see Section 11.1.10 for more information on cut-off grade calculation methodology
d) The metal prices selected are the same for the past two annual reserve and resource estimates
e) Relevant modifying factors are reported in ranges and vary based on open pit and underground extraction and estimated unit costs for depth and distance hauled

Source: Agnew CPR 2021

Operating expenditures comprise:

- Cash Cost Components: these include direct mining costs, direct processing costs, direct G&A (general and administration) costs, consulting fees, management fees, transportation and realization charges.
- Total Cash Costs: these include additional components such as royalties (excluding taxes where appropriate).
- Total Working Costs: these include terminal separation liabilities, reclamation and mine closure costs (the net difference between the total environmental liability and the current trust fund provision) but exclude the salvage value on closure and non-cash items such as depreciation and amortization.
- Total Costs: these include total working costs plus net movement in working capital plus capital expenditure.
- Major Capital Projects: In addition to long-term capital projects, the life of mine capital expenditure programmes generally include detail based on approved expenditure programmes.

Mining costs are underground mining costs and surface sources costs, including ore handling costs. Mining costs are based on unit rates for the preceding 6 to 12 months actual snapshot, applied to the planned physicals, with alignment to the key cost centres driving the operating costs.

Processing costs include tailings and waste disposal costs, as well as the cost of maintaining key on-mine infrastructure.

G&A costs are largely based on the required and necessary technical and administrative support services required to sustain current and future mining production. In most instances these are assigned with fixed and variable cost components per tonne of ore within both the reserve estimation and corresponding financial models. Corporate costs are assigned as variable with ounces sold in the financial model.

Table 12.2.3: Agnew Unit cost

Input Variable		Units	Waroonga	New Holland
Mass- Troy Ounces to Grams		g/oz	31.1035	31.1035
Exchange Rate - AUD to USD		AUD/USD	0.74	0.74
Reserve Gold Price	USD	USD/oz	1300	1300
	AUD	AUD/oz	1750	1750
WA State Govt Royalty		%	2.5	2.5
Reserve Realised Gold Price		$/oz	1,262.66	1,262.66
On Site Administration	Variable Costs	$/ t ore	10.0	10.0
	Costs	$/ t ore	9.5	9.5
Processing	Variable Cost	$/ t ore	20.8	20.8
	Total Cost	$/ t ore	20.8	20.8
	Sustaining Capital and TSF	$/ t ore	0.5	1.6
	Total Cost including Sustaining Capital	$/ t ore	21.4	22.5
	Infrastructure Capital Costs (Project)	$/ t ore	9.3	3.1
Surface Cartage Cost Mine to Mill		$/ t ore	3.7	4.3
Mining Overhead	Variable Cost	$/ t rock	16.7	19.1
	Cost Total	$/ t rock	16.7	19.1
Lateral Development	Cost per metre - High	$/ m adv	5,838	2,791
	Cost per metre - Low	$/ m adv	2,833	1,745
Vertical Development	Cost per metre - Average	$/ m adv	4,182	4,182
Production	Drilling	stope t/drill m	3.1	4.4
	Drilling 89 mm Holes	$/ prod drill m	49.5	35.6
	Blasting	$/ t stope ore	4.9	4.1
Stope Bogging - Remote		$/ t stope ore	5.8	7.8
Stope Cable Bolting		$/ m cable bolt		
Backfill		$/ m^3	40.6	49.3
Haulage		$/ tkm	1.8	1.0
Operating Diamond Drill Cost per metre		$/ diamond drill m	120.3	118.9
Mining Sustaining Capital		$/ t ore	5.1	2.6
Mining Infrastructure Capital Costs		$/ t ore	1.1	0.2
Site Infrastructure Capital Costs		$/ t ore	1.6	1.8
Leasing Liability	PROCESSING	$/ t ore	2.1	2.1
	PROCESSING 50 %	$/ t ore	1.0	1.0
	NEW HOLLAND	$/ t ore	1.7	1.7
	WAROONGA	$/ t ore	2.4	2.4
	TOTAL	$/ t ore	6.1	6.2

Source: Agnew CPR 2021

The terminal benefits liabilities are not included in overhead costs as per Company policy and directives. Rehabilitation and appropriate mine closure costs are included following completion of mining.

Capital expenditure estimates beyond the next two years are based on pre-feasibility estimates for infrastructure and development requirements for individual projects, and unit-rate average historical costs where applicable. A pre-feasibility study has an estimated accuracy for operating and capital costs of ± 25 % with a contingency of no more than 15 %.

Details of the forecast operating, and capital expenditures are provided in Section 18.

As disclosed in Section 11.1.10, Gold Fields conducts an annual review of metal prices for Mineral resource and Mineral reserve reporting to monitor any significant changes that would warrant re-calibrating the price deck for strategic, business or life of mine planning purposes. This review considers prevailing economic, commodity price and

exchange rate trends, together with market consensus forecasts and Gold Fields' strategy and expectations for the mine operations.

The Mineral reserve gold price of $1,300/oz is detailed in particularity in Chapter 16 Marketing.

The Qualified person is of the opinion that the gold price applied to the estimation of the Mineral reserves is reasonable and suitable for life of mine planning and is an appropriate reflection of recent historical trends and importantly provides a metal price that mitigates the risk of short to medium term price fluctuations with the potential to impact on the execution of the life of mine reserve plans. The gold price used provides a reasonable long-term delta to current spot prices and incorporates into the life of mine plan appropriate contingency to offset possible short term lower price cycles.

For the operating mines, 6 to 18 month trailing average actual costs form the basis of the unit rates applied to the reserve financial model, with consideration for expected variations in operating and capital costs. This timeframe is selected based on alignment with recent business planning data. For new mines, costs are based on estimates from a range of recent sources and are deemed appropriate and representative by the Qualified person.

The Mineral reserve estimates may be materially affected based on changes to the cost and price assumptions, in addition to changes in the modifying factors. The reserve is assessed at multiple scales, including individual stope or pit, level, orebody, mine, and operation. As such, the Qualified person is of the opinion that the reserve plan should be viewed as a consolidated entity, as removal of key components of the reserve may have a material and disproportionate impact on the overall value and viability of the plan.

In addition to changes to modifying factors, additional data acquired into the future may materially impact the reserve estimate. Examples include, but are not limited to, acquisition of additional drilling data, changes to interpretation of the data, mining studies, internal and external approvals and operating strategies.

12.2.3 Cut-off grades

Cut-off grades are influenced by the operating strategy, cost base and design and scheduling, and are therefore calculated annually in alignment with the Gold Fields cut-off grade guideline. The purpose of the guideline is to ensure consistency in the cut-off definitions and cut-off processes across all company properties. Cut-off grades are not only calculated globally for a mining operation, but also for separate ore deposits and mining areas dependent on various factors such as ore type, mining method, haul distances, recoveries and the mining, processing and general and administration costs.

Open pit

The cut-off grades used for the open pit Mineral reserves are calculated using the same methodology described in Section 11.1.10 at the reserve gold price of $1,300/oz. The cut-off grades by deposit are summarized in Table 12.2.4.

Table 12.2.4: Agnew open pit reserve cut-off grades

Area	Reserve shell revenue factor selected	Reserve cut-off grade (g/t Au) RoM	Expected process recovery (%)
Maria South	1.3	0.88	98
450 South	1	0.85	96
Barren Lands	2	0.86	96
Hidden Secret Complex	1	0.88	96

Notes: a) The cut-offs are estimated based on the reserve price, reserve modifying factors and are not expected to change materially over the life of mine reserve
b) The cut-off grades, price and modifying factors are incorporated in the estimation of the reserve shell
c) The Qualified person is of the opinion that the design of the selected reserve shells used in the reserve estimation minimize estimation errors

Source: Agnew COG Report, 2021

Underground

The cut-off grades used for the underground Mineral reserves are calculated using the same methodology described in Section 11.1.10 at the reserve gold price of $1,300/oz. The cut-off grades by deposit are summarized in Table 12.2.5.

Table 12.2.5: Agnew underground reserve cut-off grades

Area		Reserve cut-off grade (g/t Au) RoM	Expected process recovery (%)	Minimum mining width (m)
Waroonga underground	Kim South - Lower	4.7	95	3.0
	Edmunds	3.6	96	3.0
	FBH - Upper	3.9	88	3.0
	FBH - Mid	3.8	88	3.0
	FBH - Lower	3.8	88	3.0
	Main / Main South / Rajah	4.4	86	3.0
	Waroonga North	4.3	93	3.0
	Kath Lower	3.8	93	3.0
	Kath Upper / Kath North	3.6	93	3.0
New Holland and Redeemer underground	Genesis	2.7	96	3.0
	New Holland	3.0	96	3.0
	Sheba	2.7	96	Room Pillar 4.0
	Cinderella	3.1	90	3.0
	Himitsu	2.6	96	3.0
	Redeemer Zone 2	2.9	90	3.0
	Redeemer North	3.3	89	3.0
	Barren Lands	3.1	92	2.0

Notes: a) The underground cut-offs are estimated based on the reserve price, reserve modifying factors and are not expected to change materially over the life of mine reserve
b) The estimated cut-off grades are adjusted for increased unit costs associated with mining depth and ground support type costs
c) The Qualified person is of the opinion that the life of mine schedule contains sufficient diligence to minimize estimation errors

Source: Agnew COG Report, 2021

12.2.4 Mine design

The active mining areas at Waroonga and New Holland use modern mechanized mining equipment, with long-hole drill and blast, and truck haulage via declines to surface. Waroonga is predominantly mined using open stoping with cemented paste fill. New Holland is predominantly mined using inclined room and pillar with long-hole open stoping. Both mines are operated with dedicated mining teams, under a single site management structure.

Open pit mining is planned to be by conventional drill and blast, with truck and shovel operations.

Further details on the mining methods are provided in Section 13.

Open pit

Open pit planning entails the input of economic parameters and physical constraints into mining optimization software to generate a series of nested pits from which an optimal shell is selected. Detailed design is undertaken to confirm the extraction plan for the optimal shell. The process is iterated until an acceptable level of correlation is achieved between the optimal shell and the detailed pit design.

The open pit slope parameters or wall angles are based on comprehensive assessment of all available engineering geology and geotechnical information, including weathering, rock mass strength, frequency and orientation of fracturing and rock mass characterization.

Underground

Mining access infrastructure and stoping methods are largely determined by the geometry of the mineralized zones and the evaluation involves review of more than one method to determine the preferred capital and operating expenditure schedules and optimal mining economics.

The primary technical constraints underground are the geotechnical extraction sequence, number of active work areas, ventilation and paste fill. Careful assessment of all mining rates, capacities and constraints supports the integrated scheduling of production activities to enable effective mine plan delivery. The 2021-2022 primary ventilation fan upgrades are a key enabler to ensure appropriate cooling capacity for the life of mine plan and as mining depth progresses deeper.

Currently Waroonga has four primary ventilation intakes (Main decline, Kim decline, Main and Kim fresh air rise network), and two primary exhausts (Kim and Main return air rise network). Ventilation intake and exhaust is managed to accommodate the use of truck haulage at depth. Fresh air is used to reduce the temperature of the workings.

Reserve plan ventilation requirements are reviewed using VentSim® modelling. The modelling allows for detailed designs, particularly in relation to vent raise and vent drive dimensions, with cooling capacity matched with fleet engine size. The ventilation districts change over the mine life, and this modelling assists with evolving the capacities and managing reserve scheduling based on ventilation constraints.

New Holland is physically constrained by the number of available high-grade work areas, with production focused on stoping in Sheba from 2020. Other areas of the mine are continually reviewed as incremental mining opportunities while the operation remains mine constrained due to haulage via a single decline and while there is spare mill capacity.

Currently New Holland has three intake airways (Genesis decline, New Holland decline, Genesis air rise network) and two primary exhausts (Cinderella return and Genesis 500 return air rise).

Redeemer Zone 2 and Barren Lands are new underground mines with much of the capital costs associated with the surface set-up (communications, workshop, site offices, pond, pumping, electrical) and underground infrastructure (raw water supply, dewatering, compressed air). The primary technical constraints at Redeemer Zone 2 include the potential hydraulic connection between tailings storage facility 3 and the Redeemer Zone 2 orebody. Stand-off distances from the former Redeemer mine of 130 m are currently being applied.

Primary ventilation and secondary egress to the mine will be established from surface and positioned northwest of the Redeemer waste rock dump. A fresh air raise and return air raise connected to the top of the mine will serve as the primary ventilation system. The fresh air connects to the decline and serves as the secondary egress.

12.2.5 Mine planning and schedule

The company's annual mine planning process is anchored by a corporate planning calendar that sets out the sequence of events to be followed that ensures a strong linkage between the strategic planning phase and the life of mine plan itself that defines the Mineral reserves. During the first half of the year the preferred strategic plan is confirmed and approved by the company Executive Committee. This provides guidance for required investment and business and operational planning to position the mine to deliver on the strategic intent for the property. The detailed two-year

operational plan and budget is informed by financial parameters determined by the Executive Committee and is the anchor to the longer-term planning and equates to the first two years of the life of mine plan.

The overall planning process schedules key work to be completed and stage gated before subsequent work can be continued and includes the metal prices, geology and estimation models, resource models, mine design, depletion schedules, environmental and social aspects, capital and operating costs and finally the cash flow model and financial valuation. Capital planning is formalized pursuant to Gold Fields' capital investment and approvals process.

Projects are categorized and reviewed in terms of total expenditure, return on investment, net present value (NPV) and impact on All-in Costs (AIC) per ounce and all projects involving amounts exceeding $40 million are submitted to the Board for approval. Material changes to the plans are referred back to the Executive Committee and the Board. Post-investment reviews are conducted to assess the effectiveness of the capital approvals process and to leverage continuous improvement opportunities going forward.

The Mineral reserve estimates are based on an appropriately detailed and engineered life of mine plan that is supported by relevant studies completed to a minimum PFS level of work. All design and scheduling is completed by experienced engineers using appropriate mine planning software and incorporates all relevant modifying factors, the use of cut-off grades and the results from other techno-economic investigations. Mining rates, fleet productivities and all key operational and plant capacities and constraints are accounted for in the plan and are typically based on historical performance trends. All geotechnical protocols and constraints are accounted for in the plan, including the provision for suitable mining geometries and ground support, mining losses in pillars, mining recovery and dilution. The provision of sufficient waste storage and tailings capacity is engineered into the plans to meet the life of mine requirements.

Mine planning is driven primarily by personnel at the mine who are best positioned to determine the technical and commercial objectives for the site based on the parameters, objectives and guidelines issued by the corporate office. The site-based planning is supported by regional technical services functions, as well as from corporate technical services (CTS) and the corporate finance and sustainable development teams which provide overall oversight and assurance.

Open pit

Open pit mine design and scheduling is based on 3D Mineral resource block models. The ore is assigned to selective mining unit SMU mining shapes based on equipment size and practical selectivity. The selective mining unit SMUs are accumulated into ore dig plans.

The selected pit shells are subjected to detailed mine design and extraction sequencing to optimize the waste: ore strip ratio and with benches recovering ore above the reserve cut-off grade. The access ramps are ideally placed to minimize ore loss below the ramp and can be outside the selected shell.

The open pits are sequenced to derive the best possible integrated plan and to blend feed to the plant to assist with life of mine tail end management. The open pits are mined by a single contractor.

Underground

Underground mine schedules are based on 3D block Mineral resource models (inventory models), with allowances made for minimum mining widths, dilution and ore loss appropriate to the mining method being considered and geotechnical considerations. Historical performance measures are considered in determination of these modifying factors.

Underground mining equipment availability and utilization data are collated as part of the scheduling and equipment allocation process (

Table 12.2.6). Actual and planned equipment availability ranges from 80 % to 90 % for most machinery. The required equipment utilization is generally between 60 % and 82 %. Availability and utilization are based on calendar hours.

Table 12.2.6: Agnew - Open pit and underground and mining equipment

Equipment type	Waroonga	New Holland	Redeemer and Barren Lands	Open pits
Trucks	9	3	3	4
Loaders	7	3	3	2
Blast hole drill rigs	2	2	3	2
Development drill rigs	4	2	4	NA

Notes: a) The estimated mining equipment fleet is expected to vary over the life of mine based on the open pit to underground mining ratios
b) The heavy mobile equipment fleet is renovated based on manufacturers specification or on regular maintenance records
c) The Qualified person is of the opinion that the prescribed mining fleet supports the life of mine reserve

Source: Agnew CPR 2021

A time-based economic evaluation is undertaken of the completed mining and processing schedule to ensure economic viability over the reserve life with the requisite rehabilitation and end of life mine closure costs also incorporated into the financial assessment. Provided that individual mining areas cover the direct mining costs (capital and operating), variable processing, tailings storage facilities, rehabilitation and on-site administration costs, contribute to overhead fixed costs, and do not increase the overall life of the operation (i.e., mine constrained), the material can be included in the reserve estimate.

Refer to Section 19.1 for details on the life of mine schedule.

The Qualified person is of the opinion that the mine plan and schedule incorporate appropriate assessment of all relevant technical, environmental, social and financial aspects to ensure the Mineral reserve complies with the SK rule instructions and requirements. After reasonable assessment there is no unresolved material matter that could have a significant impact on the mines ability to execute the life of mine plan. The mine plan and schedule incorporate consideration of the following key criteria:

- Production depletion up to 31 December 2021
- Application of cut-off grades to determine mineable ore
- Application of appropriate modifying factors to convert resource to reserve
- Allocation of suitable mining equipment and costs
- Incorporation of realistic mining rates and efficiencies
- Practical and realistic mine design and mining methods
- Integrated production scheduling taking account of capacities, constraints and bottlenecks
- Use of appropriate paste filling rates for stope voids
- Integrated project management and execution
- Security of water and energy for the life of mine
- Provision for mine rehabilitation and mine closure costs
- Consideration of all environmental, social and legal aspects to enable life of mine plan execution
- Appropriate life of mine tail end management
- Security of current and future land tenure and relevant leasing agreements, permits and licences
- Life of mine cash flow model and economic viability

12.2.6 Processing schedule

The processing schedule is derived from the Mineral reserve schedule. The ore is blended from the open pits and three underground mining areas. The individual ore type recovery formulas as detailed in Section 10.2 are used in the mine schedule to aggregate into an overall processing recovery.

Refer to Section 19.1 for details on the life of mine processing schedule.

12.2.7 Classification criteria

Agnew's Mineral reserves are classified as either proven or probable in accordance with the definitions in Subpart 229.1300 of Regulation S-K.

The estimation of reserves for both underground and open pit operations is based on exploration and sampling information gathered through appropriate sources, primarily from DD, RC, AC and sonic drilling techniques. The locations of sample points are spaced close enough to deduce or confirm geological and grade continuity. Generally, drilling is undertaken on grids, which range between 10 m by 25 m for proven Mineral reserves and up to 40 m by 60 m typically for probable Mineral reserves, although this may vary depending on the type and continuity of the orebody. In underground operations, mapping and sampling of development excavations where the orebody is exposed is used to supplement the initial drilling information. Where required supplementary close spaced mine definition drilling (infill) is undertaken to enable final detailed production design and extraction sequencing.

At Agnew, a proven Mineral reserve is also assigned if it is flagged as a measured Mineral resource and if the reserve block is covered by sufficient infill drill holes and/or exposed development face mapping. A probable Mineral reserve is assigned if it is flagged as an indicated Mineral resource, is only covered by exploration / resource definition drill holes and has no development face mapping.

Mineral reserve statements include only measured and indicated Mineral resources modified to produce Mineral reserves contained in the life of mine plan.

12.2.8 Economic assessment

The basis for establishing economic viability is discussed in Section 19.

12.3 Mineral reserves as of 31 December 2021

The Agnew Mineral reserves as of 31 December 2021 are summarized in Table 12.3.1. The Mineral reserves are 100 % attributable to Gold Fields and are net of production depletion up to 31 December 2021. The point of reference for the Mineral reserves is ore delivered to the processing facility.

Table 12.3.1: Agnew - summary of gold Mineral reserves at the end of the fiscal year ended 31 December 2021 based on a gold price of $1,300/oz

	Amount/ (kt)	Grades/ (g/t Au)	Amount/ (koz Au)	Cut-off Grades (g/t Au)	Metallurgical Recovery (%)
Underground Mineral reserves					
UG proven Mineral reserves	6	5.5	1	2.6 to 4.6	94.04
UG probable Mineral reserves	4,712	6.4	966	2.6 to 4.6	94.04
UG total Mineral reserves	4,718	6.4	967	2.6 to 4.6	94.04
Open pit Mineral reserves					
OP proven Mineral reserves				-	-
OP probable Mineral reserves	408	3.3	43	0.85 to 0.88	94.99
OP total Mineral reserves	408	3.3	43	0.85 to 0.88	94.99
Stockpile Mineral reserves					
SP proven Mineral reserves	13	8.0	3	0.9 – 0.99	93.44
SP probable Mineral reserves					
SP total Mineral reserves	13	8.0	3	0.9 – 0.99	93.44
Total Mineral reserves					
Total proven Mineral reserves	19	7.2	4		
Total probable Mineral reserves	5,120	6.1	1,009		
Total Agnew Mineral reserves 2021	5,138	6.1	1,013		
Total Agnew Mineral reserves 2020	5,292	5.4	917		
year-on-year difference (%)	-3%	14%	11%		

Notes:

a) Rounding of figures may result in minor computational discrepancies.

b) Refer to Table 12.5.1 for year-on--year Mineral reserve comparison.

c) Quoted as mill delivered metric tonnes and run-of-mine grades, inclusive of all mining dilutions and gold losses except metallurgical recovery. Metallurgical recovery factors have not been applied to the reserve figures. The approximate metallurgical recovery factor is 93.44 %. The metallurgical recovery is the ratio, expressed as a percentage, of the mass of the specific mineral product recovered from ore treated at the process plant to its total specific mineral content before treatment. The recoveries for Agnew vary according to the mix of the ore source material (e.g., oxide, transitional, fresh and ore type blend) and method of treatment.

d) The metal prices used for the 2021 LoM Mineral reserves are based on a gold price of $1,300 per ounce or A$1,750 per ounce (at an exchange rate of A$1:$0.74). Open pit Mineral reserves at Agnew are based on optimized pits and the underground operations on appropriate mine design and extraction schedules.

e) Dilution relates to planned and unplanned waste and/or low-grade material being mined and delivered to the process plant. Ranges are given for those operations that have multiple orebody styles and mining methodologies. The mine dilution factors range from 11 % to 55 % (open pit) and 13 % to 30 % (underground).

f) The mining recovery factor relates to the proportion or percentage of ore mined from the defined orebody at the gold price used for the declaration of Mineral reserves. This percentage will vary from mining area to mining area and reflects planned and scheduled reserves against actual tonnes, grade and metal mined, with all modifying factors, mining constraints and pillar discounts applied. The mining recovery factors range from 70 % to 93 % (underground) and 72 % to 88 % (open pit).

g) The cut-off grade may vary per open pit or underground mine, depending on the respective costs, depletion schedule, ore type, expected mining dilution and mining and metallurgical recoveries. The average or range of cut-off grade values applied in the planning process are: Agnew 2.6 g/t to 4.6 g/t Au mill feed (underground) and 0.85 g/t to 0.88 g/t Au (open pit).

h) A gold based Mine Call Factor (gold called for over gold accounted for) determined primarily on historic performance but also on realistic planned improvements where appropriate, is applied to the Mineral reserves. A Mine Call Factor of 100 % has been applied at Agnew.

i) The Mineral reserves are estimated at a point in time and can be affected by changes in the gold price, US Dollar currency exchange rates, permitting, legislation, costs and operating parameters.

j) Agnew is 100 % attributable to Gold Fields and is entitled to mine all declared material located within the property's mineral leases and all necessary statutory mining authorizations and permits are in place or have reasonable expectation of being granted.

Source: Agnew CPR, 2021

The Agnew Mineral reserves are the economically mineable part of the measured and indicated Mineral resources based on life of mine schedules and pre-feasibility studies completed at the reserve gold price of $1,300/oz to justify their economic viability at 31 December 2021 (refer to Section 19 for details on the supporting economic analysis).

12.4 Audits and reviews

Audits and reviews completed at Agnew during 2020 and 2021 included:

- Site based internal peer reviews, validation and reconciliation of geology models, geology wireframes, estimation process and outputs with senior geology staff and department heads.
- Ongoing routine drilling, sampling and geology audits and coaching of all staff by senior geologists and department heads to ensure due process and SOX risk assessment control matrix compliance.
- Corporate technical services audits and review of geology, estimation and mine planning models.
- Gold Fields' Group Geology and Planning technical team reviews and site visits for validation and compliance evaluation of resources and reserves process, protocol and output.
- ISO14001 surveillance audit by recognized external auditors.
- ISO45001 surveillance audit by recognized external auditors.
- ISO27001 certification.
- Tailings storage facilities annual dam safety inspection.
- Global Industry Standard on Tailings Management (GISTM) programme, supported by third party (CMW).
- Ongoing routine internal audits (Gold Fields' Internal Audit).
- Annual external financial audits (KPMG to 2018, PWC from 2019).
- Internal legal compliance and ethics policy review.
- Internal SOX compliance (Perth and Corporate auditors, including 2020 audits).
- External Mineral resource and Mineral reserve audit by Optiro Consulting.

No adverse findings or any non-compliances were recorded from any of the audits. Ongoing compliance with minor improvement, adjustments and best practice continue to be implemented. Records of audits are filed electronically on site in relevant departments and folders with major audit signoffs reported in the Gold Fields annual report.

12.5 Comparison with 31 December 2020 Mineral reserve

The net difference in Mineral reserves between 31 December 2020 and 31 December 2021 is +96 k oz Au or +11 % (Table 12.5.1).

Table 12.5.1: Net difference in Mineral reserves between 31 December 2020 and 31 December 2021

Proved and Probable Reserve	Unit	% Change	Gold on RoM
As at 31 December 2020	koz		917
Production depletion 2021	koz	-9 %	-227
Gold price	koz	100 %	0
Production cost	koz	279 %	-53
Discovery - Exploration	koz	37 %	211
Conversion	koz	-17 %	145
Inclusion / exclusion	koz	20 %	10
As at 31 December 2021	koz	+11 %	1,013

Notes: a) The Qualified person opinion the year-on-year reserve changes are not material
b) Data from Reserve 2020 and Reserve 2021

Source: Agnew CPR 2021

A series of overlapping internal processes exist at Gold Fields to review and validate the modifying factors, input assumptions, cut-off grades, designs, schedules, economic evaluation, and other technical assessments. These reviews include site, regional and group technical assessments, internal audits, and trained Competent Person / Qualified person authorizations. Multiple external audits of the Gold Fields reserves declarations and processes for Agnew have been completed within the past 5 years.

These processes are designed to reduce the likelihood of a significant or material error in the reserves estimation process and associated reserves declaration, although potential for error exists. The Qualified person for Reserves is not aware of any material error or omission that at the time of writing would be deemed likely to have a significant impact on the operation's ability to deliver the reserve mine plan.

13 Mining methods

The mining process and methods comprises two principal activities: (i) developing access to the orebody; and (ii) extracting the orebody once accessed. These two processes apply to both surface and underground mines.

13.1 Open pit

In open pit mining, access to the orebody is achieved by stripping the overburden in benches of fixed height to expose the ore below. This is most typically achieved by drilling and blasting an area, loading the broken rock with excavators into dump trucks and hauling the rock and/or soil to dumps. The overburden material is placed on designated waste rock dumps.

Extraction of the orebody involves a similar activity as in stripping the overburden. Lines are established on the pit floor demarcating ore from waste material and the rock is then drilled and blasted. Post blasting, the ore is loaded into dump trucks, based on a defined 'dig plan' demarcating the position of the ore and waste boundaries post the heave and throw movement caused by the blasting, and hauled to interim stockpiles or directly to the crusher at the process plant, while the waste is hauled to waste rock dumps.

There has been no open pit mining at Agnew since 2012, but this will change in H2 2022 with Barren Lands Open pit planned to start.

Current pits included in the 31 December 2021 Mineral reserve are 450 South, Maria South, Barren Lands and Hidden Secrets. Detailed mining studies were completed on each of these pits to a pre-feasibility study level, including external assessment of costs and the mining schedule, geotechnical assessments, metallurgical testwork and hydrological assessments for creek diversions. A pre-feasibility study has an estimated operating and capital cost accuracy of ± 25 % with a contingency of no more than 15 %.

Open pit mining will be by conventional drill and blast, with truck and shovel operations. Overall, the pits represent 4 % of the total reserve ounces for Agnew.

The open pits are seen as a consolidated approximate 12-month duration opportunity to ensure critical mass in mobilizing a contractor to complete all the open pits then de-mobilize. The drill, blast, truck and shovel equipment supplied will be supportive of mining the narrow orebodies with minimum dilution.

The open pits will be sequenced together to optimize the waste strip and expedite the ore to the processing facility. Agnew is not expecting to build significant stockpiles for future processing.

The Qualified person considered the following factors when selecting the open pit mining method:

(a) The geotechnical and rock behaviour models, see Section 7.4 for detail

a) The hydrological surveys as described in Section 7.3

b) The open pits are supplementary to the underground and are completed within twelve months of commencing

c) The modifying factors including strip ratios as stated in Table 12.2.1 and the open pit cut-off grades as stated in Table 12.3.1

d) The mining fleet configuration and equipment specifications as stated in

e) Table 12.2.6

f) Practical mining rates, selective mining unit dimensions, mining dilution and mining recovery

13.2 Underground

For Agnew's underground mines, access is through single or multiple decline haulages extending from surface portals. Horizontal and decline development at various intervals from the main decline, known as levels, extend laterally and provide access to the ore horizons for mining.

Once an orebody is accessed for mining (or stoping), production activities consisting of drilling, blasting, cleaning, ground support and transporting rock, which are carried out on a daily basis.

Broken ore is loaded straight from the stope face into trucks, using mechanical loaders, and hauled to the surface by underground dump trucks via the declines. Application of backfill or paste fill to the mined-out areas to support the ground is based on local conditions and is not always required in shallow underground mining areas.

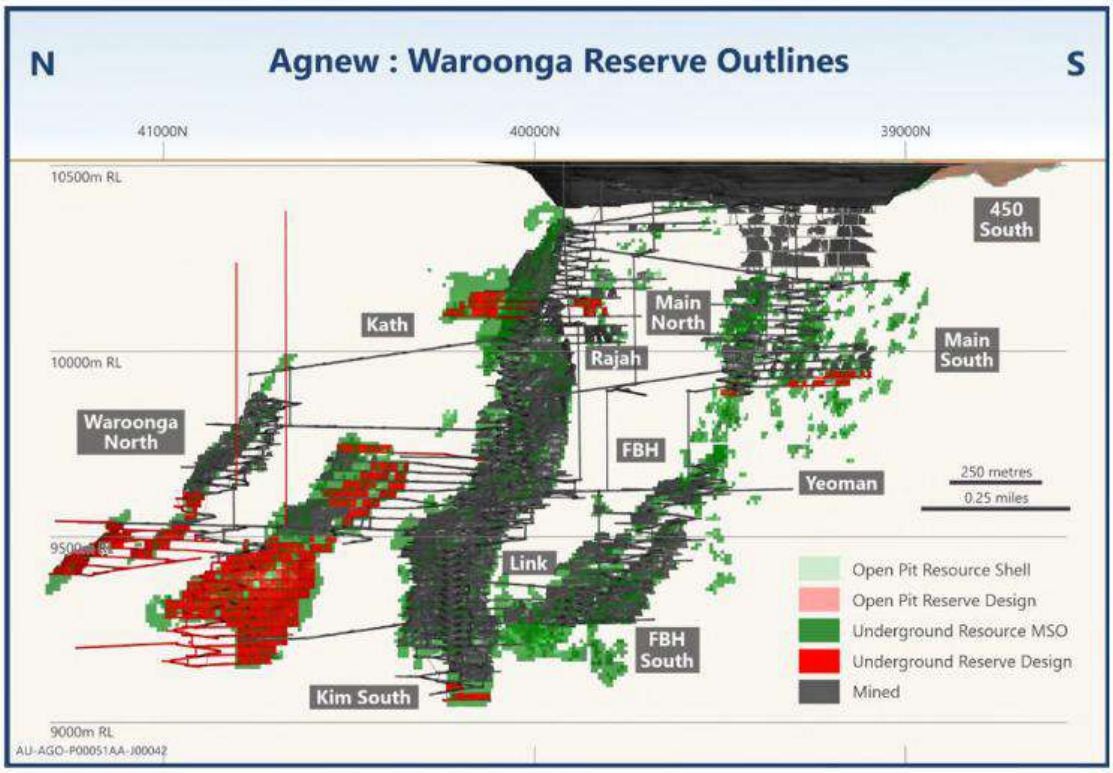
Both Waroonga and New Holland are established mines with existing infrastructure. The Redeemer Complex is proximal to the historic underground, and includes establishment of a new portal, surface infrastructure, declines, and underground infrastructure.

Mining operations at Agnew are carried out by a mixture of owner-operators and contractors, with equipment replacement schedules and leasing requirements considered in the mine plans. The reserves life of mine plan and associated financial models include sufficient infrastructure and sustaining capital investment for all mines to execute the life of mine plan.

13.2.1 Waroonga

Waroonga (Figure 13.2.1) is predominantly mined using open stoping with cemented paste fill where required. The underground mining is carried out under contract to Barminco including the supply of all equipment, refer to Table 12.2.6.

Figure 13.2.1: N-S Section of Agnew Mine's Waroonga complex



Notes: a) The final underground reserve

Source: Agnew CPR 2021

The mining method at Waroonga involves development of a hangingwall access drives parallel to the orebody, from which crosscuts are mined into the mineralized lode. Ore drives are mined north and south, with long-hole open stopes of 15 m to 25 m strike lengths. The level spacing is 20 m to 25 m floor to floor. Stopes, once complete, are backfilled with cemented paste fill where required, produced from screened dry tailings with the addition of sand and cement as a binder. Backfill is used for regional stability, minimize mining spans and to increase ore extraction ratios.

The general sequence for most of the mine is top-down, maintaining a 45º advancing front, retreat mining along strike under exposed paste fill from the mined-out levels. In some areas, including the upper parts of the FBH orebody and Waroonga North, a bottom-up mining sequence was introduced to provide additional mining areas.

Capital infrastructure including extension of the return air rise, secondary egress, paste fill pipes and dewatering system are incorporated into the Mineral reserve mine plan.

The Edmunds orebody sits in the footwall of the Kim South lode and is generally accessed from the Kim South crosscuts after paste filling on the level that has been completed. The Edmunds mining method is similar to the Kim South orebody, with a retreat stoping sequence. Edmunds strike lengths are between 15 m to 20 m, and all stopes are paste filled allowing improved extraction of the ore.

The mining method employed for the Main orebody evolved considerably over previous years. Modifications and redesigns to both on-level development and stoping extraction are made as the geological and geotechnical understanding improves.

The FBH mining area is located approximately 350 m along strike to the south of the Kim South orebody, and consists of multiple north-south narrow lodes dipping 65º to the west. The mining method for FBH is long-hole open stoping with paste fill. Stoping is top-down or bottom-up. FBH uses parallel developed tunnels with stoping retreating to the central accesses. Stope sizes are adjusted depending on competent or poor ground conditions.

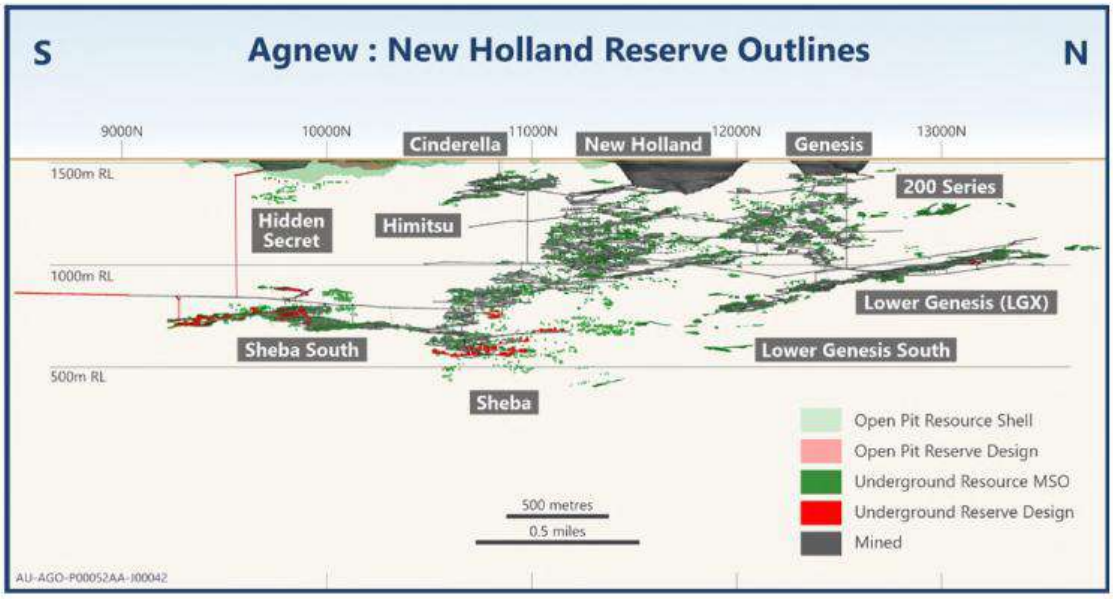
Most of the design assumptions used in FBH are consistent with those tested in Kim South. Hangingwall drives have increased ground support to reduce secondary ground support and maintain productivity. Ground conditions have been observed to worsen as mining extends at depth in FBH.

Overall, Waroonga is currently limited by geotechnical sequencing, ventilation and paste fill infrastructure constraints. The current Mineral reserve life of mine plan incorporates steady state development and production in line with these constraints.

13.2.2 New Holland

The mining methods used for the Mineral reserves at New Holland are inclined room and pillar and long-hole open stoping (Figure 13.2.2). All underground mining is completed by an owner-operator team (Table 12.2.6).

Figure 13.2.2: N-S section of Agnew Mine's New Holland complex



Notes: a) The final underground reserve

Source: Agnew CPR 2021

Long-hole open stoping is the principal ore extraction method, accounting for the majority of ore tonnes. Where necessary, rib and crown pillars are employed to maintain the stability of the stopes. Arch designed stope crowns assist stability.

Island pillars optimize extraction and are incorporated into the mine design when the dominant westerly-dipping structures are encountered. Pillar spans and spacing are based on the results of numerical stability modelling.

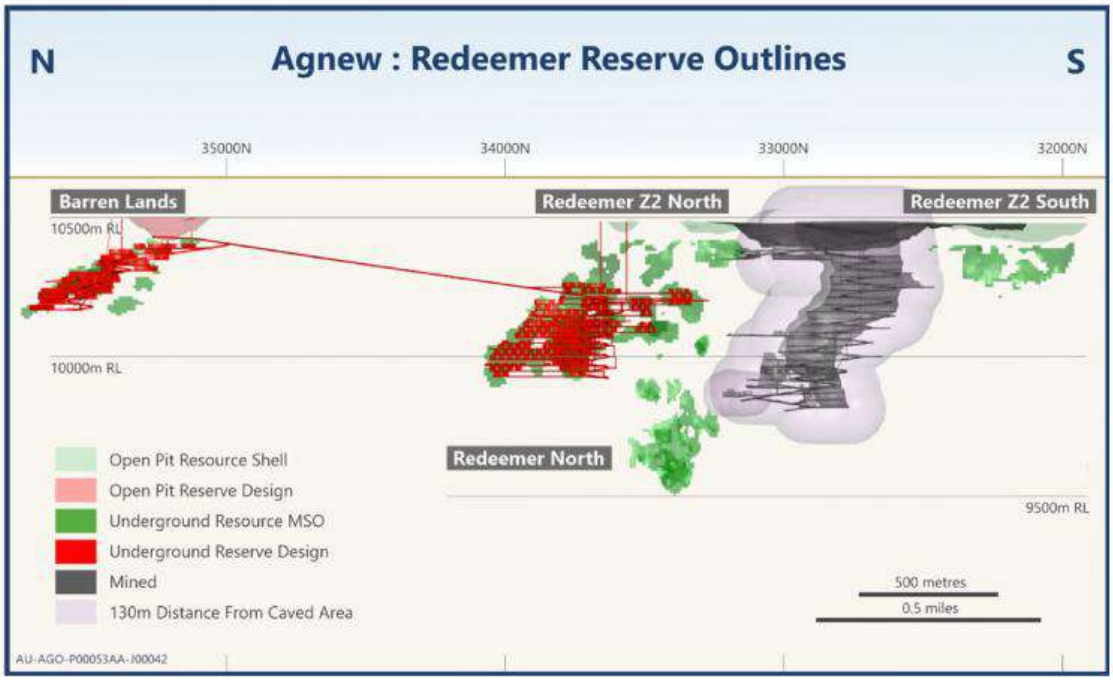
Recent mining knowledge has generally confirmed good to very good ground conditions at Cinderella, Himitsu, New Holland and Sheba. Sheba South ground conditions are expected to change at depth and increased ground support standards and reduced stope spans are planned.

Exploration drill drive development is underway to test the Sheba South lode at New Holland.

13.2.3 Redeemer

The undeveloped Redeemer Zone 2 and Barren Lands underground is offset to the north of the former Redeemer mine which is backfilled with tailings. Redeemer Zone 2 is 1 m to 10 m wide, with the majority of the targeted ore ranging from 1.5 m to 3.0 m wide at an inclination of 70 º to 90 º. The mine is 200 m to 500 m below surface with an orebody horizontal extent of circa 400 m.

Figure 13.2.3: N-S section of Agnew Mine's Redeemer complex



Notes: a) The final underground reserve

Source: Agnew CPR 2021

Redeemer Zone 2 and Barren Lands underground will be mined by long-hole open stoping with rib pillars and selective paste fill, top-down and a circa 45 º geotechnical production front. A central access design allows for northern and southern ore drives along the orebody. Stoping retreats to the central access.

The Redeemer portal is planned in the eastern wall of the Barren Lands open pit, approximately 60 m below surface, and 15 m above the pit floor. The Barren Lands Open Pit is planned to commence in Q3 and decline development planned to commence in H2 2023. Ground conditions are anticipated to be similar in nature to New Holland and as such production rates have been benchmarked against New Holland productivities.

- The redeemer complex will be accessed via: A single decline will drive approximately 1.6km south to access the Redeemer Zone 2 North orebody
- North to target the Barren Lands underground
- 1.8km to the vent and escapeway connections
- The decline is a figure-eight positioned centrally to the orebody, exclusively in the hangingwall rock units and at least 50 m off the orebody in the hangingwall.

The Qualified person considered the following factors when selecting the underground mining method for the Waroonga, New Holland and Redeemer areas:

(a) The geotechnical and rock behaviour models, see Section 7.4 for detail

a) The hydrological surveys as described in Section 7.3

b) The modifying factors including underground cut-off grades as stated in

c) Table 12.2.4Table 12.2.4

d) The mining fleet configuration and equipment specifications as stated in Table 12.2.6

e) Practical mining rates, stope size dimensions, mining dilution and mining recovery

f) Infrastructure and operating capacities and constraints

g) Capital and operating costs and economic viability

13.2.4 Geotechnical and hydrogeological parameters

Each mine at Agnew has a specific Ground Control Management Plan, which outlines the systems and processes used to address and manage the risks associated with ground control. The underground life of mine plans adapts to incorporate the evolving geoscientific information across a wide range of parameters including hydraulic radii, pillars, stope brows, abutments, sequencing, dilution, access development dimensions, mining induced stress and seismicity management. The open pits have been designed using the information in Table 7.4.1 and Section 12.2.4.

Regional Stability

The regional stability at Agnew is reviewed using numerical modelling software. This is undertaken when new mining areas are outlined. Extraction strategies, pillar sizes and abutment locations are evaluated during this modelling to ensure mine plans are geotechnically robust. Geotechnical analysis is undertaken at a pre-feasibility study level prior to the inclusion of new mining areas into reserves. Despite minor seismicity occurring, this is not considered a material risk.

Infrastructure

Long term infrastructure including declines, passes, ventilation shafts, raises and escapeways require individual geotechnical investigations early in the planning process. These types of infrastructure are critical long-term excavations and therefore are investigated by evaluating the effects of ground conditions and mining induced stresses on excavation performance throughout the required life of these excavations.

Early geotechnical evaluation allows the infrastructure to be relocated if adverse excavation performance is expected. The geotechnical analysis completed during the early design stage is generally refined based on any new information obtained during the final design stage.

Permanent infrastructure is designed to fall outside the zone of influence of stoping (i.e., located sufficiently far into the footwall and/or hangingwall to be unaffected by any regional collapses, relaxation or stress abutments).

A Ground Support Standard has been developed and each mining profile has specific requirements (e.g., bolting and meshing) that are calculated by development dimensions, the expected ground conditions, and the excavation life and serviceability. As mining has progressed deeper, stress effects are becoming more evident and therefore ground support requirements will be changed.

Stopes

Stope designs are a combined effort between the geology, production and geotechnical departments. The geotechnical input in early stage planning generally comprises the calculated stable stope dimensions, the minimum ground support required and other geotechnical considerations in relation to stoping.

The geotechnical input into the final stope design generally includes finalizing the stable stope dimensions and required ground support based on any new information.

Sequencing

The mining sequence can influence ore recovery, extraction ratios, ore dilution and level of rehabilitation required in the development excavations. To manage these effects, mining sequences are evaluated using geotechnical techniques to optimize ore extraction whilst minimizing dilution, without compromising safety. Numerical modelling is used to

provide an estimation of the influence of mining induced stresses on development excavations, stopes and geological structures. Numerical modelling results are used to optimize mining sequences.

Hydrogeology

Both the New Holland and Waroonga underground mines have experienced no significant issues with hydrogeology; however, Waroonga had issues with water ingress in 2017 through old workings and ungrouted surface drill holes following heavy rains. New Holland also experienced production delays in 2017 following intense localised rain events damaging roadways and filling the pit sump.

Flood management trigger-action-response plans are in place for both operations.

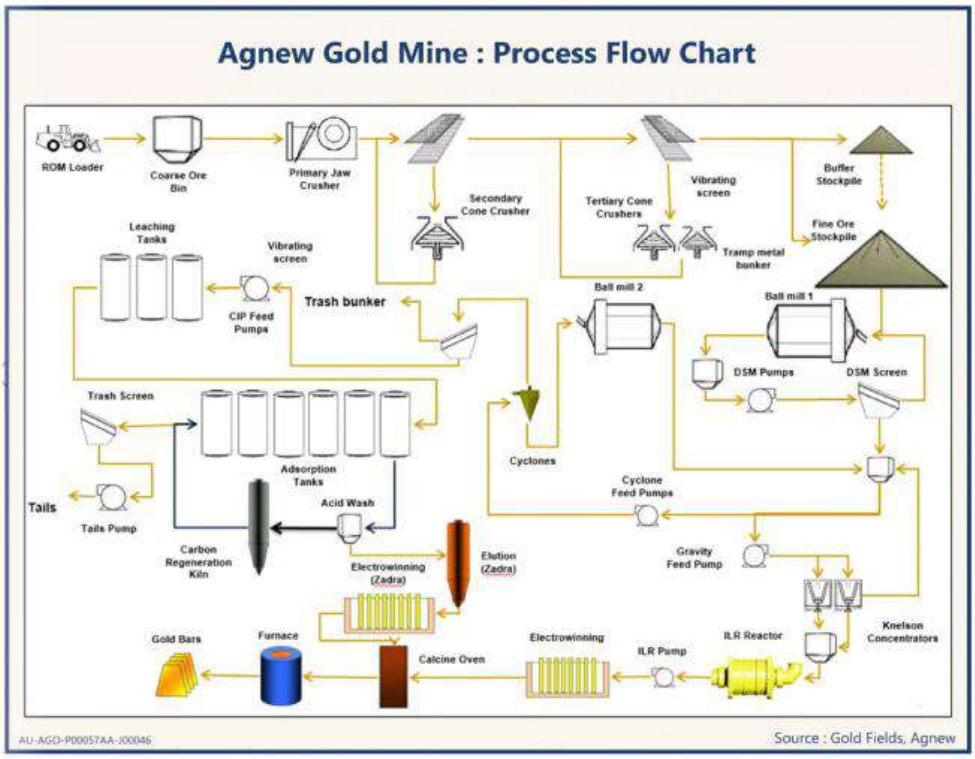
The Qualified person's opinion is that all appropriate geotechnical and hydrogeological parameters have been suitably considered and risk assessed to support the mining method selection and extraction sequencing and this information is embedded in Agnew's Ground Control Management Plan which is routinely updated as new empirical information becomes available. The mine plan is geotechnically robust from a local and regional stability perspective.

14 Processing and recovery methods

14.1 Flow sheet and design

The 1.3 Mt per annum (approximate) Agnew CIP process plant is a conventional crush-grind-leach-CIP circuit as all ore sources are reasonably amenable to gold extraction using cyanide. A schematic process flow sheet for the process plant is shown Figure 14.1.1.

Figure 14.1.1: Schematic flow diagram of Agnew process plant



Source: Agnew CPR, 2021

The crushing circuit comprises of a primary jaw crusher followed by a secondary and two tertiary crushers in closed circuit with double deck screens. Crushed product is fed from the fine ore stockpile and ground to 80 % passing 125 µm using a two-stage closed circuit primary and secondary ball milling circuit with two overflow type ball mills and 1,200 kW motors.

The gravity circuit comprises two 40" QS40 Knelson concentrators with dedicated InLine Leach Reactor for intensive cyanidation of the gravity concentrate.

The leach circuit is comprised of three air agitated Pachuca leach tanks each providing an effective volume of 4,100 m^3. The adsorption circuit consists of six air agitated Pachuca adsorption tanks with an effective volume of 3,000 m^3. Each adsorption tank is fitted with "V" style inter-stage screens and an airlift carbon advance system. Loaded carbon is recovered from the first adsorption tank via a vibrating loaded carbon screen. Loaded carbon from the adsorption circuit reports to the acid wash hopper where it undergoes a hot hydrochloric acid wash.

Acid washed carbon is loaded into a pressure Zadra elution column followed by electrowinning at approximately 130°C and 350 kPa. The elution column has a 3.0 t capacity and one elution is conducted each day. Barren carbon from the elution circuit is regenerated in a carbon regeneration kiln.

Gold sludge from both the gravity and electrowinning circuits is washed and filtered. The sludge is further refined through smelting and crude doré is poured. Gravity doré bars are approximately 90 % to 95 % gold whereas doré bars from the CIP circuit are dependent on ore feed characteristics and can vary between 65 % and 80 % gold. Doré is dispatched to the Perth Mint refinery for further processing into gold bullion.

14.2 Recent process plant performance

The recent performance of the Agnew process plant is provided in Table 12.2.1.

14.3 Process plant requirements

Due to age, operability and reliability issues, the circa 1990 ex-contract tertiary crushing plant is being replaced with a new tertiary crushing plant. The construction of this new plant, and associated fine ore storage bin, commenced in 2021 and is scheduled to be commissioned during 2022.

The process control systems of the remaining plant sections have been progressively upgraded over recent years to modernise the plant, and to improve its operability and performance.

Other minor sustaining capital work planned in 2022 includes:

- Tailings delivery pipeline upgrade
- Leach tank repairs
- Infrastructure remediation

The key process plant requirements estimated for the end-2021 Reserve LoM plan are summarised in Table 14.3.1. These consumables quantities have been estimated using guidance from the 2022 Budget LoM, prorated based on plant feed mass. The number of plant employees required is in the range of 50 to 60.

Table 14.3.1: Agnew process plant – key requirements summary

	Unit	Year					
		2022	2023	2024	2025	2026	2027
Ore Processed	kt	1,267	1,123	1,173	829	491	256
Plant Power draw	GWhr	34	32	33	28	22	19
Grinding Media	t	827	733	766	541	321	167
Lime	t	44	57	59	42	26	59
Sodium Cyanide	t	34	30	31	22	13	7
Caustic	t	12	10	11	8	4	2
Activated Carbon	t	6	5	5	4	2	1
Hydrochloric Acid	t	4	4	4	3	2	1
Peroxide	kL	68	60	63	44	26	14

Source: Agnew CPR 2021

Gold Fields is currently considering various plant throughput upgrade options associated with optimizing potential future increases in the mine life at Agnew. However, the end-2021 reserve life of mine, as shown in Table 14.3.1 does not incorporate such potential future plant upgrades.

14.4 Processing Risks

14.4.1 Major Equipment Failure

Industrial mineral processing plants consist of a series of dedicated unit processes, e.g., crushing, grinding, leaching, carbon-in-pulp (CIP), and carbon elution. There is inherent risk associated with catastrophic failure of one (or more) of the key equipment items associated with these unit processes, whereby such failure could lead to a significant period

of plant downtime until repairs are completed, resulting in the inability of the processing plan or forecast to be achieved and/or higher operational costs incurred than anticipated.

Catastrophic failures could be associated with the structural, mechanical, or electrical components of the key processing equipment items. Key equipment items could include the crushers, grinding mills, or leach/CIP tanks.

Risk minimisation activities to reduce the likelihood of such occurrences adopted by Agnew includes:

- Dedicated on-site maintenance department which undertakes condition monitoring activities, preventative maintenance, and repairs
- Critical spares (e.g., spare mill motors and gearboxes)
- Contingency operational plans (e.g., contract/mobile crushing plant, leach/CIP tank by-passing)
- Fire suppression systems
- Insurances

Decisions associated with asset management, critical spares, insurances, etc. are outside the responsibility and accountability of the Qualified person, and that some inherent risk and uncertainty associated with catastrophic failure of processing equipment remains.

14.4.2 Plant Operational Management

The processing facilities are managed and operated by dedicated teams of personnel, who are required to make many operational and maintenance decisions every day. These decisions can directly impact the performance of the plant while processing the future ore reserves.

For example, a decision to process ores at a higher throughput could result in a coarser grind size from the grinding circuit, resulting in a lowering of the plant recoveries. Similarly, the choice to operate the leaching circuit at lower free cyanide concentrations to reduce cyanide usage rates, could result in lower plant recoveries being achieved than anticipated.

It needs to be recognised that plant management and the associated decisions made by plant operating personnel, are outside the responsibility and accountability of the Qualified person, and that such decisions and actions taken by plant management can influence the achieved performance of the plant (e.g., throughput, costs, availability and recoveries).

14.4.3 Operating Costs, Plant Consumables and Reagents

The operating cost of the processing plant represents a significant cost element to the overall financial evaluation of the reserve life of mine plan. The processing facilities use relatively large quantities of power, reagents and consumables, including fuels, cyanide, grinding steel media, lime, caustic, etc.

The estimation of future processing costs is required as input into the cut-off-grade calculations and economic assessments of the Mineral reserves and Mineral resources. Processing cost estimates require assumptions to be made concerning consumables consumption rates, unit prices and inflation rates.

Metallurgical testing undertaken on the future reserves provides reasonable guidance of potential reagent consumption rates and mill throughput expectations, and this information is considered and reviewed by the plant metallurgist and the Qualified person.

Agnew, like many other operating gold processing plants that have a reasonable operating history, do not allow for a discreet operating cost contingency in their future operating cost forecast. The absence of contingency is considered by the Qualified person as being a common and reasonable approach to operational process plant cost forecasting.

Consumables, commodity pricing and inflation are subject to external influences that are outside the control or predictive capability of the Qualified person.

Further to this, operational decisions made by plant management, or unexpected variances in the nature of the ores being processed could unexpectedly impact reagent and consumables usage rates. Such variances are outside the control or predictive expectations of the Qualified person.

The Qualified person's opinion is that all key processing parameters have been suitably reviewed to support the processing and recovery methods incorporated in the Agnew life of mine plan. The processing flow sheet, plant design, equipment and specifications are all within demonstrated operating ranges experienced at the mine over an extended operating history.

15 Infrastructure

Agnew is serviced by sealed road infrastructure to the mine gate. Supplies are generally trucked in from Perth or Kalgoorlie. Agnew is a fly-in fly-out operation with local services and external accommodation including air transport with a sealed runway. A new mine owned camp was completed in 2019, which accommodates the mine employees and contractors. The bulk of the water is supplied from the mining operations and recovered from the in-pit tailings facility and previously mined pits.

Details on each major item of non-process infrastructure is discussed in this section. The site infrastructure layout is shown in Figure 3.1.1.

15.1 Tailings storage facilities (TSF)

Process plant tailings do not undergo any thickening before discharge and are pumped directly to the active tailings storage facility 4 (TSF 4) at the former Songvang open pit approximately 15km south of the Agnew process plant. Hydrogen peroxide is injected into the tailings slurry at the tailings pump box to maintain weak acid dissociable (WAD) cyanide concentrations below 50 ppm when required. This is the maximum concentration deemed acceptable for compliance to the International Cyanide Management Code (ICMC), which Agnew is a signatory to.

No design or construction drawings have been located for tailings storage facility 1, located within 100 m south-east of the Processing Plant. Tailings storage facility 1 occupies approximately 9.4 Ha with a maximum embankment height of approximately 10 m at the southern end. As can be ascertained, tailings storage facility 1 was initially constructed in 1985 using mine waste and was raised by downstream construction using mine waste. Tailings deposition to tailings storage facility 1 ceased in 1988, although the facility was designated for emergency use between 1988 and 1992. Approximately 0.77 Mt of tailings were deposited into tailings storage facilities 1.

Tailings storage facility 3 is an in-pit facility using the former Redeemer open pit approximately 6km south of the Agnew plant. Tailings storage facility 3 is nearing the end of its life and is currently used on an intermittent basis following the commissioning of tailings storage facility 4. Tailings storage facility 2 is an above ground paddock storage facility approximately 1km to the west of the process plant. Tailings storage facility 2 has not been used as an active tailings storage facility since the commissioning of tailings storage facility 3 in 2004 and is now used as a source of backfill for the paste plant operations at Waroonga.

Tailings storage facility 4 was commissioned in 2017 with a design capacity of 9.1 Mt of tailings. Based on the evidence provided by the EoR, there are no material deficiencies with the existing facilities.

The existing operational tailings storage facility, the Songvang pit (tailings storage facility 4), has an available capacity of ~4.2 Mt up to elevation 404 m AHD. This is insufficient to contain the current Mineral reserve LoM plan requirement of ~5.1 Mt of tailings. Therefore, the EoR has been engaged to commission tailings storage studies in Q1 2022 to increase the available storage capacity by increasing the maximum fill level to ~ 420 m AHD.

The tailings delivery pipeline from the plant to tailings storage facility 4 is due for replacement in 2022.

The Engineer of Record (EoR) for the Agnew tailings storage facilities is CMW Geosciences based in Perth. All tailings storage facilities need to conform with the Global Industry Standard on Tailings Management (GISTM) by August 2025. A gap analysis has been completed, and the GISTM compliance programme is underway in collaboration with the EoR.

Figure 15.1.1: tailings storage facilities locations

Source: Agnew CPR 2021

15.2 Waste rock dumps

In open pit mining, access to the orebody is achieved by stripping the overburden in benches of fixed height to expose the ore below. This is most typically achieved by drilling and blasting an area, loading the broken rock with excavators into dump trucks and hauling the rock and/or soil to dumps. The overburden material is placed on designated waste rock dumps.

Process plant tailings waste and waste rock are two of the most significant by-products produced by mines. By responsibly managing these waste streams, we can minimize their impact on the environment and our host communities.

15.3 Water

All water used at Agnew is sourced from groundwater. The primary and largest use of groundwater is for ore processing, followed by dust suppression, paste plant operations and potable water.

Mine dewatering is reused within the underground mine for dust suppression, the paste plant and to supplement process water. Return water return from the tailings storage facilities is the largest source of water for the process plant. A water supply of up to 4,900 kl/day is required for processing.

Additional water is supplied from the Fairyland borefield (located approximately 22km from the process plant) and the Daisy Queen borefield (located approximately 12km from the process plant), EMU borefield (approximately 2km from process plant) and the former Hidden Secret open pit at New Holland.

The current operation is utilizing 50 percent of the licenced allocation (3,377,980 kl/annum of 6,810,000 kl/annum) across three GWLs. 2 Gl/annum is required for mine make-up water requirements.

15.4 Power

The hybrid power station on the Agnew mine site commissioned in 2020 comprises 18 MW of gas generators, 3 MW of backup diesel generators, 4 MW of solar, 18 MW of wind generation and a 13 MW/4 MWh battery. More than 54 % of Agnew's power is generated from renewable sources. Currently, expansion studies are underway to accommodate growth at New Holland, the Redeemer complex and the Greater Agnew Project with solar as the primary source of energy.

15.5 Accommodation

Site accommodation is provided by an 815-person mining camp built in 2019 located directly south of the former Agnew townsite. The accommodation village is managed by Civeo.

15.6 Site access

Mine site access is dual lane elevated truck compacted roadways constructed from mining waste material connect the surface infrastructure. These roads connect the existing operating mines, infrastructure and old workings (Figure 3.1.1). There is minimal access requirement to service the satellite pits.

15.7 Other infrastructure

Agnew has one paste plant located to the north of the Waroonga pit. The paste is distributed through three paste fill reticulation bore holes. These holes are sufficient for the underground life of mine reserve. The Redeemer and Barren Lands underground life of mine reserve does not require paste fill.

Agnew has ancillary infrastructure to support mining. These include an airfield, workshops, mine offices, training centres, communications, medical and emergency response, maintenance, laboratory, core yard/sample storage, contractors' yard, explosives compound, fuel and reagent storage, and sewage and renewable hybrid energy generation facilities.

The Qualified person believes that the infrastructure for the Agnew mining operation is fit for the life of mine reserve estimation and that the Mineral reserve quantities are tested against dump and disposal capacities. The Engineer of Record has been engaged to commission tailings storage studies in Q1 2022 to increase the available storage capacity of the Songvang pit by increasing the maximum fill level.

16 Market studies

16.1 Preliminary market study

A review of metal prices for planning purposes is undertaken annually to monitor any significant changes in price trends or exchange rates that would warrant re-calibrating the price deck before the Strategic Planning process transitions into the Business Planning cycle.

This review of the metal price deck has taken account of the prevailing economic, commodity price and exchange rate (Fx) trends, together with market consensus forecasts, in addition to consideration of the Gold Fields' strategy and expectations for the operations.

Our strategy is to (1) mitigate annual volatility by holding planning metal prices as long as warranted to support stability in mine planning, notably regarding the underground MSO and open pit shell selections; (2) maintain appropriate margins on spot and long-term price forecasts to support the Group's BSC metrics; (3) protect against accelerating mining sector inflation and, (4) to confirm a separate gold price to be used specifically for the Operational Pan (budget) revenue streams and cash flows in Q3 each year.

The outcome of the pricing analysis was to use a gold price of $1,300/oz for Mineral reserves and $1,500/oz for gold Mineral resources for the December 2021 disclosure of estimates. The relevant copper and silver prices in US Dollars are shown in the summary table below. Note the A$/oz and ZAR/kg gold prices applied to the estimates in Australia and South Africa are included for transparency.

Table 16.1.1: Reserve and Resource metal prices

Units		December 2021 Metal price Deck	
Metal	Unit	Mineral reserve 31 Dec 2021	Mineral resource 31 Dec 2021
Gold	US$/oz	1,300	1,500
	A$/oz	1,750	2,000
	ZAR/kg	650,000	750,000
Copper	US$/lb.	2.8	3.2
Silver	US$/oz	17.5	20.0

Source: Agnew CPR 2021

The above price deck comparison to market long-term forecasts assessed at the time of analysis is consistent with the Registrants approach to retaining good discipline in support of the Company strategy; this approach ensures Gold Fields' Mineral resources and reserves are not too volatile year-on-year and that the company is protected against possible downside scenarios if the gold price falls up to ~25 % in any specific year. Ensuring sufficient flying height to maintain our margins at prices that could be incrementally lower than the spot price ranges seen in 2021 is also important. Equally, with annual mining sector inflation estimated at $30-40/oz, we need to ensure we mitigate this escalation risk in the life of mine plans and Mineral reserve estimates.

Sensitivity analysis on gold price for project financial evaluation is done to provide flexibility/range analysis for all regional studies and site growth opportunities and investment purposes.

The Mineral resource gold price premium to the Mineral reserve price is circa 15 % and the differential is in general alignment to our peer group and industry standard practice. The Mineral resource price premium is to provide information on each operation's potential at higher gold prices and to indicate possible future site infrastructure and mining footprint requirements.

All gold produced at Agnew is refined by the Perth Mint in Western Australia. The Perth Mint applies competitive charges for the collection, transport and refining services. The Perth Mint takes responsibility for the unrefined gold at collection from the operation where it engages a sub-contractor, Brinks Australia. Brinks delivers the unrefined gold to the Perth Mint where it is refined, and the refined ounces of gold and silver are credited to the relevant metal accounts

held by the operating company with the Perth Mint. The contractual arrangement with the Perth Mint continues until terminated by either party upon 90 days' written notice.

Gold Fields' treasury department in the corporate office in Johannesburg, South Africa sells all the refined gold produced by the operating company. On collection of the unrefined gold from a mine site, the relevant operating company will notify Gold Fields' treasury department of the estimated refined gold content, expressed in troy ounces, available for sale. After such confirmation, the treasury department sells the refined gold to authorised counterparties at a price benchmarked against the London Bullion Market Association PM gold auction price. All silver is sold to the Perth Mint at the London Bullion Market Association silver price on the last business day of each month.

Gold Fields may periodically use commodity or derivative instruments to protect against low gold prices with respect to its production. Variations in gold price, currency fluctuations and world economics can potentially impact on the revenue received. No gold derivative instruments are in place at the date of this report.

The majority of gold production is used for jewellery and for investment purposes, in the latter case because the market views it as a store of value against inflation. In addition, certain physical properties of gold, including its malleability, ductility, electric conductivity, resistance to corrosion and reflectivity, make it the metal of choice in a number of industrial and electronic applications.

Supply of gold consists of new production from mining, the recycling of gold scrap and releases from existing stocks of bullion. Mine production represents the most important source of supply, typically comprising 75 per cent. each year. Annual demand requires more gold than is newly mined and the shortfall is made up from recycling. Management believes that long-term gold supply dynamics and global economy trends will support the gold price at levels above or aligned to $1,300 per ounce in the long-term.

The market for gold is relatively liquid compared to other commodity markets, with London being the world's largest gold trading market. Gold is also actively traded via futures and forward contracts. The price of gold has historically been significantly affected by macroeconomic factors, such as inflation, exchange rates, reserves policy and by global political and economic events, rather than simple supply/demand dynamics. Gold is often purchased as a store of value in periods of price inflation and weakening currency. The price of gold has historically been less volatile than that of most other commodities.

Significant service contracts and/or leases that are in place to enable execution of the life of mine plan include:

- Perth Mint - Refining
- Barminco – Mining & Drilling
- MLG – Ore Haulage
- Coastal Midwest Transport - Freight haulage
- RUC Cementation – Raise boring
- APA Operations – Gas Transportation
- EDL – Power supply
- Alliance Airlines – Flights
- Action Industrial Catering – Camp Services
- ALS Global – Assay Services

The Qualified person has relied on information provided by the Company in preparing its findings and conclusions regarding market studies related to gold sales from Agnew. Refining services are based on well-established long-term agreements and expediting gold sales over the life of the asset does not represent any significant uncertainty. Service contracts, lease agreements and goods contracts e.g., diesel, cyanide and cement, necessary to develop the property as planned, are in place and have the capability to support the full projected cash flow period.

16.2 Metal Price history

Gold prices London Metals Exchange afternoon close

- Gold spot 30 December 2021 - $1,805.85/oz - A$2,484.32/oz
- Fx 30 December 2021 A$1:$0727c
- Gold spot 24 month average - $1,784.5/oz
- Gold spot 36 month average - $1,653.71/oz
- Gold spot 60 month average - $1,497.48/oz

17 Environmental studies, permitting, and plans, negotiations, or agreements with local individuals or groups

Climate change is an integral part of the Mineral reserve generation process and incorporating relevant costs associated with climate change, primarily decarbonisation, mitigation and adaptation to the changing climate, is a key theme for the Company. Integration of these key elements into the Mineral reserve process is being carried out progressively and simultaneously across all of Gold Fields' sites.

17.1 Permitting

The key operating environmental permits for the operation are issued by DMIRS and DWER and relate to:

- Mining proposal which includes land clearing, disturbance and infrastructure
- Environmental licence
- Native vegetation clearing
- Mine dewatering (category 06)
- Water abstraction and groundwater operating strategies
- Sewerage facility (category 54)
- Putrescible landfill site; and
- Mine Closure Plan

The operation has these permits in place and manage the obligations through the legal register.

No penalties, sanctions or directives that are currently in place (2021 to current) related to the permitting framework at Agnew.

A Mining Proposal has been approved by the Western Australian Department of Mines, Industry Regulation and Safety (DMIRS) for the most recent Barren Lands Open Pit Project. Amendments to the site Environmental Licence which is governed by the Western Australian Department of Water and Environmental Regulation (DWER) may be required for dewatering of the open pit during operations or dewatering of the planned Redeemer underground operations.

Heritage surveys are conducted to support both mine development and exploration targets. At this stage no Section 18 approvals are required under the Aboriginal Heritage Act to support future operations and drilling.

A Project Management Plan is currently being developed for submission to the Department of Mines, Industry Regulation and Safety for the Barren Lands Open Pit Project, which is a requirement before mining can commence.

The Agnew Department of Water and Environmental Regulation DWER Environmental Licence is pending amendments for the new crushing facility, water discharge into the Cox pit and dewatering of the Barren Lands open pit.

A summary of all current Agnew Gold Mining permits is provided in Table 17.1.1.

Table 17.1.1: Select list of Agnew permits

Number	Purpose	Registered holder	Status	Grant date	Expiry date	Fines
L4611/1987/11	Operating Licence - Agnew	AGMC	Granted	18/10/2013	23/10/2022	Nil
GWL63840(7)	Fairyland pit dewatering	AGMC	Granted	26/05/2015	04/12/2023	Nil
GWL151398(5)	Fairyland borefield	AGMC	Granted	05/12/2013	04/12/2023	Nil
GWL64335(10)	Agnew mining areas	AGMC	Granted	04/01/2016	28/12/2025	Nil
GWL55840(9)	Lawlers and Daisy Queen	AGMC	Granted	20/05/2014	04/12/2023	Nil

134.09	Approval to install sewage treatment apparatus	AGMC	Granted	N/A	N/A	Nil
CAW201054(1)	Construct or alter well	AGMC	Granted	19/03/2018	19/03/2020	Nil
CAW183582(1)	Construct or alter well	AGMC	Expired	13/12/2016	13/12/2022	Nil
5110/1988/10	Operating Licence - Lawlers	AGMC	Granted	16/10/2013	19/10/2031 12:00:00 AM	Nil
8248/1	Clearing Permit	AGMC	Granted	01/03/2019	01/03/2024	Nil

Notes:
a) The Qualified person has selected a few permits to demonstrate permitting
b) The Qualified person is of the opinion that the licences are in good standing and that any current or future licencing can and will be obtained for the Mineral reserve or the Mineral resource.
c) The Qualified person is of the opinion that Agnew has a good standing with licencing authorities, community groups and that licencing is not expected to be material to reserves or resources
d) Agnew is conducting continues rehabilitation and has a large closure liability. The Qualified person is of the opinion that the closure estimates and duration are reasonable and practical

Source: Agnew CPR 2021

There is no legal obligation in Western Australia to have unconditional performance bonds in place for mine closure liabilities. Such liabilities for continuing operations are now self-funding. In addition, companies are required to pay a levy to the state based on the total mine closure liability. This levy is 1 % of the total liability per mine, paid annually. This levy goes into a state administered fund known as the Mine Rehabilitation Fund. Capital and interest from the fund will be used to rehabilitate legacy sites or sites that have prematurely closed or been abandoned.

17.2 Environmental studies

The regulatory framework and context for the operation ensure that relevant specialist studies are undertaken as part of the permitting requirements and processes. Agnew is entitled to mine all declared material falling within its respective Mining Leases with all necessary statutory mining authorisations and permits in place. The current Environmental Impact Assessments (EIA) and Environmental Management Programme Reports (EMPR) include:

- Fauna and flora surveys and reports.
- Heritage surveys and reports.
- Closure planning review and updates.
- Contamination/ecotox/hazard investigations.
- Hydrogeological/groundwater modelling.
- Landform design and engineering for waste landforms.
- Waste characterisation reports.
- Development of landform decommissioning plans.
- Annual dam safety inspections of active tailings storage facilities.
- Surface water hydrology and drainage assessment studies.
- Maintenance of material inventory balance studies.
- Contaminated sites management and development of Preliminary Site Investigations.

There is no Annual EIA for Agnew Gold Mine, there are however a series of annual reports which are submitted each year to various Government Departments which cover monitoring and measurement against potential environmental impacts. These are shown in Table 17.2.1.

Table 17.2.1: Government Departments which cover monitoring and measurement against potential environmental impacts

Report Name	Type	Frequency
DWER L4611/1987 Operating Licence – Agnew – Annual Environmental Report & Annual Audit Compliance Report	Regulatory	Annual
DWER L5110 Operating Licence – Lawlers – Annual Environmental Report & Annual Audit Compliance Report	Regulatory	Annual
DMIRS Agnew Annual Environmental Report	Regulatory	Annual
DMIRS Lawlers Annual Environmental Report	Regulatory	Annual
DMIRS Cams Annual Environmental Report	Regulatory	Annual
Agnew Tailings Dam Audit – DMIRS	Regulatory	Annual
Agnew Mine Closure Plan	Regulatory	Annual
Clearing Permit Report – DMIRS	Regulatory	Annual
Groundwater Monitoring Summary/Review – Fairyland Pit, Fairyland Borefield, Lawlers & Daisy Queen, Agnew Mining Areas	Regulatory	Annual
Mining Rehabilitation Fund	Regulatory	Annual
National Pollutant Inventory	Regulatory	Annual
National Greenhouse Emissions Reporting Scheme	Regulatory	Annual
Tjiwarl Native Title Agreement Report	Regulatory	Annual
SPR/GRI reporting	Internal	Monthly

Source: Agnew CPR 2021

Key outcomes of the environmental studies include:

17.3 Waste disposal, monitoring and water management

17.3.1 Tailings storage facilities (TSF)

The operation of the Agnew tailings storage facilities is audited quarterly by a third-party consultant, CMW GeoSciences, who is also the appointed Engineer of Record (EoR). The independent technical reviewer is Coffey (Tetra Tech). Based on observations made by the EoR, the facilities are deemed to be in good order.

Tailings storage facilities 1 to 3 have been assigned an ANCOLD consequence classification of Very Low, while tailings storage facility 4 has been assigned a consequence classification of Low.

The total freeboard on in-pit tailings storage facility 3 was between 1 m and 2 m at the last EoR site visit and was assessed as adequate. Tailings storage facility 4 has adequate freeboard estimated at ~70.5 m. Tailings storage facility 2 is currently being reclaimed for use as underground paste backfill. In addition, the Redeemer in-pit tailings storage facility (tailings storage facility 3) is used occasionally for tailings deposition to optimize the final rehabilitation landform.

Bathymetry surveys are carried out quarterly. These surveys are used to estimate the tailings insitu density, water volume and evaluate the tailings profile underwater.

Embankment movement monitoring is not carried out on tailings storage facility 3 or tailings storage facilities 4 at Agnew, as both are in-pit facilities. Phreatic surface levels at Agnew tailings storage facility 2 have not been measured since 2018 as tailings storage facility 2 is being reclaimed using an excavator and trucks. tailings storage facility 3 and tailings storage facility 4 are both in-pit facilities.

The Agnew tailings storage facilities were surveyed during Q3 2021. tailings storage facility 2 and tailings storage facility 3 had no water present, and tailings storage facility 4 had ~17.0 % pit perimeter area coverage with water and a water volume of ~20,104 m^3.

The pH, TDS, and WAD CN observations at tailings storage facility 2, tailings storage facility 3 and tailings storage facility 4 complied with the DWER licence requirements.

The water levels are monitored in 6 bores around Songvang (tailings storage facility 4), 9 bores around the Redeemer Pit (tailings storage facility 3), and 8 bores around tailings storage facility 2 every quarter in accordance with the DWER licence. The standing water levels in all Songvang tailings storage facility 4 groundwater bores have been consistent throughout Q3 2020 – Q3 2021, with no significant variations observed. Groundwater monitoring results did not highlight any concerns with any of the active tailings storage facilities at Agnew.

The tailings storage facilities at Agnew are being well managed from a dam safety and governance perspective.

(a) The Qualified person believes that the procedures and monitoring, water management practices are adequate for the life of mine reserve estimate. A PFS study is ongoing to support the current reserve TSF capacity shortfall of ~1 Mt and will be completed towards the end of Q1 2022.

17.3.2 Waste rock dumps

Design and construction parameters for waste rock landforms are determined through "best practice" materials characterisation and erosion testing and modelling. For new landforms, this process is undertaken as part of the Mining Proposal preparation process and for the existing and "legacy" landforms, these are undertaken as required, for remedial and closure planning. Unless indicated otherwise, each landform/project area has a specific set of design and construction parameters developed, representing a closure concept. The closure plan is updated with these details as required.

(a) The Qualified person is of the opinion that the waste rock dumps at Agnew are adequate for this life of mine reserve plan. Regular waste rock inspections are performed to assess safety.

17.3.3 Water management

Agnew holds four groundwater abstraction (water drawn from bores) licence (GWL64335, GWL63840, GWL151398 and GWL55840) administered by the Department of Water and Environmental Regulation (Table 17.1.1). This allocation allows annual combined abstraction of 7,175 ML and adequately covers Agnew's maximum possible water abstraction requirements.

Groundwater monitoring is managed by the site environmental department and is conducted regularly as part of the Department of Water and Environmental Regulation licence and Mining Lease conditions, and Mining Proposal commitments. These monitoring programmes include groundwater levels and water quality at the borefields, dewatering pits and surrounding the tailings storage facilities.

Water management is not considered to present a major risk to Agnew. The acquisition of the Lawlers tenements from Barrick Gold in 2013 has greatly increased Agnew's water options and regular reviews are carried out to ensure the current resources are sustainably utilised.

Most of the water at Agnew is reused within the mining areas and processing circuits. Storage is largely in settling and storage ponds as well as disused open pits. The key operational areas are also supported with tanks that contain enough surge volume to ensure minimal interruption to business in the event of a pump failure at one of the ponds.

(a) The Qualified person is of the opinion that the water balance and procedures are adequate and support the life of mine reserve estimate

The current operation is utilising approximately 50 percent of the licenced allocation (3,377,980 kL/annum of 6,810,000 kL/annum) across three GWLs. About 2 GL/annum is required for mine make-up water requirements.

Water for processing primarily comes from tailings storage facility return water (recycled water) and borefield extraction water (groundwater). Water for mining comes predominantly from recycled U/G dewatering (recycled mine water) and the water for Camp and consumption only comes from borefields (groundwater).

Discharge to the environment is licenced under Department of Water and Environmental Regulation licences L4611/1987/11 and L5110/1988/10 (Table 17.1.1). These licences cover the following regulated processes: Processing or beneficiation of metallic or non-metallic ore:

- Mine dewatering.
- Putrescible landfill sites.

Dewatering of the Waroonga underground operations is directed to the Waroonga settling ponds. The settled water is either returned underground and used for dust suppression or directed to the paste plant or process plant via the tailings storage facility 2 return water ponds. Surplus water is discharged to the Hidden Secret open pit.

Dewatering of the New Holland underground operations is directed to the New Holland settling ponds. The settled water is either returned underground or is discharged to the Hidden Secret open pit.

Water is also drawn from the former Daisy Queen pit at Lawlers and directed to Redeemer for use at the process plant. Apart from tailings being discharged into tailings storage facility 4, tailings from the process plant is pumped to tailings storage facility 3 (Redeemer in-pit) intermittently to achieve and develop the closure landform. Return water is directed to the process plant via the tailings storage facility 3 and tailings storage facility 2 return water ponds.

Water is also abstracted from the New Woman, EMU and Fairyland borefields for use in the process plant, underground cooling system and general amenities.

Agnew borefield refers to a combination of the New Woman and EMU borefield with New Woman used as a standby field.

The water management strategy is being continually improved to better utilise and conserve the groundwater resources at Agnew. The principal water conservation strategy is to maximise water recovery from the tailings storage facilities back to the process plant. The Fairyland borefield has potential for increased abstraction and provides the operation with flexibility if greater amounts of groundwater are required in the future.

17.4 Social and community

Agnew's tenements cover an area over which one Native Title rights exist. The Tjiwarl and Tjiwarl#2 claims (WAD228 of 2011 and WAD 302 of 2015), which cover part of the area comprising the Agnew operations, were determined in 2017 by the Federal Court under the Native Title Act 1993 (Cth). In 2018, the Darlot People registered a claim under the Native Title Act over an area including a small part of Agnew. This claim is still proceedings through the Federal Court process. In 2019, the Federal Court dismissed a native title claim by the Wutha People, which had been registered in 1998, which also covered and are including a significant portion of the Agnew operations.

Agnew consults with all relevant stakeholder groups to ensure that Aboriginal cultural heritage sites are identified and recorded. The sites identified during these surveys may be both archaeological (e.g., artefacts) or ethnographic (e.g., an area linked to a story line). Such sites are recorded and managed in accordance with the Western Australian Aboriginal Heritage Act (1972) under site procedures and standards.

The Agnew / Lawlers area has a history of European mining activities dating back to 1895 with the Lawlers town gazetted in 1896 and Agnew in 1936. Historical remains including a magazine, jail, cemetery, stamp batteries and headframe are managed by both Agnew and the local government.

There are currently no agreements in place with pastoralists, landowners or any other local groups or stakeholder.

Ongoing support for host communities across the region includes health improvement and school retention programmes, support of regional community events, host community and Indigenous procurement and employment opportunities, and the promotion of STEM (science, technology, engineering and mathematics) at schools.

Agnew has an internal scorecard to ensure host community procurement and hiring.

Gold Fields has partnered with Football West as a major sponsor. The commitment and support to Football West is based on its impressive record of growth of the sport in Western Australia, its commitment and focus on a regional level, cultural diversity, inclusiveness and gender diversity.

Gold Fields is also a founding member of the Gold Industry Group that represents the interests of gold producers, explorers and service providers to collectively champion, educate and promote the importance of the gold sector in Australia.

17.5 Mine closure

Agnew has an up-to-date mine closure plan, approved by Department of Mines, Industry Regulation and Safety (DMIRS) in 2021. The plan has been developed in accordance with legal requirements and Gold Fields guidance, which aligns with the International Council of Mining and Minerals (ICMM) guidance The Mine Closure Plan determines the mine closure requirements and calculates the financial or closure cost liability associated with closure. The Mine Closure Plan identifies the baseline description, the closure vision or objectives, risks and opportunities, and closure activities, which include stakeholder engagement, decontamination, dismantling, re-profiling and revegetation of land or landforms, maintenance and monitoring, including post closure water monitoring (after rehabilitation is completed).

The operation has a Progressive Rehabilitation Plan (PRP), developed in accordance with the approved Mine Closure Plan and Group guidance. The operation sets annual targets for the implementation of the PRP and tracks their performance against these targets. These include the recent Lawlers tailings storage facility rehabilitation, Fairyland mine precinct rehabilitation and the remedial rehabilitation of the New Holland waste rock landform. Monitoring of closure objectives is undertaken utilising an in-house Closure Monitoring Protocol. Monitoring data and results are reported annually as part of Agnew's Annual Environmental Report. Existing cash resources are utilised to fund the progressive rehabilitation activities. Agnew, as a tenement holder, is required to report disturbance data, and to contribute annually to the Mining Rehabilitation Fund (MRF) in accordance with the requirements of the Mining Act.

Agnew have developed their closure cost estimate using the Standardised Reclamation Cost Estimator (SRCE) model. Closure costs are reviewed every year to reflect actual and proposed disturbances and changes in closure requirements. The estimated closure cost for Life of Mine is calculated, as of 31 December 2021, as US$ 47m [Au$ 65m * 0.7275 for conversion] (excluding taxes). Financial provision for rehabilitation, closure and post closure obligations are met through existing cash reserves. The SRCE closure cost estimate, developed for asset retirement obligation purposes, is updated and reviewed, externally, every two years by an independent consultant, and reviewed annually as part of the Group financial assurance.

18 Capital and operating costs

18.1 Capital costs

Capital costs for Agnew are based on items incorporated in the life of mine plan to secure the Mineral reserve stated as at 31 December 2021.

Major budgeted capital expenditure items for 2021 include underground works, access developments for extensions, additional drilling including the Sheba South 811 drill drive, Sheba vent upgrade, Kath vent upgrade, Kath access and decline, and mining studies. Exploration expenditure is also required for the growth and resource/reserve conversion pipeline. The forecast capital expenditure costs are summarized in Table 18.1.1.

Table 18.1.1: Capital costs ($ million)

Capital cost item	Units	2022	2023	2024	2025	2026	2027
Mining MP&Dev	$ million	49.4	23.3	30.1	16.6	7.7	0
Mining Capital Works	$ million	11.6	38.9	24.5	11.7	3.7	0.3
Processing (including TSFs)	$ million	18.6	3.1	3.3	1.3	0.7	0.4
G&A Capital	$ million	7.0	2.8	3.5	1.8	0	0
Exploration	$ million	1.0	1.0	1.0	1.0	1.0	1.0
Capital costs	$ million	87.5	69.2	62.3	32.3	13.2	1.7

Notes:
a) The capital costs are based on the 31 December 2021 life of mine schedule for proven and probable reserves.
b) No inferred Mineral resource is included in the life of mine processing schedule or techno-economic evaluation.
c) Exploration costs are limited to year one in the life of mine cash flow model. Gold Fields is expecting to spend between $80 million and $100 million per annum on reserve generation exploration to replace depletion with approximately a quarter share going to Agnew.
d) Closure cost is 'Day of Assessment' as at 31 December 2021 with subsequent life of mine disturbance rehabilitation added.
e) Tailing storage facilities are costed according to the life of mine requirements. The current in-pit tailings storage facility is expected to have reached capacity before the reserve life of mine is consumed. The cost of the replacement facility is included in the life of mine financial model.

Source: Agnew CPR, 2021

18.2 Operating costs

Budgeted operating costs for the 31 December 2021 Mineral reserve LoM plan are summarized in Table 18.2.1.

Table 18.2.1: Operating costs ($ million)

Operating cost item	Units	2022	2023	2024	2025	2026	2027
Mining	$ million	115.7	103.6	85.8	45.9	31.1	16.4
Processing	$ million	28.5	25.9	26.3	21.9	15.8	8.8
General and administrative (G&A)	$ million	33.5	29.9	30.4	21.5	19.1	8.6
Other operating costs	$ million	5.2	4.3	4.1	2.3	1.2	0.6
Operating costs	$ million	183.0	163.7	146.7	91.5	67.2	34.3

Notes:
a) The operating costs are based on the 31 December 2021 life of mine schedule for proven and probable reserves. The Mineral resource and exploration required to replace depleted reserves is no included in this techno-economic assessment
b) No inferred Mineral resource is included in the life of mine processing schedule or techno-economic evaluation
c) Costs are first principles based on the Mineral reserve life of mine schedule
d) This operating cost summary estimate is for the Mineral reserve life of mine schedule
e) The operating costs also include rehabilitation and closure costs of $54.7 million, inclusive of the additional provision for new open pits, and power station and equipment leasing costs of $2.9 million must be US$

Source: Agnew CPR, 2021

Budgeted closure costs for post the 31 December 2021 Mineral reserve LoM plan are summarized in Table 18.2.2.

Table 18.2.2: Post LoM costs

Sources	Units	2028	2029	2030	2031	2032	2033 Onwards
Post Reserve LoM Closure	$ million	8.7	6.4	4.2	2.2	0.3	1.6
Property Holding Costs*	$ million	2.9					

Notes: * Costs included in closure costs
Source: Agnew CPR, 2021

The Qualified person's opinion on capital and operating costs is summarized below:

(a) The financial schedule is wired to the life of mine plan to ensure the provision of capital is linked to when the major budgeted items require to be funded

a) The capital, operating and closure cost estimation levels of accuracy meet the minimum pre-feasibility study requirements at an estimated accuracy of ±25 % and require no more than 15 % contingency. The specific engineering estimation methods have an accuracy equal to or better than this range.

b) Agnew has improved capital estimation and capital delivery through the application of Group Capital Standards and capital projects review by a select team with improved implementation planning. Gold Fields also perform post investment reviews across all major capital studies and share key learnings.

c) Gold Fields' two-year business planning cycle captures operating and capital costs along with key physicals and revenue. The business plans are internally reviewed, presented to the Executive Committee for approval, prior to sanctioning by the Gold Fields board of directors. The business plans are aligned with the Registrant's strategic direction and equate to the first two years of the life of mine plan.

d) Capital expenditure, once sanctioned, must follow the company capital reporting standard. Monthly and quarterly reviews are held to assess capital programmes, operating unit costs, mine physicals, plan execution and revenue streams.

e) Operating unit costs are based on recent valid historical performance and where necessary take account of future changing circumstances that are anticipated to impact future operating costs

19 Economic analysis

19.1 Key inputs and assumptions

Under the 31 December 2021 Mineral reserve LoM plan, the Agnew processing facility is not at full capacity for the full life of the operation. A portion of incrementally costed material is included, which supplements the fully costed feed but does not extend the life of the operation. The mining of the incremental material covers the full unit cost of mining, the variable unit costs of processing, rehabilitation and closure, and positively contributes to fixed overheads and off-site costs. Detailed assessments were undertaken, with iterative reviews prior to inclusion of this material in the 6-year LoM plan.

The Mineral reserve life of mine physical inputs are summarised in Table 19.1.1.

Table 19.1.1: LoM physical, operating cost and capital cost inputs and revenue assumptions 100 % basis

Sources		Units	2022	2023	2024	2025	2026	2027
Underground	LoM Processed	koz	256.3	227.0	217.1	109.3	113.0	47.4
	Recovery	%	95.0 %	91.8 %	93.4 %	94.4 %	93.7 %	96.0 %
	Sold	koz	243.6	208.4	202.8	103.2	105.8	45.5
Open Pit	LoM Processed	koz	5.0	5.5	16.0	16.7		
	Recovery	%	96.0 %	94.2 %	90.4 %	96.0 %		
	Sold	koz	4.8	5.2	14.5	16.1		
Stockpiles	LoM Processed	koz	3.48					
	Recovery	%	96.0 %					
	Sold	koz	3.34					
	Total Sold pa	koz	251.8	213.6	217.3	119.3	105.8	45.5
Costs, Revenue and Cash flow	Revenue	$ million	327.7	277.7	282.5	155.1	137.6	59.1
	Operating Costs	$ million	183.0	163.7	146.7	91.5	67.2	34.3
	Capital Costs	$ million	87.5	69.2	62.3	32.3	13.2	1.7
	Other	$ million	30.3	27.9	24.7	31.8	26.3	61.9
	Royalties	$ million	9.0	8.4	8.5	7.0	5.1	2.1
	Government levies	$ million						
	Interest (if applicable)	$ million						
	Costs	$ million	309.8	269.1	242.1	162.6	111.8	100.0
	Taxes	$ million	0.0	4.1	16.4	0.0	0.0	0.0
	Cash flow	$ million	17.9	4.5	24.0	-7.6	25.8	-40.9
	Discounted cash flow at 3.8 % (NPV)	$ million	17.9	4.3	22.3	-6.8	22.2	-33.9

Notes: a) The capital costs are based on the 31 December 2021 life of mine schedule for proved and probable Reserve only. The Mineral resource and exploration required to replace dealation is no included in this techno-economic assessment

b) No Inferred Mineral resource is included in the life of mine processing schedule or techno-economic evaluation

Source: Agnew CPR, 2021

The economic assumptions on which the analysis is based include:

- The reserve gold price of $1,300/oz for the entire reserve life of mine.
- A state royalty rate of 2.5 %.
- A corporate tax rate of 30 %.
- Assessed losses and capital expenditure being offset against corporate taxes as Gold Fields' Australian operations are considered as a unit for taxation purposes.
- A real, base case discount rate of 3.8 % as determined by Gold Fields Corporate Finance on an annual basis.
- The discounted cash flow (DCF) being applied to annual post-tax, pre-finance cash flows reported in financial years ending December.

The life of mine operating and capital cost inputs, including rehabilitation, leasing and closure costs, and revenue assumptions for the economic analysis are summarized in Table 19.1.2.

Table 19.1.2 has the breakdown of ESG expenditure included in Table 18.1.1, Table 18.2.1 and Table 19.1.1

Table 19.1.2: LoM cost and revenue assumptions – Breakdown of ESG

Sources	Units	2022	2023	2024	2025	2026	2027
Progressive Closure	$ million	10.0	6.9	6.8	8.5	8.0	2.9

Source: Agnew Techno-economic analysis, 2021 Table 19.1

No decarbonization costs are included because a renewable power source has already been established

19.2 Economic analysis

The NPV for Agnew based on the DCF forecast using the scheduled Mineral reserves for the life of the project is $23.7 million.

19.3 Sensitivity analysis

Sensitivity analyses were performed to ascertain the impact on NPV to changes in capital, operating costs, discount rate and gold price as summarized in Table 19.3.1 to Table 19.3.4.

Table 19.3.1: NPV sensitivity to changes in gold price

Gold price – real	-15 %	-10 %	-5 %	0 %	+5 %	+10 %	+15 %	+25 %	+31 %
Gold Price	1,105	1,170	1,235	1,300	1,365	1,430	1,495	1,625	1,700
NPV ($ million)	-126.6	-70.1	-20.6	23.7	65.6	105.9	146.2	226.7	273.2

Source: Agnew CPR, 2021

Table 19.3.2: NPV sensitivity to changes in grade

Grade	-15 %	-10 %	-5 %	0 %	+5 %	+10 %	+15 %
NPV ($ million)	-124.9	-69.0	-20.2	23.7	65.3	105.2	145.1

Source: Agnew CPR, 2021

Table 19.3.3: NPV sensitivity to changes in capital costs

Capital costs	-15 %	-10 %	-5 %	0 %	+5 %	+10 %	+15 %
NPV ($ million)	53.1	43.8	33.8	23.7	13.1	2.6	-7.9

Source: Agnew CPR, 2021

Table 19.3.4: NPV sensitivity to changes in operating costs

Operating costs	-15 %	-10 %	-5 %	0 %	+5 %	+10 %	+15 %
NPV ($ million)	93.9	71.0	48.1	23.7	-1.7	-27.0	-53.9

Source: Agnew CPR, 2021

Table 19.3.5: NPV sensitivity to changes in discount rate

Discount rate	2 %	3 %	3.8 %	5 %
NPV ($ million)	22.4	23.2	23.7	24.4

Source: Agnew CPR, 2021

The Qualified person is of the opinion that the tecno-economic model based on the Mineral reserve physicals. The Recent historic assumptions are used to test the Mineral reserve economic assumptions. The material assumptions have been found to be valid and used in the tecno-economic studies. The discounted cash flow has economic viability and a NPV of US$23.7 million at a discount rate of 3.8 %. The IRR has not been presented for this tecno-economic study.

The tecno-economic study for the Mineral reserves excludes all inferred Mineral resource material.

20 Adjacent properties

The Qualified person is unable to verify the information listed for the properties adjacent to Agnew and that the information is not necessarily indicative of the mineralisation on the property that is the subject of this technical report summary. Agnew is essentially stand alone and has no or little reliance of neighbouring properties and the proximity of workings are not expected to interact in any way with Agnew and the lease and permit areas are not overlapping.

The Bellevue gold deposit owned by Bellevue Gold Ltd (ASX: BGL) is a material adjacent property to the immediate north of Agnew. The gold deposit currently hosts an indicated Mineral resource of 3.9 Mt at 11.0 g/t Au for 1.4 million contained ounces and an inferred Mineral resource of 5.6 Mt at 9.0 g/t Au for 1.6 million contained ounces (refer to BGL's ASX announcement dated 8 July 2021). The mineralisation is described by Bellevue Gold as auriferous quartz veins ± sulphides that range from steeply west dipping to shallowly dipping with an overall north-south strike direction. The lodes are associated with a north-northwest trending series of regional shear zones within basalt and are occasionally offset by a series of late-stage, east-trending normal faults and low angle shears.

Bellevue Gold completed a Stage 1 feasibility study in February 2021 reporting a probable Mineral reserve of 2.7 Mt at 8.0 g/t Au for 690,000 oz and forecasted average annual gold production from underground of 151,000 oz/a over an initial 7.4 year mine life (refer to BGL's ASX announcement dated 18 February 2021).

Ramelius Resources Ltd (ASX: RMS) is currently mining the Vivien gold deposit located 6.5km to the northeast of the Agnew processing facility. The deposit was acquired from Gold Fields in September 2013 with underground mining below the former open pit commencing in May 2015. The most recent published Mineral reserve for Vivien was a proved and probable reserve of measured 250,000 t @ 6.1 for 48 000 oz, indicated 240,000 t @ 5.1 40,000 oz (refer to RMS' ASX announcement dated 28 September 2020).

Ramelius Resources describes the Vivien mineralisation as occurring within a high-grade quartz vein hosted by a dolerite-gabbro unit. The vein trends north-northeast and dips steeply to the southeast. The quartz vein averages 2.7 m in width and has significant strike and dip continuity (approximately 500 m). The high-grade zones are generally wider and sulphide rich, with pyrrhotite and arsenopyrite being the dominant sulphide species.

The Qualified person is unable to verify the publicly disclosed information pertaining to the Bellevue and Vivien gold deposits and notes that this information is not necessarily indicative of the mineralisation within the Agnew property which is mostly concentrated on the western limb of the Lawlers Anticline and is the subject of this technical report summary. To the best of the Qualified persons knowledge, there is no evidence for the gold mineralisation within these adjacent properties extending into the Agnew property.

The area immediately surrounding Agnew is also host to several significant deposits of nickel sulphide mineralisation currently being mined by:

- BHP Billiton Nickel West Pty Ltd at Rockys Reward and Venus some 15km to the north of Leinster.
- Western Areas Ltd (ASX: WSA) at Odysseus to the immediate north of Agnew.

Liontown Resources Ltd (ASX: LTR) has recently completed a pre-feasibility study on its Kathleen Valley lithium-tantalum project to the north of Odysseus.

These non-gold projects are not considered by the Qualified person to be material to Gold Fields.

21 Other relevant data and information

Gold Fields' commitment to materiality, transparency and competency in its Mineral resources and Mineral reserves disclosure to regulators and in the public domain is of paramount importance to the Qualified person and the registrants Executive Committee and Board of Directors continue to endorse the company's internal and external review and audit assurance protocols. This Technical Report Summary should be read in totality to gain a full understanding of Agnew's Mineral resource and Mineral reserve estimation and reporting process, including data integrity, estimation methodologies, modifying factors, mining and processing capacity and capability, confidence in the estimates, economic analysis, risk and uncertainty and overall projected property value.

However, to ensure consolidated coverage of the company's primary internal controls in generating Mineral resource and reserve estimates the following key point summary is provided:

(a) A comprehensive quality assurance and quality control (QA/QC) protocol is embedded at Agnew and all Gold Fields operations. It draws on industry leading practice for data acquisition and utilises national standards authority accredited laboratories which are regularly reviewed. Analytical QA/QC is maintained and monitored through the submission of sample blanks, certified reference material and duplicates and umpire laboratory checks.

a) Corporate Technical Services (CTS), based in Perth, comprises subject matter experts across the disciplines of geology, resource estimation, geotechnical, mining, engineering, modernisation, capital projects, processing, metallurgy, tailings management and Mineral resource and reserve reporting governance. The Corporate Technical Services (CTS) team budget for regular site visits to all operating mines when emphasis is placed on-site inspection and direct engagement with the technical staff to drive protocols and standards and enable on-site training and upskilling. Corporate Technical Services (CTS) provides technical oversight and guidance to the operating Regions and mines and ensures an additional level of assurance to the Mineral resource and reserve estimates to supplement the mine sites and Regional technical teams.

b) Independent audit review of fixed infrastructure is conducted annually with the appointed insurance auditor focused on plant, machinery and mine infrastructure risks. An effective structural and corrosion maintenance programme with benchmark inspections is in place supported by equipment condition monitoring major critical component spares. Focus areas include the primary jaw crusher, ball mill shell or motor failure, structural failure of plant or conveyor, process tank failure and large transformer failure. Critical spares are well resourced and there are no large items not supported by on-site spares holdings.

c) Mobile equipment is largely owned and well maintained by the mining contractor, Barminco, with development and haulage units at New Holland owned by Agnew. There is some spare capacity in most of the fleets or within the Barminco group, or hire units are readily available in the region.

d) Processing controls include the preparation of quarterly plant metal accounting reconciliation reports by the mine sites which are reviewed by the Regional Metallurgical Manager and VP Metallurgy in the Corporate Technical Services (CTS) team. Any monthly reconciliation variance outside the limits provided within the Gold Fields Plant Metal Accounting Standard is flagged for follow up assessment and remediation if warranted.

e) Agnew has a tailings management plan that promotes risk minimisation to operators and stakeholders over the lifecycle of each tailings storage facility (TSF). Agnew's TSFs are operated in accordance with the company TSF Management Guidelines, which are aligned with the International Council on Metals & Mining's (ICMM) Position Statement on preventing catastrophic failure of TSFs (December 2016). Active TSFs are subject to an independent, external audit every three years and regular inspections and formal dam safety reviews by formally appointed Engineers of Record (EoR). Further improvements in tailings management are expected to achieve conformance to the new independently developed Global Industry Standard for Tailings Management (GISTM) issued in 2020.

f) The integration of environmental, social and governance (ESG) themes into the estimation process continues as an important consideration for modifying factors, reasonable prospects for economic extraction (RPEE) assessments and to underpin the integrity of the Mineral resources and Mineral reserves. The company's ESG Charter, issues and priorities are fully considered in the life of mine plan with particular emphasis on tailings

management, integrated mine closure planning, security of energy and water and the social and regulatory licence to operate.

g) Gold Fields also follows an embedded process of third-party reviews to provide expert independent assurance regarding Mineral resource and Mineral reserve estimates and compliance with relevant reporting rules and codes. In line with Gold Fields policy, every material property is reviewed by an independent third-party on average no less than once every three years, or when triggered by a material year-on-year change. Certificates of compliance are received from the companies that conduct the external audits which are also configured to drive continuous improvement in the estimation process.

h) Importantly, Gold Fields endorses a well embedded risk and control matrix (RACM) configured to provide an annual assessment of the effectiveness of the registrants' internal controls concerning the life of mine planning process and Mineral resource and reserve estimation and reporting.

i) The internal controls include coverage of the following (inter alia):

   i Reasonableness of parameters and assumptions used in the Mineral resource and reserve estimation process

   ii Reasonableness of the interpretations applied to the geological model and estimation techniques

   iii Integrity in the mine design and scheduling, including reasonableness of the mine planning assumptions, modifying factors, cut-off grades, mining and processing methods and supporting key technical inputs such as year on year reconciliation, geotechnical, mining equipment, infrastructure, water, energy and economic analysis

   iv Provision of the necessary skills, experience and expertise at the mine sites and the Regions to undertake and complete the work with the required level of technical ability and competency, including professional registration as a Qualified person

   v Alignment with the SK 1300 rule (guidance and instruction) for the reporting of Mineral resources and reserves

   vi Review of the disclosure of the registrants' Mineral resources and reserves process.

j) Because of its inherent limitations, internal controls may not prevent or detect all errors or misstatements. Also, projections of any valuation of effectiveness to future periods are subject to risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with policies and procedures may deteriorate.

RCubed® is a proprietary cloud-based reporting system adopted by Gold Fields in 2021 to enhance the level governance and data security concerning Mineral resource and reserve reporting across all company properties. It ensures transparency and auditability for all data verification checks, information stage gating, the approvals process and confirmation of Qualified person credentials. The RCubed® reporting system is being incorporated into the SOX RACM matrix to support the December 2021 Mineral resource and reserve reporting.

22 Interpretation and conclusions

The views expressed in this technical report summary are based on the fundamental assumption that the required management resources and management skills are in place to achieve the Mineral reserve LoM plan projections for Agnew. The Agnew Mineral reserves currently support a 5-year life of mine plan that values the operation at $23.7 million at the reserve gold price of $1,300/oz.

Climate change is an integral part of the Mineral reserve generation process and incorporating relevant costs associated with climate change, primarily decarbonisation, mitigation and adaptation to the changing climate, is a key theme for the Company. Integration of these key elements into the Mineral reserve process is being carried out progressively and simultaneously across all of Gold Fields' sites. Agnew has a solar farm and wind generating capacity as core aspects of its decarbonization strategy.

The Mineral reserve estimates contained in this report should not be interpreted as assurances of the economic life or the future profitability of Agnew. Mineral reserves are only estimates based on the factors and assumptions described herein, thus future Mineral reserve estimates may need to be revised. For example, if production costs increase or product prices decrease, a portion of the current Mineral resources, from which the Mineral reserves are derived, may become uneconomic and would therefore result in a lower estimate of Mineral reserves. The LoM plans include forward-looking technical and economic parameters and involve a number of risks and uncertainties that could cause actual results to differ materially.

The LoM plan for Agnew has been reviewed in detail by the Qualified person for appropriateness, reasonableness and viability, including the existence of and justification for departure from historical performance. The Qualified person considers that the Technical Economic Parameters and Financial Models are based on sound reasoning, engineering judgement and technically achievable mine plan, within the context of the risk associated with the gold mining industry.

The business of gold mining by its nature involves significant risks and hazards, including environmental hazards and industrial accidents. In particular, hazards associated with Gold Fields' underground mining operations include:

- Rock bursts.
- Seismic events.
- Underground fires and explosions.
- Cave-ins or gravity falls of ground.
- Discharges of gases and toxic substances.
- Flooding.
- Accidents related to the presence of mobile machinery.
- Ground and surface water pollution.
- Ground subsidence.
- Other accidents and conditions resulting from drilling, blasting and removing and processing material from an underground mine.

Hazards associated with Gold Fields' rock dump, production stockpile mining and tailings deposition include:

- Accidents associated with operating a rock dump and production stockpile, and rock transportation equipment.
- Production disruptions due to weather.
- Ground and surface water pollution.

Gold Fields is at risk of experiencing any of these environmental or industrial hazards. The occurrence of any of these hazards could delay or halt production, increase production costs and result in a liability for Gold Fields.

The major risks and mitigation actions at Agnew based on a formal risk review and assessment using risk ranking software are summarized in Table . Senior management review and update the risk register on routine basis which is reported on a quarterly basis.

Table 22.1.1: Agnew risks and mitigating actions

Risk description		Risk mitigating action
Revenue:	Gold Fields does at times enter into forward sales, derivatives or other hedging arrangements in order to establish a price in advance of the sale of its gold production. These decisions are based on the strategic vision of the company as a whole dependent on many factors.	Industry data about Gold Fields' markets obtained from industry surveys, industry publications, market research and other publicly available third-party information. In many cases, statements in this report regarding the gold mining industry and price have been made based on internal surveys, industry forecasts, market research, as well as Gold Fields' own experiences. Risk mitigation includes price sensitivity analyses at a range of gold prices.
Exploration:	Exploration activities are focused on replacing production depletion and on growth in Mineral reserves to maintain operational flexibility and sustainability. Exploration for gold and other metals associated with gold are speculative in nature involves many risks and is frequently unsuccessful.	The Company focuses on the extension of existing orebodies and the discovery and delineation of new ore bodies both at existing sites and at undeveloped sites. Best practices exploration techniques, technical peer reviews and technical specialists are employed to assist in conceptual targeting, execution and interpretation of the exploration programmes. Geological, geochemical, geophysical, geostatistical and geo-metallurgical techniques are constantly refined to improve effectiveness and the economic viability of prospecting and mining activities. Once a potential orebody has been discovered, exploration is extended and intensified in conjunction with comprehensive infill drilling to enable clearer definition of the orebody and its technical and economic probability. Reserves published do not require any additional discovery.
Geology & estimation:	The primary assumptions of continuity of the geologically homogenous zones are driven by the geological model, which is updated when new information arises. Any changes to the model are subject to peer and internal technical corporate review and external independent consultant review when deemed necessary.	At the Australian operations, the estimation of Mineral reserves for both underground and open pit operations is based on exploration and sampling information gathered through appropriate techniques, primarily from DD, RC and AC drilling techniques. Gold Fields and the sites have well documented processes, procedures and systems to ensure the drilling, logging, sampling, interpretation, orebody and lithological modelling, and estimation are appropriately completed. Overall staff focus is on geology recruitment with required expertise and skills, training, coupled with field and peer reviews by both site and corporate staff integrated into routine exploration and mining geology. Internal and external corporate audits, procedures and systems all enhance and support ongoing periodic review. All models are documented with peer reviews and model on model reconciliations to explore and understand the impacts of additional information, data and interpretation / methodology to support delivery of the most appropriate and best-informed outcomes Applications of alternative estimation methods to evaluate deposits are also routinely compiled to ensure the most relevant and appropriate estimation for mine planning is delivered. This may include considering OK, SK, and simulation. Conditional estimation techniques to validate and inform options and decisions are also considered. The locations of sample points are spaced close enough to deduce or confirm geological and grade continuity. Generally, drilling is undertaken on grids, which range between 10 m by 10 m up to 40 m by 40 m, although this may vary depending on the continuity of the orebody. Due to the variety and diversity of mineralisation at the Australian operations, sample spacing may also vary depending on each particular ore type.
Mine planning & scheduling	Changes in assumptions underlying Gold Fields' Mineral reserve estimates risk.	Modifying factors used to calculate the cut-off grades include adjustments to mill delivered amounts due to dilution and ore loss

Risk description		Risk mitigating action
		incurred in the course of mining, expected return on investment, and sustaining capital. These may change but typically are reviewed and managed through detailed reconciliation processes to minimize variations and impacts. Modifying factors applied in estimating reserves are primarily based on historical empirical information, but commonly incorporate adjustments for planned operational improvements. Mineral reserves also take into account operating cost levels as well as necessary capital and sustaining capital provisions required at each operation and are supported by life of mine plans. Detail planning protocols and review processes by qualified and experienced technical staff both on site and regional levels are held to ensure consistency and applicability of due process.
Mining execution	The ability to achieve anticipated efficiencies and production plans due to nature of risk and impacts associated with normal mining routine activities. These could include geotechnical, equipment and maintenance, explosives, staffing, power and water supply.	Benchmarking and technical reviews of all mine plans to validate and test assumptions are normal Mineral resource & reserve processes. Assumptions applied in estimating mine planning for Mineral reserves are primarily based on historical empirical information, but commonly incorporate adjustments for planned operational performance. Geotechnical evaluation and monitoring, seismic systems and open cut slope wall rock monitoring are all normal processes to mitigate risk. Equipment planned schedule and maintenance programmes and condition monitoring processes are in place to ensure production capability.
Social licence to operate:	Many mining companies face increasing pressure over their "social licence to operate" which can be understood as the acceptance of the activities of these companies by local stakeholders. While formal permission to operate is ultimately granted by host governments, many mining activities require social permission from host communities and influential stakeholders to carry out operations effectively and profitably. This aspect could impact future Mineral reserves & resources mining activity and delivery.	To maintain its social licence to operate, Gold Fields may need to design or redesign parts of its mining operations to minimize their impact on such communities and the environment, either by changing mining plans to avoid such impact, by modifying operations, changing planned capital expenditures or by relocating the affected people to an agreed location. Responsive measures may require Gold Fields to take costly and time-consuming remedial measures, including the full restoration of livelihoods of those impacted.
Staffing & technical capability:	Gold Fields' ability to operate or expand effectively depends largely on the experience, skills and performance of its senior management team and technically skilled employees.	Gold Fields operates in a good labour market and stable political jurisdiction which adapts recruitment, staff development / retention policies to meet labour and staffing demand to support and deliver on operations.
Environmental and industrial accidents:	Gold mining by its nature involves significant risks and hazards, including environmental hazards and industrial and mining accidents. These may include, for example, seismic events, fires, cave-ins and blockages, flooding, discharges of gases and toxic substances, contamination of water, air or soil resources, radioactivity and other accidents or conditions resulting from mining activities including, among other things, blasting and the transport, storage and handling of hazardous materials.	Gold Fields has appropriate staffing structures and processes and programmes which manage, monitor and report on key environmental, health and safety compliance. Gold Fields also subscribes to a number of international regulatory frameworks (e.g., ISO14001, ISO18001, ISO45001, Cyanide Code) which include process and external audits review and monitoring for compliance.

Notes: a) The Qualified person is of the opinion that the risks identified have reasonable risk mitigations and that action plans current and future will not materially affect the life of mine reserve estimation

Source: Agnew CPR 2021

23 Recommendations

The Agnew Mineral reserves currently support a 6-year LoM plan that values the operation at $23.7 million at the reserve gold price of $1,300/oz. It is recommended that further exploration is carried out at the Waroonga Complex, New Holland Complex and the Redeemer Complex which has a good probability of extending mine life.

24 References

The primary reference documents that have written consent by the appointed Gold Fields Lead Qualified persons technical report summary are.

Primary reference is the Agnew Competent Person Report 31 December 2021 for Mineral resources and Mineral reserves. This report has written consent from Pieter Burge who is the Gold Fields appointed Lead Competent Person or Qualified person for Agnew Gold Mine. Peter has accepted responsibility for the Competent Person Report 31 December 2021 for Mineral resources and Mineral reserves as a whole.

The Agnew Competent Person Report 31 December 2021 for Mineral resources and Mineral reserves is referred to in this document as "Agnew CPR 2021".

25 Reliance on information provided by the registrant

The competent person has not identified any information provided by the registrant for Agnew that requires noting under the reliance on information provided.

26 Definitions

26.1 Adequate geological evidence

When used in the context of Mineral resource determination, means evidence that is sufficient to establish geological and grade or quality continuity with reasonable certainty.

26.2 Conclusive geological evidence

When used in the context of Mineral resource determination, means evidence that is sufficient to test and confirm geological and grade or quality continuity.

26.3 Cutoff grade

Is the grade (i.e., the concentration of metal or mineral in rock) that determines the destination of the material during mining. For purposes of establishing "prospects of economic extraction," the cutoff grade is the grade that distinguishes material deemed to have no economic value (it will not be mined in underground mining or if mined in surface mining, its destination will be the waste dump) from material deemed to have economic value (its ultimate destination during mining will be a processing facility). Other terms used in similar fashion as cutoff grade include net smelter return, pay limit, and break-even stripping ratio.

26.4 Development stage issuer

Is an issuer that is engaged in the preparation of Mineral reserves for extraction on at least one Material property.

26.5 Development stage property

Is a property that has Mineral reserves disclosed, pursuant to this subpart, but no material extraction.

26.6 Economically viable

When used in the context of Mineral reserve determination, means that the Qualified person has determined, using a discounted cash flow analysis, or has otherwise analytically determined, that extraction of the Mineral reserve is economically viable under reasonable Investment and market assumptions.

26.7 Exploration results

Are data and information generated by mineral exploration programs (i.e., programs consisting of sampling, drilling, trenching, analytical testing, assaying, and other similar activities undertaken to locate, investigate, define or delineate a mineral prospect or mineral deposit) that are not part of a disclosure of Mineral resources or Mineral reserves. A Registrant must not use exploration results alone to derive estimates of tonnage, grade, and production rates, or in an assessment of economic viability.

26.8 Exploration stage issuer

Is an issuer that has no Material property with Mineral reserves disclosed.

26.9 Exploration stage property

Is a property that has no Mineral reserves disclosed.

26.10 Exploration target

Is a statement or estimate of the exploration potential of a mineral deposit in a defined geological setting where the statement or estimate, quoted as a range of tonnage and a range of grade (or quality), relates to mineralisation for which there has been insufficient exploration to estimate a Mineral resource.

26.11 Feasibility study

Is a comprehensive technical and economic study of the selected development option for a mineral project, which includes detailed assessments of all applicable Modifying factors, as defined by this section, together with any other relevant operational factors, and detailed financial analysis that are necessary to demonstrate, at the time of reporting, that extraction is Economically viable. The results of the study may serve as the basis for a final decision by a proponent or financial institution to proceed with, or finance, the development of the project.

1. A feasibility study is more comprehensive, and with a higher degree of accuracy, than a Preliminary feasibility study (or pre-feasibility study). It must contain mining, infrastructure, and process designs completed with sufficient rigor to serve as the basis for an investment decision or to support project financing.
2. The confidence level in the results of a feasibility study is higher than the confidence level in the results of a Preliminary feasibility study (or pre-feasibility study). Terms such as full, final, comprehensive, bankable, or definitive feasibility study are equivalent to a feasibility study.

26.12 Final market study

Is a comprehensive study to determine and support the existence of a readily accessible market for the mineral. It must, at a minimum, include product specifications based on final geologic and metallurgical testing, supply and demand forecasts, historical prices for the preceding five or more years, estimated long term prices, evaluation of competitors (including products and estimates of production volumes, sales, and prices), customer evaluation of product specifications, and market entry strategies or sales contracts. The study must provide justification for all assumptions, which must include assumptions concerning the Material contracts required to develop and sell the Mineral reserves.

26.13 Indicated Mineral resource

Is that part of a Mineral resource for which quantity and grade or quality are estimated on the basis of Adequate geological evidence and sampling. The level of geological certainty associated with an indicated Mineral resource is sufficient to allow a Qualified person to apply Modifying factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Because an indicated Mineral resource has a lower level of confidence than the level of confidence of a Measured Mineral resource, an indicated Mineral resource may only be converted to a Probable Mineral reserve.

26.14 Inferred Mineral resource

Is that part of a Mineral resource for which quantity and grade or quality are estimated on the basis of Limited geological evidence and sampling. The level of geological uncertainty associated with an inferred Mineral resource is too high to apply relevant technical and economic factors likely to influence the prospects of economic extraction in a manner useful for evaluation of economic viability. Because an inferred Mineral resource has the lowest level of geological confidence of all Mineral resources, which prevents the application of the Modifying factors in a manner useful for evaluation of economic viability, an inferred Mineral resource may not be considered when assessing the economic viability of a mining project, and may not be converted to a Mineral reserve.

26.15 Initial assessment

Is a preliminary technical and economic study of the economic potential of all or parts of mineralisation to support the disclosure of Mineral resources. The initial assessment must be prepared by a Qualified person and must include appropriate assessments of reasonably assumed technical and economic factors, together with any other relevant operational factors, that are necessary to demonstrate at the time of reporting that there are reasonable prospects for economic extraction. An initial assessment is required for disclosure of Mineral resources but cannot be used as the basis for disclosure of Mineral reserves.

26.16 Investment and market assumptions

When used in the context of Mineral reserve determination, includes all assumptions made about the prices, exchange rates, interest and discount rates, sales volumes, and costs that are necessary to determine the economic viability of the

Mineral reserves. The Qualified person must use a price for each commodity that provides a reasonable basis for establishing that the project is Economically viable.

26.17 Limited geological evidence

When used in the context of Mineral resource determination, means evidence that is only sufficient to establish that geological and grade or quality continuity are more likely than not.

26.18 Material

Has the same meaning as under Part 230.405 or Part 240.12b-2.

The term material, when used to qualify a requirement for the furnishing of information as to any subject, limits the information required to those matters to which there is a substantial likelihood that a reasonable investor would attach importance in determining whether to purchase the security registered.

26.19 Material of economic interest

When used in the context of Mineral resource determination, includes mineralisation, including dumps and tailings, mineral brines, and other resources extracted on or within the earth's crust. It does not include oil and gas resources resulting from oil and gas producing activities, as defined in Part 210.4-10(a)(16)(i) of this chapter, gases (e.g., helium and carbon dioxide), geothermal fields, and water.

26.20 Measured Mineral resource

Is that part of a Mineral resource for which quantity and grade or quality are estimated on the basis of Conclusive geological evidence and sampling. The level of geological certainty associated with a measured Mineral resource is sufficient to allow a Qualified person to apply Modifying factors, as defined in this section, in sufficient detail to support detailed mine planning and final evaluation of the economic viability of the deposit. Because a measured Mineral resource has a higher level of confidence than the level of confidence of either an Indicated Mineral resource or an Inferred Mineral resource, a measured Mineral resource may be converted to a Proven Mineral reserve or to a Probable Mineral reserve.

26.21 Mineral reserve

Is an estimate of tonnage and grade or quality of Indicated Mineral resources and Measured Mineral resources that, in the opinion of the Qualified person, can be the basis of an Economically viable project. More specifically, it is the economically mineable part of a measured or Indicated Mineral resource, which includes diluting materials and allowances for losses that may occur when the material is mined or extracted.

26.22 Mineral resource

Is a concentration or occurrence of 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 economic extraction. A Mineral resource is a reasonable estimate of mineralisation, taking into account relevant factors such as Cutoff grade, likely mining dimensions, location or continuity, that, with the assumed and justifiable technical and economic conditions, is likely to, in whole or in part, become economically extractable. It is not merely an inventory of all mineralisation drilled or sampled.

26.23 Modifying factors

Are the factors that a Qualified person must apply to Indicated Mineral resources and Measured Mineral resources and then evaluate in order to establish the economic viability of Mineral reserves. A Qualified person must apply and evaluate modifying factors to convert Measured Mineral resources and Indicated Mineral resources to Proven Mineral reserves and Probable Mineral reserves. These factors include, but are not restricted to: Mining; processing; metallurgical; infrastructure; economic; marketing; legal; environmental compliance; plans, negotiations, or agreements with local individuals or groups; and governmental factors. The number, type and specific characteristics

of the modifying factors applied will necessarily be a function of and depend upon the mineral, mine, property, or project.

26.24 Preliminary feasibility study (or pre-feasibility study)

Is 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 Qualified person has determined (in the case of underground mining) a preferred mining method, or (in the case of surface mining) a pit configuration, and in all cases has determined an effective method of mineral processing and an effective plan to sell the product.

1. A pre-feasibility study includes a financial analysis based on reasonable assumptions, based on appropriate testing, about the Modifying factors and the evaluation of any other relevant factors that are sufficient for a Qualified person to determine if all or part of the Indicated Mineral resources and Measured Mineral resources may be converted to Mineral reserves at the time of reporting. The financial analysis must have the level of detail necessary to demonstrate, at the time of reporting, that extraction is Economically viable.
2. A pre-feasibility study is less comprehensive and results in a lower confidence level than a Feasibility study. A pre-feasibility study is more comprehensive and results in a higher confidence level than an Initial assessment.

26.25 Preliminary market study

Is a study that is sufficiently rigorous and comprehensive to determine and support the existence of a readily accessible market for the mineral. It must, at a minimum, include product specifications based on preliminary geologic and metallurgical testing, supply and demand forecasts, historical prices for the preceding five or more years, estimated long term prices, evaluation of competitors (including products and estimates of production volumes, sales, and prices), customer evaluation of product specifications, and market entry strategies. The study must provide justification for all assumptions. It can, however, be less rigorous and comprehensive than a Final market study, which is required for a full Feasibility study.

26.26 Probable Mineral reserve

Is the economically mineable part of an Indicated Mineral resource and, in some cases, a Measured Mineral resource.

26.27 Production stage issuer

Is an issuer that is engaged in material extraction of Mineral reserves on at least one Material property.

26.28 Production stage property

Is a property with material extraction of Mineral reserves.

26.29 Proven Mineral reserve

Is the economically mineable part of a Measured Mineral resource and can only result from conversion of a Measured Mineral resource.

26.30 Qualified person

Is an individual who is:

1. A mineral industry professional with at least five years of Relevant experience in the type of mineralisation and type of deposit under consideration and in the specific type of activity that person is undertaking on behalf of the Registrant; and
2. An eligible member or licensee in good standing of a recognised professional organisation at the time the technical report is prepared. For an organisation to be a recognised professional organisation, it must:
    - i Be either:
        - A. An organisation recognised within the mining industry as a reputable professional association; or

B. A board authorised by U.S. federal, state or foreign statute to regulate professionals in the mining, geoscience or related field;

ii Admit eligible members primarily on the basis of their academic qualifications and experience;

iii Establish and require compliance with professional standards of competence and ethics;

iv Require or encourage continuing professional development;

v Have and apply disciplinary powers, including the power to suspend or expel a member regardless of where the member practices or resides; and

vi Provide a public list of members in good standing.

26.31 Relevant experience

Means, for purposes of determining whether a party is a Qualified person, that the party has experience in the specific type of activity that the person is undertaking on behalf of the Registrant. If the Qualified person is preparing or supervising the preparation of a technical report concerning Exploration results, the relevant experience must be in exploration. If the Qualified person is estimating, or supervising the estimation of Mineral resources, the relevant experience must be in the estimation, assessment and evaluation of Mineral resources and associated technical and economic factors likely to influence the prospect of economic extraction. If the Qualified person is estimating, or supervising the estimation of Mineral reserves, the relevant experience must be in engineering and other disciplines required for the estimation, assessment, evaluation and economic extraction of Mineral reserves.

1. Relevant experience also means, for purposes of determining whether a party is a Qualified person, that the party has experience evaluating the specific type of mineral deposit under consideration (e.g., coal, metal, base metal, industrial mineral, or mineral brine). The type of experience necessary to qualify as relevant is a facts and circumstances determination. For example, experience in a high-nugget, vein-type mineralisation such as tin or tungsten would likely be relevant experience for estimating Mineral resources for vein-gold mineralisation, whereas experience in a low grade disseminated gold deposit likely would not be relevant.

   Note 1 to paragraph (1) of the definition of relevant experience: It is not always necessary for a person to have five years' experience in each and every type of deposit in order to be an eligible Qualified person if that person has relevant experience in similar deposit types. For example, a person with 20 years' experience in estimating Mineral resources for a variety of metalliferous hard-rock deposit types may not require as much as five years of specific experience in porphyry-copper deposits to act as a Qualified person. Relevant experience in the other deposit types could count towards the experience in relation to porphyry-copper deposits.

2. For a **Qualified person** providing a technical report for **Exploration results** or **Mineral resource** estimates, relevant experience also requires, in addition to experience in the type of mineralisation, sufficient experience with the sampling and analytical techniques, as well as extraction and processing techniques, relevant to the mineral deposit under consideration. Sufficient experience means that level of experience necessary to be able to identify, with substantial confidence, problems that could affect the reliability of data and issues associated with processing.

3. For a **Qualified person** applying the **Modifying factors**, as defined by this section, to convert **Mineral resources** to **Mineral reserves**, relevant experience also requires:

   i Sufficient knowledge and experience in the application of these factors to the mineral deposit under consideration; and

   ii Experience with the geology, geostatistics, mining, extraction and processing that is applicable to the type of mineral and mining under consideration.

Date and Signature Page

Qualified Person	Signature	Date
Dr Julian Verbeek	/s/ Dr. Julian Verbeek	27 March 2022
Richard Butcher	/s/ Richard Butcher	28 March 2022
Dr Winfred Assibey-Bonsu	/s/ Dr Winfred Assibey-Bonsu	27 March 2022
Andrew Engelbrecht	/s/ Andrew Engelbrecht	28 March 2022
Peter Andrews	/s/ Peter Andrews	27 March 2022
Daniel Hillier	/s/ Daniel Hillier	28 March 2022
Johan Boshoff	/s/ Johan Boshoff	28 March 2022
Andre Badenhorst	/s/ Andre Badenhorst	27 March 2022
Fiona Phillips	/s/ Fiona Phillips	29 March 2022
Trent Strickland	/s/ Trent Strickland	29 March 2022
Peter Burge	/s/ Peter Burge	29 March 2022
Neil Morris	/s/ Neil Morris	29 March 2022
Stephanie Gotley	/s/ Stephanie Gotley	29 March 2022