GLENCORE

Resources & Reserves

as at 31 December 2018

Contents

About this report

We report our resources and reserves in accordance with the 2012 edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code), the 2016 edition of the South African Code for Reporting of Mineral Resources and Mineral Reserves (SAMREC), the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Standards on Mineral Resources and Reserves (2014 edition) and the Petroleum Resources Management System (PRMS) for reporting oil and natural gas Reserves and Resources.

Overview

The resource and reserve data in the following tables are as at 31 December 2018, unless otherwise noted. For comparison purposes, data for 2017 has been included.

Metric units are used throughout.

All data is presented on a 100% asset basis, with the Glencore attributable percentage shown against each asset, with the exception of Oil assets which are shown on a working interest basis.

All tonnage information has been rounded to reflect the relative uncertainty in the estimates; there may therefore be small differences in the totals.

The Measured and Indicated resources are reported inclusive of those resources modified to produce reserves, unless otherwise noted.

Commodity prices and exchange rates used to establish the economic viability of reserves are based on long-term forecasts applied at the time the reserve was estimated.

Where resources and reserves have not been updated, on the basis that the information has not materially changed since it was reported under JORC 2004, this information has not been updated to comply with the JORC code 2012. Reference is given in the report where this is the case.

Copper

The Copper Mineral Resources and Ore Reserves Statement at 31 December 2018 has been compiled in accordance with the JORC Code.

The Mineral Resources and Ore Reserves statements have been reviewed and the relevant data extracted and compiled by Mark Jamieson, Glencore Copper.

Zinc

The Zinc Mineral Resource and Ore Reserve Statement at 31 December 2018 has been compiled in accordance with the JORC Code.

The term ‘Ore Reserves’, as defined in Clause 28 of the JORC Code, has the same meaning as ‘Mineral Reserves’ as defined in the CIM Definition Standards for Mineral Resources and Mineral Reserves.

The Mineral Resource and Ore Reserve statements have been reviewed and the relevant data extracted and compiled by Aline Cote, Glencore Zinc (OGQ).

Nickel

The Canadian and New Caledonian Mineral Resources and Mineral Reserves estimates are prepared in accordance with the CIM Definition Standards on Mineral Resources and Mineral Reserves, adopted by CIM Council on 10 May 2014, and the CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines, adopted by CIM Council on 23 November 2003, and have been compiled using geo-statistical and/or classical methods, plus economic and mining parameters appropriate to each project.

The Mineral Resource and Ore Reserve estimates at Murrin in Australia have been prepared in accordance with the JORC Code.

The Mineral Resource and Ore Reserve statements have been reviewed and the relevant data extracted and compiled by Steve Kormos, Glencore Nickel.

Ferroalloys

South African chromite, vanadium and PGM’s (platinum group metals) Mineral Resources and Ore Reserves in this report were prepared in accordance with the JORC Code.

The Chromite, Vanadium and PGM’s Mineral Resource and Ore Reserve Statement at 31 December 2018 is based on the Glencore Ferroalloys “Procedure for the Estimation of Mineral Resources and Ore Reserves”. Definitions of all the terms used in this report can be found in the relevant code.
The Mineral Resource and Ore Reserve statements have been reviewed and the relevant data extracted and compiled by Pieter-Jan Gräbe, Glencore Ferroalloys (SACNASP).

Iron Ore

Iron ore Mineral Resources and Ore Reserves have been compiled in accordance with the JORC Code, unless otherwise stated in the notes for a particular Mineral Resource and Ore Reserve.

Iron Ore Mineral Resources and Ore Reserves have not been re-estimated since 2015.

Coal

Australian, Canadian and Colombian Coal Resources and Reserves have been prepared in accordance with the JORC Code.

South African Coal Resources and Reserves have been prepared in accordance with the 2016 edition of the South

About this report

African Code for Reporting of Mineral Resources and Mineral Reserves (SAMREC).

The Coal Resource and Reserve Statements as at 31 December 2018 conform to the requirements of these Codes and are consistent with Glencore Coal's internal Coal Resource and Reserve Estimation and Reporting Standard.

Coal resources have been estimated for all coal seams that have reasonable prospects for eventual economic extraction by open cut or underground mining methods within mining leases or exploration licences. In general, Coal Resources are reported within a geoshell limited by the areal and depth extent of the drill holes; i.e. there is very little inclusion of Coal Resources extrapolated beyond the extent of the geological data.

Coal Resources are excluded from those areas where the seam has been extracted or sterilised by mining.

All tonnage information has been rounded to reflect the relative uncertainty in the estimates; there may therefore be small differences in the totals.

Coal Resource and Reserve totals are rounded to appropriate levels of accuracy in accordance with the Glencore Coal rounding procedures. The following table summarises the data rounding assumptions for the 2018 report.

Classification	Tonnage Range	Rounding
Measured + Indicated Resources / Proved + Probable Reserves	< 10Mt	1 significant figure
	10Mt - 30Mt	2 significant figures
	30Mt - 100Mt	Nearest 5Mt
	> 100Mt	2 significant figures
	>1000Mt	Nearest 50Mt
Inferred	< 100Mt	Nearest 10Mt
	100Mt - 400Mt	Nearest 50Mt
	> 400Mt	Nearest 100Mt

Coal Reserves are rounded to the same assumptions as Measured and Indicated Coal Resources above. Individual tonnage assessments are added to show Group or Complex tonnages and geographical accumulations. These are not subjected to further rounding.

The Coal Resource and Reserve Competent Person statements have been reviewed and the relevant data extracted and compiled by Xavier Wagner, under the supervision of Jeff Gerard, both Glencore Coal.

Oil

Oil and natural gas Resources and Reserves have been prepared in accordance with the PRMS jointly published by the Society of Petroleum Engineers, the World Petroleum Council, the American Association of Petroleum Geologists and the Society of Petroleum Evaluation Engineers, as amended.

The Oil Reserves statement has been reviewed and the relevant data extracted and compiled by McDaniel & Associates.

The Oil Resources statements for Equatorial Guinea, Chad and Cameroon have been reviewed and the relevant data extracted and compiled by Glencore.

Competent/Qualified Persons

Resource and reserve estimates are based on information compiled by Competent Persons (as defined by the JORC, SAMREC Codes), Qualified Persons (as defined by CIM Definition Standards for Mineral Resources and Mineral Reserves) and Adequately Qualified Persons (as defined by PRMS).

Each of the Competent/Qualified Persons has the appropriate professional membership and the relevant experience in relation to the resources and/or reserves being reported by them to qualify as a Competent or Qualified Person as defined in the relevant code or standard. Each has consented to the inclusion of their resource and reserve estimates in the form and context in which it appears in this report.

Definitions

Throughout this report, the following abbreviations and definitions have been used:

Technical and industry terms:

3PGE	Three Platinum Group Elements (Platinum, Palladium and Rhodium)	NSR	Net Smelter Return
CV (kcal/kg)	Calorific Value, kilo calories per kilogramme	OC	Open cast or Open cut
DTC	Davis Tube Concentrate	OR	Ore Reserves
EL	Exploration Licence	QQ	Quantile quantile plot, a geostatistical method to assess modelled data against actual data
Geoshell	A broad envelope limited by the depth and areal extent of geological data points (primarily drill holes)	ROM	Run of Mine
kt	Thousand tonnes	SX/EW	Solvent extraction and electrowinning
LOM	Life of Mine	UG	Underground
LOX	Limit of Oxidation	UG2	Upper Group No2 Chromitite layer
LOZ	Lower Oxidised Zone	VMS	Volcanogenic Massive Sulphide
Mt	Million tonnes		

Professional bodies and applicable standards:

AIG	Australian Institute of Geoscientists
APEGBC	Association of Professional Engineers and Geoscientists of BC
APEGGA	Association of Professional Engineers Geologists and Geophysicists of Alberta
APEGNB	Association of Professional Engineers and Geoscientists of New Brunswick
APGO	Association of Professional Geoscientists of Ontario
AusIMM	Australasian Institute of Mining and Metallurgy
CIM	Canadian Institute of Mining, Metallurgy and Petroleum
ECSA	Engineering Council of South Africa
GSL	Geological Society of London
ICOG-EurGeol	Ilustre Colegio Oficial de Geólogos – European Geologist
JORC	Joint Ore Reserves Committee
OGQ	Ordre des Géologues du Québec
OIQ	Ordre des Ingénieurs du Québec
PEO	Professional Engineers of Ontario
PLATO	South African Council for Professional and Technical Surveyors
PRMS	Petroleum Resources Management System
QQ	Quantile quantile plot, a geostatistical method to assess modelled data against actual data
SACNASP	The South African Council for Natural Scientific Professions
SAMREC	South African Code for Reporting of Mineral Resources and Mineral Reserves

Marketable Coal Reserves (CIM/JORC) and Saleable Coal Reserves (SAMREC) are the tonnage and coal quality that will be available for sale, either in the raw ROM state at specific moisture content or after beneficiation of the ROM Coal Reserve has produced materials at specified qualities, moisture contents and size ranges.

Definitions of many of the terms used in this report can be found in the relevant codes.

Metals and Minerals
Copper

African Copper Mineral Resources (Katanga, Mutanda, Mopani)

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources 31.12.18	Measured Mineral Resources 31.12.17	Indicated Mineral Resources 31.12.18	Indicated Mineral Resources 31.12.17	Measured and Indicated Resources 31.12.18	Measured and Indicated Resources 31.12.17	Inferred Mineral Resources 31.12.18	Inferred Mineral Resources 31.12.17	Competent person
Katanga												
Kamoto	64.7%	UG	(Mt)	12.1	12.2	65.6	65.9	77.7	78.1	48.4	48.5	CS
			Copper (%)	3.90	3.90	3.92	3.92	3.92	3.92	3.83	3.83	
			Cobalt (%)	0.59	0.59	0.46	0.46	0.48	0.48	0.38	0.38	
T17 (OC&UG)	64.7%		(Mt)	4.2	4.2	9.4	9.4	13.6	13.6	5.2	5.2	CS
		UG/OC	Copper (%)	2.66	2.66	4.44	4.44	3.89	3.89	4.21	4.21	
			Cobalt (%)	0.51	0.51	0.65	0.65	0.61	0.61	0.98	0.98	
Mashamba	64.7%	OC	(Mt)	–	–	57.8	60.0	57.8	60.0	15.9	18.3	CS
East			Copper (%)	–	–	1.72	1.68	1.72	1.68	2.72	2.85	
			Cobalt (%)	–	–	0.63	0.62	0.63	0.62	0.51	0.47	
KOV OC,	64.7%	OC	(Mt)	–	–	106.8	110.4	106.8	110.4	77.6	78.0	CS
KOV UG,			Copper (%)	–	–	4.80	4.75	4.80	4.75	4.40	4.40	
KTE			Cobalt (%)	–	–	0.53	0.53	0.53	0.53	0.38	0.38	
Kananga	64.7%	OC	(Mt)	–	–	4.1	4.1	4.1	4.1	4.0	4.0	CS
			Copper (%)	–	–	1.61	1.61	1.61	1.61	2.00	2.00	
			Cobalt (%)	–	–	0.79	0.79	0.79	0.79	0.98	0.98	
Tilwezembe	64.7%	OC	(Mt)	–	–	9.5	9.5	9.5	9.5	13.8	13.8	CS
			Copper (%)	–	–	1.89	1.89	1.89	1.89	1.75	1.75	
			Cobalt (%)	–	–	0.60	0.60	0.60	0.60	0.60	0.60	
KITD	64.7%		(Mt)	–	–	6.1	7.8	6.1	7.8		–	CS
			Copper (%)	–	–	1.44	1.49	1.44	1.49		–	
			Cobalt (%)	–	–	0.17	0.16	0.17	0.16	48.4	–	
Total Katanga			**(Mt)**	**16**	**16**	**259**	**267**	**276**	**284**	**165**	**168**	
			Copper (%)	**3.58**	**3.58**	**3.64**	**3.60**	**3.64**	**3.60**	**3.78**	**3.79**	
			Cobalt (%)	**0.57**	**0.57**	**0.54**	**0.53**	**0.54**	**0.54**	**0.44**	**0.44**	
Mutanda												
Mutanda	100%	OC	(Mt)	356.0	208.0	234.1	171.0	590.1	379.0	60.2	143.0	CS
South			Copper (%)	1.44	1.49	0.83	1.21	1.20	1.36	0.81	0.81	
			Cobalt (%)	0.49	0.54	0.26	0.46	0.40	0.51	0.22	0.41	
Mutanda	100%	OC	Mt	48.1	48.1	29.1	29.1	77.2	77.2	58.9	58.9	CS
North			Copper (%)	0.73	0.73	0.51	0.51	0.65	0.65	0.48	0.48	
			Cobalt (%)	0.34	0.34	0.14	0.14	0.26	0.26	0.08	0.08	
Total Mutanda			**(Mt)**	**404**	**256**	**263**	**200**	**667**	**456**	**119**	**202**	
			Copper (%)	**1.36**	**1.36**	**0.79**	**1.11**	**1.14**	**1.24**	**0.65**	**0.71**	
			Cobalt (%)	**0.47**	**0.51**	**0.25**	**0.41**	**0.38**	**0.46**	**0.15**	**0.31**	
Mopani												
Nkana	73.1%	UG	(Mt)	157.2	159.1	49.0	47.1	206.2	206.1	48.8	50.8	CS
Sulphides			Copper (%)	2.06	2.07	2.00	2.04	2.05	2.06	1.97	1.98	
			Cobalt (%)	0.10	0.11	0.11	0.12	0.10	0.11	0.12	0.13	
Nkana	73.1%	UG/OC	(Mt)	7.2	7.2	1.9	1.9	9.2	9.2	1.5	1.5	CS
Oxides			Copper (%)	2.25	2.25	1.92	1.92	2.18	2.18	1.89	1.89	
			Cobalt (%)	0.03	0.03	0.06	0.06	0.04	0.04	0.04	0.04	
Nkana	73.1%		(Mt)	–	–	5.7	5.7	5.7	5.7	0.8	0.8	CS
Tailings			Copper (%)	–	–	0.71	0.71	0.71	0.71	0.94	0.94	
Dump			Cobalt (%)	–	–	0.07	0.07	0.07	0.07	0.07	0.07	
Mufulira	73.1%	UG	(Mt)	32.1	32.9	15.9	15.9	48.0	48.8	21.9	21.9	CS
Sulphides			Copper (%)	2.44	2.44	2.57	2.57	2.48	2.49	2.42	2.42	
Mufulira	73.1%	UG	(Mt)	8.8	8.8	2.0	2.0	10.7	10.8	1.3	1.3	CS
Oxides			Copper (%)	1.19	1.19	0.9	0.90	1.14	1.14	0.81	0.81	
Mufulira	73.1%		(Mt)	3.0	3.0	1.8	1.8	4.9	4.8	1.3	1.3	CS
Surface			Copper (%)	1.81	1.81	1.8	1.80	1.81	1.81	1.76	1.76	
Total Mopani			**(Mt)**	**208**	**211**	**76**	**74**	**285**	**285**	**76**	**78**	
			Copper (%)	**2.08**	**2.09**	**1.99**	**2.01**	**2.06**	**2.07**	**2.06**	**2.07**	
			Cobalt (%)	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.08**	**0.09**	

Metals and Minerals Copper

African Copper Ore Reserves (Katanga, Mutanda, Mopani)

Name of operation	Attributable interest	Mining method	Commodity	Proved Ore Reserves 31.12.18	Proved Ore Reserves 31.12.17	Probable Ore Reserves 31.12.18	Probable Ore Reserves 31.12.17	Total Ore Reserves 31.12.18	Total Ore Reserves 31.12.17	Competent person
Katanga										
Kamoto	64.7%	UG	Ore (Mt)	6.5	6.6	20.1	20.3	26.6	26.9	JL
			Copper (%)	3.60	3.59	3.34	3.34	3.40	3.40	
			Cobalt (%)	0.56	0.56	0.53	0.54	0.54	0.54	
T17 (OC & UG)	64.7%	UG/OC	Ore (Mt)	2.2	2.2	9.1	9.1	11.3	11.3	JL
			Copper (%)	3.42	3.42	3.71	3.71	3.65	3.65	
			Cobalt (%)	0.54	0.54	0.64	0.64	0.62	0.62	
Mashamba East	64.7%	OC	Ore (Mt)	–	–	31.6	32.1	31.6	32.1	JL
			Copper (%)	–	–	2.15	2.13	2.15	2.13	
			Cobalt (%)	–	–	0.60	0.60	0.60	0.60	
KOV OC,	64.7%	OC	Ore (Mt)	–	–	57.5	60.5	57.5	60.5	JL
KOV UG, KTE			Copper (%)	–	–	3.72	3.70	3.72	3.70	
			Cobalt (%)	–	–	0.48	0.48	0.48	0.48	
KITD	64.7%		Ore (Mt)	–	–	5.7	7.4	5.7	7.4	JL
			Copper (%)	–	–	1.44	1.49	1.44	1.49	
			Cobalt (%)	–	–	0.17	0.16	0.17	0.16	
Total Katanga			**(Mt)**	**9**	**9**	**124**	**129**	**133**	**138**	
			Copper (%)	**3.56**	**3.55**	**3.15**	**3.13**	**3.18**	**3.15**	
			Cobalt (%)	**0.55**	**0.55**	**0.51**	**0.51**	**0.52**	**0.51**	
Mutanda										
Mutanda South	100%	OC	Ore (Mt)	29.6	24.6	2.2	1.9	31.8	26.5	JL
Oxide Ore			Copper (%)	1.87	2.46	1.03	1.51	1.81	2.39	
			Cobalt (%)	0.85	0.97	0.68	0.71	0.84	0.95	
Transitional Ore	100%	OC	Ore (Mt)	17.5	22.8	1.1	11.6	18.6	34.4	JL
			Copper (%)	2.19	1.86	1.49	1.51	2.15	1.74	
			Cobalt (%)	0.79	0.69	0.80	0.66	0.79	0.68	
Sulphide Ore	100%	OC	Ore (Mt)	–	15.0	48.7	20.1	48.7	35.1	JL
			Copper (%)	–	1.66	1.83	1.87	1.83	1.78	
			Cobalt (%)	–	0.57	0.58	0.54	0.58	0.55	
Stockpiles	100%		Ore (Mt)	32.8	30.2	–	–	32.8	30.2	JL
			Copper (%)	1.26	1.27	–	–	1.26	1.27	
			Cobalt (%)	0.52	0.51	–	–	0.52	0.51	
Total Mutanda			**(Mt)**	**80**	**93**	**52**	**34**	**132**	**126**	
			Copper (%)	**1.69**	**1.80**	**1.79**	**1.73**	**1.73**	**1.78**	
			Cobalt (%)	**0.70**	**0.69**	**0.59**	**0.59**	**0.66**	**0.66**	
Mopani										
Nkana Sulphides	73.1%	UG	Ore (Mt)	94.5	97.0	25.4	22.89	119.9	119.9	JL
			Copper (%)	1.84	1.85	1.79	1.86	1.83	1.86	
Mufulira Sulphides	73.1%	UG	Ore (Mt)	16.7	17.3	7.3	7.2	24.0	24.5	JL
			Copper (%)	2.21	2.20	2.30	2.30	2.24	2.23	
Total Mopani			**(Mt)**	**111**	**114**	**33**	**30**	**144**	**144**	
			Copper (%)	**1.90**	**1.91**	**1.90**	**1.97**	**1.90**	**1.92**	

Notes

Katanga: Remaining life of mine: expected to be in excess of 20 years. Expiry date of relevant permits: 7 May 2022 for the Kananga Extension and 3 April 2024 for all remaining permits (Kamoto and Mashamba East Open Pit, T-17 Open Pit, KOV Open Pit, Tilwezembe Open Pit, Kananga Mine), renewable in accordance with the DRC mining code for a period of 15 years.

Glencore owns 86.3% of Katanga Mining Limited ("KML"), which in turn owns 75% of Kamoto Copper Company SA (“KCC”). KCC owns the material assets, including the mining and exploration rights related to the mining assets. La Generale des Carrieres et des Mines ("GCM") and La Société Immobilière du Congo, which are state-owned mining companies in the DRC, own the other 25% of KCC.

With the exception of Tilwezembe, the primary sulphide mineralisation within the Lower Roan, Orebody Inferior, is associated with Stratified Dolomite and Silicified Rock. The primary sulphides in the Orebody Superior is associated with the Basal Schists and Upper Dolomitic Shales for and is thought to be sys-sedimentary in origin. Typical primary copper sulphide minerals are bornite, chalcopyrite, chalcocite and occasional native copper while cobalt is in the form of carrolite. The mineralisation occurs as disseminations or in association with hydrothermal carbonate alteration and silicification.

The mineralisation at Tilwezembe Mine is atypical being hosted by the Mwashya or R4 Formation. The mineralisation generally occurs as infilling of fissures and open fractures associated with the brecciation. The typical copper minerals are mainly chalcopyrite, malachite and pseudomalachite while cobalt is in the form of heterogenite, carrolite and spherocobaltite. Manganese minerals are psilomelane and manganite.

Mineral Resources and Ore Reserves decreased from 2017 to 2018 due to mining depletion.

Mutanda: Remaining mine life: estimated in excess of 15 years. (assuming approval and investment in sulphide ore processing, described below). Expiry date of relevant mining permits: 26 May 2022 for Mutanda South ("Mutanda") and 5 May 2022 for Mutanda North ("Kansuki"). Both mining permits are renewable in accordance with the DRC mining code for periods of 15 years.

Kansuki consists of Kabwimia, Area 2 East, and Area 2 West. Mutanda consists of East (includes Area 1), Central (includes Central North West), and West.

Overall Mineral Resources increased by 128 Mt from 2017 to 2018, attributed to the 2018 drilling campaign, mainly at Mutanda East areas (38 holes), with minor contributions from density revisions and 3D modelling changes in the resource estimates. Such increase and promotion of resources from Inferred to Measured and Indicated was partially offset by mining depletion. Kansuki was not operating in 2018 and the assessment of its resources remains unchanged.

The Ore Reserve estimate for Mutanda increased by 6Mt from 2017 to 2018 mainly as a result of the updated resource model and engineering changes, partially offset by mining depletion, modelling changes with regards to acid soluble grades and economic inputs (including revisions from the new 2018 Mining Code).

The 2018 resource drilling and update of the model resulted in a material change in the distribution of oxide, transitional and sulphide ore types, with decreased volume of oxide and transitional ore and an increase in sulphide ore. An underlying decrease of oxide and transitional ore reserves was partially offset by the reintroduction of oxide reserves constrained by the location of the tailings storage facility (now being successfully hydro-mined).

Mutanda currently only has processing capabilities for oxide and transitional ore. The inclusion of sulphide ore reserves is supported by a feasibility study completed in 2013 which considered producing a copper concentrate from sulphide ore with the addition of a new concentrator. The Mutanda sulphide ore reserve has been reclassified as probable due to the current uncertain political and increased cost environment.

A further feasibility study regarding processing the larger sulphide reserve to produce copper cathode and cobalt hydroxide is in progress, with planned completion in 2019.

An investment decision on sulphide ore mining and processing will be considered upon completion of the updated feasibility study.

Mopani: Remaining life of mine: 27 years for Nkana and 16 years for Mufulira, extended from the 13 years reported in 2017 due to assumed change in steady-state production from 2.4Mtpa to 1.5Mtpa. Expiry date of relevant mining/ concession licences: 31 March 2025 for both of these mines. Licences are renewable in accordance with the provisions of the relevant laws of Zambia.

Within the Nkana mining area there are four underground mines and a series of open pits. Apart from the “Area Nose” open pit, which is scheduled for production in 2019, the open pits are either exhausted or under care and maintenance and have therefore been excluded from Ore Reserves and included under Mineral Resources. All the mines are situated on the north-eastern limb of the Nkana Syncline area. The orebodies are stratiform and are mainly confined to a recognisable ore formation, which occurs near the base of the Katangan sequence within the Lower Roan Group of the Mine Series. In the underground workings, the principal copper ore minerals are chalcopyrite and bornite with subordinate chalcocite. There is a zoning in the geographical distribution of these minerals. Cobalt occurs as carrollite and cobaltiferious pyrite. In the open pits, malachite and chrysocolla are the principal ore minerals in the zone of oxidation closer to the surface. In some places however, vermiculite, malachite pseudomalachite and accessory wad are present. At deeper levels chalcopyrite, bornite and chalcocite are predominantly present.

In the Mufulira mining area, the Basement Complex topography appears to have exerted a significant structural control during deformation. The distribution of ore minerals in all three orebodies is stratigraphically controlled, occurring dominantly as disseminations, blebs and irregular masses. The principal copper minerals are chalcopyrite, bornite, and minor/trace chalcocite. Oxide minerals are confined to near surface occurrences, and supergene enrichment zones. Generally the deposit is structurally simple being characterised by three main folds that are in part overturned with a plunge and dip approximately 10º to the northeast. The basin is open and untested at depth.

The change in the Mineral Resources at Mufulira from 2017 to 2018 is mostly due to mining depletion, while changes at Nkana are due to re-interpreted geological models for Nkana North (Mindola Sub Vertical (MSV) and North Shaft) supported by new drilling information and updated mining depletion. The ore boundary at MSV has been shifted on the footwall side from Assay Footwall (AFW) to Geological Footwall (GFW) to capture low grade material between GFW

and AFW which is also mined during stoping. MSV stopes are designed from GFW to Assay Hangingwall (AHW).

Changes in Ore Reserves from 2017 to 2018 at Mufulira relate only to mining depletion, whilst changes at Nkana are due to mining depletion and updated Mineral Resource Models at Nkana North (MSV and North Shaft). Cobalt is no longer reported within the Nkana Ore Reserves as the Nkana cobalt beneficiation plant has been decommissioned and cobalt is not produced as a saleable product.

Competent Persons

CS = Christiano Santos Goncalves of Golder Associates Africa (Pty) Ltd, (MAusIMM CP (Geo)).

HT = Hugo Tukker of Golder Associates Africa (Pty) Ltd, (ECSA, PrEng).

JL = Jacobus Lotheringen of Ukwazi Mining Solutions (Pty) Ltd, for Golder Associates Africa (Pty) Ltd, (SAIMM, PrEng.).

Metals and Minerals Copper

Collahuasi Mineral Resources

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources 31.12.18	Measured Mineral Resources 31.12.17	Indicated Mineral Resources 31.12.18	Indicated Mineral Resources 31.12.17	Measured and Indicated Resources 31.12.18	Measured and Indicated Resources 31.12.17	Inferred Mineral Resources 31.12.18	Inferred Mineral Resources 31.12.17	Competent person
Collahuasi	44%	OC	Sulphide (Mt)	834	898	4,427	4,442	5,261	5,340	5,007	4,393	YT
			Copper (%)	0.85	0.86	0.81	0.81	0.82	0.82	0.74	0.76	
			Molybdenum (%)	0.019	0.018	0.025	0.023	0.024	0.022	0.015	0.013	
			Oxide & Mixed (Mt)	37	36	31	29	67	65	45	51	YT
			Copper (%)	0.67	0.67	0.73	0.73	0.70	0.69	0.56	0.57	
Total Collahuasi			**(Mt)**	**870**	**934**	**4,458**	**4,471**	**5,328**	**5,405**	**5,052**	**4,444**	
			Copper (%)	**0.84**	**0.85**	**0.81**	**0.81**	**0.82**	**0.82**	**0.74**	**0.75**	
			Molybdenum (%)	**0.02**	**0.02**	**0.03**	**0.02**	**0.02**	**0.02**	**0.02**	**0.01**	

Collahuasi Ore Reserves

Name of operation	Attributable interest	Mining method	Commodity	Proved Ore Reserves 31.12.18	Proved Ore Reserves 31.12.17	Probable Ore Reserves 31.12.18	Probable Ore Reserves 31.12.17	Total Ore Reserves 31.12.18	Total Ore Reserves 31.12.17	Competent person
Collahuasi	44%	OC	Sulphide (Mt)	448	479	2,683	2,740	3,131	3,220	AP
			Copper (%)	1.10	1.14	0.90	0.89	0.93	0.93	
			Molybdenum (%)	0.023	0.023	0.026	0.024	0.026	0.024	

Notes

Collahuasi: The Collahuasi district is located in Northern Chile, Tarapacá Region, and hosts large Copper-Molybdenum porphyry-type deposits: Ujina, Rosario a high sulphidation vein deposit as Rosario Oeste and a oxide copper deposit as Rosario Sur. Sulphides as chalcopyrite, bornite and less chalcosite are the main copper minerals at Ujina and Rosario. At Rosario Oeste, supergene chalcosite is the main copper mineral. Rosario Sur is a small oxide-bearing deposit, mainly of chrysocolla. Collahuasi is mined by open cut methods. The Rosario orebody is the main source of mineral for current Collahuasi operation. Mineral Resources for Rosario, Ujina, Rosario Oeste and Rosario Sur have been classified into Measured, Indicated and Inferred categories based on minimum search radius constraints, drillhole spacing and equivalent grid spacing. Mineral Resources are reported within the constraints of optimized pit shells. Mineral Resources and Ore Reserves have been updated on the basis of new drilling information, updated geological-geostatistical models, mining parameters and adjustments to metal prices forecast. The 49 Mt ore production for 2018 (basis actual production to October and an estimate for November/December) is already depleted from the reported Ore Reserves. Ore Reserves estimates are based only on Measured and Indicated Mineral Resources. The Ore Reserves include all Proved and Probable Reserves above the mill (operational) cut-off grade. The process of generating the resource model and optimized pit shells already incorporates diluting materials. Thus no additional dilution factors were required in converting Mineral Resources to Ore Reserves. Both Mineral Resources and Ore Reserves includes estimates of stockpile material at time of reporting. Material included in stockpile is periodically verified and re-evaluated through drilling, trenching, and sampling. Stockpile material from Rosario and Ujina pits are classified according to the level of perceived uncertainty. All sulphide stockpiles are considered Indicated Mineral Resources and are classified as Probable Ore Reserves.

Collahuasi has a life of mine of 63 years from 2019 to 2081, according to the most recent life of mine plan that supports the present reserves report.

Competent Persons

YT = Yuan Tay, Employee of Compañía Minera Doña Inés de Collahuasi (APEGBC).

AP = Andrés Pérez, Employee of Compañía Minera Doña Inés de Collahuasi (APEGBC).

Metals and Minerals Copper

Antamina Mineral Resources

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources 31.12.18	Measured Mineral Resources 31.12.17	Indicated Mineral Resources 31.12.18	Indicated Mineral Resources 31.12.17	Measured and Indicated Resources 31.12.18	Measured and Indicated Resources 31.12.17	Inferred Mineral Resources 31.12.18	Inferred Mineral Resources 31.12.17	Competent person
Antamina	33.75%	OC/UG	Sulphide Cu (Mt)	242	170	441	528	683	698	824	1,104	LC
			Copper (%)	0.86	0.88	0.84	0.87	0.85	0.88	0.95	0.90	
			Zinc (%)	0.14	0.14	0.14	0.16	0.14	0.16	0.17	0.29	
			Silver (g/t)	7	7	9	9	8	8	10	9	
			Molybdenum (%)	0.031	0.031	0.026	0.027	0.028	0.028	0.025	0.023	
			Sulphide Cu-Zn (Mt)	105	84	266	289	371	373	412	268	LC
			Copper (%)	0.88	0.90	0.91	0.93	0.90	0.93	1.09	0.94	
			Zinc (%)	1.83	2.01	1.80	1.86	1.81	1.90	1.48	1.61	
			Silver (g/t)	17	18	16	16	16	16	16	15	
			Molybdenum (%)	0.009	0.009	0.008	0.008	0.008	0.008	0.008	0.009	
Total Antamina			**(Mt)**	**347**	**254**	**707**	**816**	**1,054**	**1,070**	**1,236**	**1,372**	
			Copper (%)	**0.87**	**0.89**	**0.86**	**0.89**	**0.87**	**0.89**	**0.99**	**0.91**	
			Zinc (%)	**0.65**	**0.76**	**0.77**	**0.76**	**0.73**	**0.76**	**0.60**	**0.55**	
			Silver (g/t)	**10**	**11**	**11**	**11**	**11**	**11**	**12**	**10**	
			Molybdenum (%)	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	

Antamina Ore Reserves

Name of operation	Attributable interest	Mining method	Commodity	Proved Ore Reserves 31.12.18	Proved Ore Reserves 31.12.17	Probable Ore Reserves 31.12.18	Probable Ore Reserves 31.12.17	Total Ore Reserves 31.12.18	Total Ore Reserves 31.12.17	Competent person
Antamina	33.75%	OC	Sulphide Cu (Mt)	154	116	126	196	279	312	LM
			Copper (%)	1.01	1.01	0.96	0.97	0.98	0.98	
			Zinc (%)	0.15	0.15	0.18	0.18	0.17	0.17	
			Silver (g/t)	7	7	8	8	8	8	
			Molybdenum (%)	0.038	0.037	0.034	0.034	0.036	0.035	
			Sulphide Cu-Zn (Mt)	81	65	129	161	210	226	LM
			Copper (%)	0.87	0.90	0.79	0.80	0.82	0.83	
			Zinc (%)	1.97	2.20	1.98	2.01	1.98	2.06	
			Silver (g/t)	17	18	13	13	14	14	
			Molybdenum (%)	0.008	0.007	0.008	0.008	0.008	0.008	
Total Antamina			**(Mt)**	**235**	**180**	**254**	**358**	**489**	**538**	
			Copper (%)	**0.96**	**0.97**	**0.87**	**0.89**	**0.91**	**0.92**	
			Zinc (%)	**0.78**	**0.89**	**1.09**	**1.00**	**0.94**	**0.96**	
			Silver (g/t)	**10**	**11**	**11**	**10**	**11**	**11**	
			Molybdenum (%)	**0.027**	**0.027**	**0.021**	**0.022**	**0.024**	**0.024**	

Notes

Antamina: Antamina is a polymetallic (copper, zinc and molybdenum predominate) skarn deposit resulting from complex multiple intrusive events. Copper mineralization occurs mainly as chalcopyrite except for some areas of bornite, representing approximately 5% of the deposit. Zinc mineralization generally occurs as sphalerite. Other significant sulphide minerals include molybdenite and pyrite, while trace amounts of numerous silver and bismuth bearing minerals and local areas of galena (lead sulphide) are also found within the deposit.

The Mineral Resource classification is based on geologic risk factors (proportion of breccia indicator), geologic continuity (intrusive, endoskarn and exoskarn-waste) and drill hole spacing. The Antamina deposit is sufficiently well drilled to support the classification criteria. The Mineral Resources include the material reported as Ore Reserves.

Ore Reserves results were developed during the mine planning process in 2018, which is based on the end of year 2018 topography projection. The life-of-mine plan, and subsequent Ore Reserve estimation used for this statement considers only Measured and Indicated Mineral Resources; all Inferred Mineral Resources within this pit have been treated as waste. The cut-off grade for the Ore Reserves estimate varies by year in an effort to maximize the net present value of the life-of-mine. Ore Reserves are limited to the current operation tailings dam capacity. Antamina is currently assessing options to increase tailings storage capacity, which has the potential to extend the mine life and increase the Ore Reserves estimate.

In comparison with the previous year estimate, total Sulphide Ore Reserves (Cu and Cu-Zn) decreased by 49Mt mainly due to depletion during 2018 which was partly compensated by increased tailings storage capacity.

Antamina has an approved life of mine plan of 10 years (2019-2028), based on Ore Reserves. Operating permits are valid until the end of the life-of-mine.

Competent Persons

LC = Lucio Canchis, Employee of Compania Minera Antamina S.A. (AusIMM);

LM = Luis Mamani, Employee of Compañia Minera Antamina S.A. (AusIMM).

Other South America Mineral Resources (Alumbrera, Lomas Bayas, Antapaccay)

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources 31.12.18	Measured Mineral Resources 31.12.17	Indicated Mineral Resources 31.12.18	Indicated Mineral Resources 31.12.17	Measured and Indicated Resources 31.12.18	Measured and Indicated Resources 31.12.17	Inferred Mineral Resources 31.12.18	Inferred Mineral Resources 31.12.17	Competent person
Alumbrera	50%											
Bajo de la Alumbrera		UG	Ore (Mt)	117	92	6	5	123	97	1	0.3	FM
			Copper (%)	0.38	0.41	0.35	0.39	0.37	0.41	0.29	0.37	
			Gold (g/t)	0.35	0.39	0.32	0.37	0.35	0.39	0.28	0.37	
			Molybdenum (%)	0.014	0.014	0.013	0.012	0.014	0.014	0.014	0.012	
Bajo El Durazno		OC	(Mt)	5	12	12	1	16	13	6	0.6	FM
			Copper (%)	0.22	0.15	0.20	0.15	0.20	0.15	0.20	0.13	
			Gold (g/t)	0.77	0.42	0.61	0.39	0.66	0.42	0.48	0.28	
Lomas Bayas	100%											
Lomas Bayas I		OC	Oxide & Mixed (Mt)	149	151	579	615	728	766	71	76	AK
			Copper (%)	0.33	0.32	0.23	0.22	0.25	0.24	0.20	0.20	
			Soluble Copper (%)	0.16	0.16	0.11	0.11	0.12	0.12	0.10	0.10	
Lomas Bayas II		OC	Oxide & Mixed (Mt)	138	158	351	345	489	503	69	63	AK
			Copper (%)	0.32	0.31	0.23	0.23	0.25	0.26	0.10	0.10	
			Soluble Copper (%)	0.22	0.21	0.14	0.15	0.16	0.17	0.10	0.10	
Lomas Bayas III		OC	Sulphide&Mixed (Mt)	18	18	425	423	443	441	449	449	AK
			Copper (%)	0.55	0.55	0.36	0.37	0.37	0.38	0.30	0.30	
			Oxide & Mixed (Mt)	1	1	52	50	53	51	32	32	
			Copper (%)	0.26	0.26	0.24	0.24	0.24	0.24	0.20	0.20	
Antapaccay	100%	OC	(Mt)	203	182	389	434	592	616	157	161	HB
			Copper (%)	0.52	0.55	0.42	0.42	0.45	0.46	0.4	0.40	
			Gold (g/t)	0.11	0.12	0.08	0.08	0.09	0.09	0.1	0.10	
			Silver (g/t)	1.42	1.42	1.16	1.16	1.24	1.24	0.8	0.80	
			Molybdenum (%)	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	
Tintaya expansion	100%	OC	(Mt)	4	–	2	–	6	–	–	–	HB
			Copper (%)	0.88	–	0.85	–	0.87	–	–	–	
			Gold (g/t)	0.02	–	0.02	–	0.02	–	–	–	
			Silver (g/t)	3.71	–	3.42	–	3.61	–	–	–	
Coroccohuayco	100%	UG/OC	(Mt)	42	33	247	256	290	289	12	56	HB
			Copper (%)	0.97	0.85	1.25	0.91	1.21	0.90	1.13	1.08	
			Gold (g/t)	0.11	0.09	0.14	0.10	0.14	0.10	0.19	0.10	
			Silver (g/t)	3.83	3.13	4.56	2.68	4.44	2.73	2.99	3.51	
Total Other South America			**(Mt)**	**677**	**647**	**2,063**	**2,129**	**2,741**	**2,776**	**797**	**838**	
			Copper (%)	**0.44**	**0.43**	**0.42**	**0.38**	**0.42**	**0.39**	**0.30**	**0.34**	
			Gold (g/t)	**0.11**	**0.10**	**0.04**	**0.03**	**0.05**	**0.05**	**0.03**	**0.03**	
			Silver (g/t)	**0.7**	**0.6**	**0.8**	**0.6**	**0.7**	**0.6**	**0.2**	**0.4**	

Other South America Ore Reserves (Alumbrera, Lomas Bayas, Antapaccay)

Name of operation	Attributable interest	Mining method	Commodity	Proved Ore Reserves 31.12.18	Proved Ore Reserves 31.12.17	Probable Ore Reserves 31.12.18	Probable Ore Reserves 31.12.17	Total Ore Reserves 31.12.18	Total Ore Reserves 31.12.17	Competent person
Alumbrera	50%									
Bajo de la Alumbrera		UG	Ore (Mt)	67	68	2	2	70	71	FM
			Copper (%)	0.40	0.41	0.38	0.38	0.40	0.41	
			Gold (g/t)	0.39	0.39	0.38	0.37	0.39	0.39	
			Molybdenum (%)	0.013	0.013	0.014	0.014	0.013	0.013	
Bajo el Durazno		OC	Ore (Mt)	-	11	-	1.5	-	12	FM
			Copper (%)	-	0.16	-	0.16	-	0.16	
			Gold (g/t)	-	0.43	-	0.38	-	0.43	
Lomas Bayas	100%									
Lomas Bayas I		OC	Oxide & Mixed (Mt)	81	82	123	140	204	222	AK
			Copper (%)	0.29	0.28	0.22	0.22	0.25	0.24	
			Soluble Copper (%)	0.17	0.16	0.13	0.12	0.15	0.14	
Lomas Bayas II		OC	Oxide & Mixed (Mt)	120	141	202	199	322	340	AK
			Copper (%)	0.32	0.31	0.23	0.24	0.27	0.27	
			Soluble Copper (%)	0.22	0.21	0.15	0.16	0.18	0.18	
Antapaccay	100%	OC	(Mt)	201	185	257	313	458	498	HB
			Copper (%)	0.52	0.54	0.42	0.42	0.46	0.46	
			Gold (g/t)	0.10	0.11	0.08	0.08	0.09	0.09	
			Silver (g/t)	1.34	1.41	1.16	1.15	1.24	1.25	
Tintaya	100%	OC	(Mt)	4	–	1	–	5	–	HB
Expansion			Copper (%)	0.85	–	0.86	–	0.85	–	
			Gold (g/t)	0.02	–	0.02	–	0.02	–	
			Silver (g/t)	3.54	–	3.62	–	3.56	–	
Coroccohuayco	100%									
		OC	(Mt)	22	22	41	41	63	63	HB
			Copper (%)	0.75	0.75	0.56	0.56	0.63	0.63	
			Gold (g/t)	0.08	0.08	0.06	0.06	0.07	0.07	
			Silver (g/t)	2.75	2.75	1.57	1.57	1.98	1.98	
		UG	(Mt)	9	9	112	112	121	121	JA
			Copper (%)	0.82	0.82	1.25	1.25	1.22	1.22	
			Gold (g/t)	0.09	0.09	0.12	0.12	0.12	0.12	
			Silver (g/t)	3.02	3.02	3.93	3.93	3.86	3.86	
Total Other South America			**(Mt)**	**504**	**518**	**739**	**809**	**1,243**	**1,327**	
			Copper (%)	**0.45**	**0.42**	**0.47**	**0.46**	**0.46**	**0.45**	
			Gold (g/t)	**0.10**	**0.10**	**0.05**	**0.05**	**0.07**	**0.07**	
			Silver (g/t)	**0.8**	**0.7**	**1.3**	**1.1**	**1.1**	**0.9**	

Notes

Bajo de La Alumbrera and Bajo El Durazno:

The **Bajo de la Alumbrera** copper-gold porphyry deposit is located in the Hualfin district, Belen department of the Catamarca province, in the northwest region of Argentina. The orebody consists of primary sulphide mineralised ore which comprises disseminated, vein and fracture controlled chalcopyrite in altered dacite and andesite host rocks, with minor chalcocite and covellite in the enriched zone that surrounds the major faults.

The variations from the 31 December 2017 published statement are a result of mining and topography adjustment.

The Mineral Resources are estimated using Ordinary Kriging interpolation within geological constraints from an assay database comprising some 116,000m of diamond drilling and 15,000m of reverse circulation drilling. Mineral Resources with reasonable prospects to be economically mined were assessed at long term metal prices and updated operating costs using a cut-off grade of 0.43% of equivalent copper.

Ore Reserves are based on an economic and operative solid generated for an underground mining process (sub-level caving) with a cut-off grade of 0.5% of equivalent copper. The economic cut-off is based on economic parameters and metallurgical recoveries.

The **Bajo el Durazno** deposit belongs to the mining district of Agua de Dionisio and is located 5km northeast of the Bajo de la Alumbrera deposit and 2km from Minera Alumbrera's concentrator plant. The deposit is located within the Farallón Negro volcanic complex, which is eroded, deformed by faults and mineralized, resulting in a "depressed geomorphological" with hydrothermal alteration known as "Bajo".

39,444m of diamond drilling was completed between 2009 and 2015. Mineral Resources are estimated using Ordinary Kriging interpolation for copper and gold. The size of the block in the geological model (10x10x15) was based on geological criteria stemming from the geological interpretation and the proposed drilling grid.

The Mineral Resources were estimated using a cut-off 0.75 g/t for gold-equivalents within an economic shell. The difference from 2017 is due to a change in the method of exploitation, from open pit to underground.

All Ore Reserves reported in the last statement were mined between January and August 2018 with a conventional mining method, open pit. Mining operations completed in August 2018 and the site is currently on care and maintenance. In 2018, ore reserves are not reported.

Lomas Bayas (I) – Lomas Bayas (III): Lomas Bayas is a low grade copper-molybdenum deposit resulting from the intrusion of several porphyry and breccia systems that were later exposed to leaching and subsequent supergene enrichment and *in situ* oxidation. Green copper oxides, copper sulphates in various forms and less partially mixed ores are the main source of ore for the existing SX/EW operation. The copper oxides-sulphate mineralisation is the basis of the Lomas Bayas Ore Reserves (Lomas Bayas I).

Mineral Resources are estimated using Ordinary Kriging on a block model that includes historic drill holes totalling 318,788m and sampled at 2m intervals. Ore Reserves are as of 31 December 2018 using projected topography; operational pit life-of-mine developed in 2018; cut-off grade Heap: 0.27% CuT and ROM: 0.07% CuT. Lomas Bayas (I) Ore Reserves have been depleted to account for ongoing extraction. The Lomas Bayas (III) Mineral Resources estimates sulphides in a pit shell calculated using Measured, Indicated and Inferred Mineral Resources; Oxides-Mixed ore within this pit are also considered Mineral Resources that will eventually feed the current SX/EW operation.

Lomas Bayas (II): This low grade copper deposit is located 2km south of Lomas I pit, in the same district and geological environment as Lomas Bayas deposit. The main difference is a larger presence of water soluble copper oxides and lower geotechnical rock quality. The Lomas II block model includes historic drill holes totalling 127,369m and sampled at 2m intervals. Mineral Resources are estimated using Ordinary Kriging on a block model. Ore Reserves are as of 31 December 2018 and consider the operational life-of-mine and cut-off grades (Heap: 0.27% CuT and ROM: 0.07% CuT). Lomas Bayas (II) Ore Reserves have been depleted to account for ongoing extraction.

The Lomas Bayas SX/EW plant is fed by both Lomas Bayas (I) and Lomas Bayas (II) and has a current life of mine plan that extends to 2028; permits for the operation are valid to the end of the life of the mine.

Antapaccay: The Antapaccay orebody is located 10km southwest of Tintaya, and together with Coroccohuayco is part of the Tintaya mineralised district. It is a sulphide mineralised system comprising disseminated, vein and fracture controlled chalcopyrite and bornite in altered quartz–monzonite and diorite in a limestone host rock, with some mineralised exoskarn areas and minor copper oxides and copper carbonates in the upper part of the deposit.

Antapaccay Ore Reserves and Mineral Resources as at 31 December 2018: Mineral Resource categorisation is based on assessment of orebody and grade continuity, structural complexity, data quality, adequacy of data coverage, and reasonable prospects of economical extraction. The Mineral Resources estimation is based on a block model with grade interpolation by using Ordinary Kriging. Mineral Resources are stated at defined internal copper cut–off, which is maintained at 0.15% TCu. Ore Reserves are then derived from Measured and Indicated Mineral Resources after applying economical and technical modifying factors.

The Tintaya pit expansion has been included in the 2018 Antapaccay Ore Reserves, based on a review of the remnant resources in the Tintaya pit. An approval process of relevant environmental and social permits is expected to be completed during 2019.

The deposit geology model and Mineral Resources estimate has been updated in 2018 using a drill hole database that now includes over 282,223m of total drilling data. The last drilling of geological, geometallurgical and geotechnical infill was carried out between May and October of 2018 with 26,406 meters. The major variations from the previous published Mineral Resource statement are due to the inclusion of new infill drilling, an updated geological model and block model estimation.

The estimated mine life for Antapaccay is 11 years ending in 2029, and two years for Tintaya ending in 2021. Operation permits are valid until the end of the life of mine including the Tintaya pit.

Coroccohuayco: The Coroccohuayco copper–gold skarn deposit is located 9km southeast of Tintaya. Together with Tintaya and Antapaccay this orebody is part of the Tintaya mineralised district. The main copper bearing minerals are bornite, chalcopyrite and chalcocite. The Coroccohuayco orebody is defined as a copper skarn deposit, which consists of Cretaceous sedimentary rocks of the Ferrobamba and Mara formation intruded by monzonitic plutons of the Eocene–Oligocene Andahuaylas–Yauri batholiths. The deposit geology model and Mineral Resources and Reserves estimate was updated as at 31 December 2016, and the same resources and reserves are being declared for 31 December 2018, given there has been limited geological drilling completed during 2017-18.

Portfolio changes: Punitaqui was sold to Xiana Mining in November 2018.

Competent Persons

AZ = Americo Zuzunaga, Employee of BISA (AusIMM).

FM = Flavio Montini, Employee of Glencore (AusIMM).

HB = Heller Bernabé, Employee of Glencore (AusIMM).

AK = Aldo Kong, Employee of Glencore (AusIMM).

JA = Javier Aymachoque, Independent Senior Consulting (AusIMM).

Metals and Minerals Copper

Australia Mineral Resources (Ernest Henry, Mount Isa, Cobar)

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources 31.12.18	Measured Mineral Resources 31.12.17	Indicated Mineral Resources 31.12.18	Indicated Mineral Resources 31.12.17	Measured and Indicated Resources 31.12.18	Measured and Indicated Resources 31.12.17	Inferred Mineral Resources 31.12.18	Inferred Mineral Resources 31.12.17	Competent person
Ernest Henry												
Underground	70%[1]	UG	(Mt)	14.2	13.2	58.6	67.1	72.8	80.3	15.6	15.0	CS
			Copper (%)	1.32	1.33	1.17	1.18	1.20	1.20	1.17	1.0	
			Gold (g/t)	0.71	0.69	0.62	0.62	0.64	0.63	0.62	0.6	
E1	100%	OC	(Mt)	4.6	4.6	5.5	5.5	10.1	10.1	0.4	0.4	CS
			Copper (%)	0.70	0.70	0.75	0.75	0.73	0.73	0.9	0.9	
			Gold (g/t)	0.20	0.20	0.23	0.23	0.22	0.22	0.3	0.3	
Monakoff	100%	OC	(Mt)	–	–	2.4	2.4	2.4	2.4	0.1	0.1	CS
			Copper (%)	–	–	0.95	0.95	0.95	0.95	0.8	0.8	
			Gold (g/t)	–	–	0.30	0.30	0.30	0.30	0.2	0.2	
Mount Isa	100%											
X41 Mine 500, 650,		UG	(Mt)	26.1	23.5	11.8	13.4	37.9	36.9	3.0	6.8	HB
1100 & 1900 Orebodies			Copper (%)	1.84	1.89	1.68	1.75	1.79	1.80	1.6	1.7	
Enterprise Mine 3000		UG	(Mt)	20.5	23.7	6.2	5.6	26.7	29.3	0.9	1.4	HB
& 3500 Orebodies			Copper (%)	2.43	2.51	2.25	2.28	2.39	2.46	2.3	2.2	
Black Rock Cave		UG	(Mt)	–	–	1.4	1.4	1.4	1.4	0.6	0.6	HB
			Copper (%)	–	–	5.88	5.88	5.88	5.88	4.8	4.8	
Open Pit		OC	(Mt)	47.5	47.5	79.0	79.0	126.6	126.6	135	135	HB
			Copper (%)	1.41	1.41	1.24	1.24	1.30	1.30	0.9	0.9	
Cobar	100%	UG	(Mt)	3.2	3.1	2.8	2.9	6.0	6.0	5.4	5.3	EA
			Copper (%)	5.72	5.93	5.31	5.26	5.53	5.61	5.37	5.6	
			Silver (g/t)	23	23.7	23	22.5	23.0	23.1	20	23	
Total Australia			**(Mt)**	**116**	**116**	**168**	**177**	**284**	**293**	**161**	**165**	
			Copper (%)	**1.77**	**1.82**	**1.37**	**1.37**	**1.53**	**1.54**	**1.1**	**1.1**	
			Gold (g/t)	**0.09**	**0.09**	**0.23**	**0.23**	**0.17**	**0.18**	**0.06**	**0.06**	
			Silver (g/t)	**0.6**	**0.6**	**0.4**	**0.4**	**0.5**	**0.5**	**0.7**	**0.7**	

1 Glencore's effective interest in Ernest Henry underground varies between certain defined areas. The net effect of such is described in the notes.

Australia Ore Reserves (Ernest Henry, Mount Isa, Cobar)

Name of operation	Attributable interest	Mining method	Commodity	Proved Ore Reserves 31.12.18	Proved Ore Reserves 31.12.17	Probable Ore Reserves 31.12.18	Probable Ore Reserves 31.12.17	Total Ore Reserves 31.12.18	Total Ore Reserves 31.12.17	Competent person
Ernest Henry	70%									
Underground		UG	Ore (Mt)	10.5	10.2	32.5	41.2	43.1	51.4	MC
			Copper (%)	1.49	1.50	0.91	0.96	1.05	1.07	
			Gold (g/t)	0.79	0.77	0.46	0.49	0.54	0.54	
Mount Isa	100%									
X41 Mine 500, 650,		UG	Ore (Mt)	5.1	5.5	13.2	12.4	18.3	17.9	GC
1100 & 1900 Orebodies			Copper (%)	1.79	1.82	1.71	1.77	1.73	1.79	
Enterprise Mine 3000		UG	Ore (Mt)	12.4	6.3	3.6	12.1	16.0	18.5	GC
& 3500 Orebodies			Copper (%)	2.17	2.34	2.44	2.19	2.23	2.24	
Black Rock Cave		UG	Ore (Mt)	–	–	1.4	1.4	1.4	1.4	MJ
			Copper (%)	–	–	4.51	4.51	4.51	4.51	
Cobar	100%	UG	Ore (Mt)	3.9	3.5	2.5	1.9	6.4	5.4	CK
			Copper (%)	4.01	4.26	3.5	3.94	3.81	4.15	
			Silver (g/t)	16.3	17.1	14.7	14.6	15.7	16.2	
Total Australia			**(Mt)**	**32**	**26**	**53**	**69**	**85**	**95**	
			Copper (%)	**2.11**	**2.16**	**1.43**	**1.48**	**1.68**	**1.66**	
			Gold (g/t)	**0.26**	**0.31**	**0.28**	**0.29**	**0.27**	**0.29**	
			Silver (g/t)	**2.0**	**2.3**	**0.7**	**0.4**	**1.2**	**0.9**	

Notes

Ernest Henry Underground: The current expected mine life is seven years (completion in 2026) with the Mining Lease tenements also due to expire 2026.

Copper and gold mineralisation occurs in a breccia comprised of strongly altered and replaced intermediate volcanic fragments in a matrix assemblage of predominantly magnetite, chalcopyrite and carbonate. Copper occurs as chalcopyrite and gold is strongly associated with chalcopyrite.

In October 2016 Evolution Mining purchased an economic interest in the copper and gold production from EHM. Glencore's retains a 70% interest in the copper revenue from a defined life of mine area, and 51% interest in copper, gold and silver revenue outside the defined LOM area.

Glencore's net interest is 63.3% of the total copper resource, 18.5% of the total gold resource and 70% of the total copper reserve.

Changes to the Mineral Resource and Ore Reserve are primarily due to depletion through mining.

E1: Economic mineralisation at E1 occurs as breccia-hosted mineralisation within the footwall volcanics at E1 North, and as strata-bound, replacement style mineralisation within the mineralised sedimentary units at E1 North, Central, South and East. Mine lease tenements expire in December 2032.

Monakoff: Economic mineralisation at Monakoff and Monakoff East occurs in very-fine to medium grained steeply dipping metasediment units. Mine lease tenements expire in October 2032.

Mount Isa X41 and Enterprise Copper Mine: Mineralisation occurs generally as breccia hosted massive to disseminated chalcopyrite in "silica dolomite" altered pyritic dolomitic siltstone.

The Mineral Resource estimates for X41 and Enterprise were updated and depleted. The Resource model update for X41 increased the tonnage by 0.8Mt. Enterprise tonnage decreased by 0.1Mt. The Mineral Resources were depleted by 3.7Mt and 2.9Mt respectively, including both mining and sterilisation.

Mining depletion, sterilisation and changes to mine design amounted to a net 0.4Mt increase in the X41 and 2.4Mt decrease in the Enterprise Ore Reserves.

Mount Isa Open pit: Copper mineralisation occurs generally as breccia hosted massive to disseminated copper minerals in "silica dolomite" altered pyritic dolomitic siltstone. The copper mineralisation consists primarily of chalcopyrite, the remainder being oxidised or partially oxidised, with a minor amount of supergene chalcocite mineralisation. The 2018 Mineral Resource is reported inside an optimised pit shell using a cut-off grade of 0.5% Cu.

Black Rock Cave: Copper mineralisation occurs generally within a Chalcocite Zone that lies above the Leached Primary material. The zone is interpreted to lie outside of the Silica-Dolomite alteration. This Resource is reported using a cut-off grade of 2.0% Cu.

The underground life of mine estimate for the X41, Enterprise, and the Black Rock Cave is 5 years (2023) with the tenements due to expire in 18 years (2036).

Cobar: The expected remaining life of mine is approximately 5 years based on Ore Reserves and approximately 10 years based on Mineral Resources, although Cobar has previously been able to extend its expected life of mine through exploratory drilling over the past 50 years. The expiry date of relevant mining/concession licences is 24 June 2028.

Economic mineralisation at Cobar occurs mostly as narrow lenses with short strike lengths that are depth extensive. Lenses consist of vein or semi massive to massive chalcopyrite hosted by sub-vertical quartz-chlorite shear zones within a siltstone unit. The Cobar Mineral Resources and Ore Reserves are reported within five 'systems': Western, Eastern, QTS North, QTS South and QTS Central.

A 0.1Mt increase in the total Mineral Resource is the result of resource growth, as define by drilling and reinterpretation, exceeding mine depletion.

The application of a lower mine cut-off grade, resource upgrade in both QTS North and Western along with revised mining factors resulted in a 1.0Mt increase in Ore Reserves.

Competent Persons

CS = Colin Stelzer, Glencore Copper (AusIMM).

GC = Gibson Chitumbura, Glencore Copper (AusIMM).

HB = Helen Barnes, Glencore Copper (AusIMM).

MC = Mike Corbett, Glencore Copper (AusIMM).

EA = Eliseo Apaza, Glencore Copper (AusIMM).

CK = Callum Ker, Integrated Auditing Resources (AusIMM).

Other projects Mineral Resources

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources 31.12.18	Measured Mineral Resources 31.12.17	Indicated Mineral Resources 31.12.18	Indicated Mineral Resources 31.12.17	Measured and Indicated Mineral Resources 31.12.18	Measured and Indicated Mineral Resources 31.12.17	Inferred Mineral Resources 31.12.18	Inferred Mineral Resources 31.12.17	Competent person
El Pachón	100%	OC	(Mt)	534	534	1,054	1,056	1,588	1,590	1,524	1,528	FM
			Copper (%)	0.67	0.67	0.49	0.49	0.55	0.55	0.41	0.41	
			Silver (g/t)	2.4	2.4	2.0	2.0	2.2	2.2	1.8	1.8	
			Molybdenum (%)	0.013	0.013	0.011	0.011	0.012	0.012	0.009	0.009	
West Wall	50%		(Mt)	–	–	861	495	861	495	1,072	970	MMV
Copper Project			Copper (%)	–	–	0.51	0.55	0.51	0.55	0.42	0.48	
			Gold (g/t)	–	–	0.05	0.05	0.05	0.05	0.05	0.05	
			Molybdenum (%)	–	–	0.008	0.009	0.008	0.009	0.006	0.008	
Total Other projects			**(Mt)**	**534**	**534**	**1,915**	**1,551**	**2,449**	**2,085**	**2,596**	**2,498**	
			Copper (%)	**0.67**	**0.67**	**0.50**	**0.51**	**0.54**	**0.55**	**0.41**	**0.44**	
			Gold (g/t)	–	–	**0.02**	**0.02**	**0.02**	**0.01**	**0.02**	**0.02**	
			Silver (g/t)	**2.4**	**2.4**	**1.1**	**1.4**	**1.4**	**1.7**	**1.1**	**1.1**	
			Molybdenum (%)	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	

Notes

El Pachón: Located in the southwest of San Juan Province of Argentina, the El Pachón orebody is a porphyry copper-molybdenum deposit in which two major stages of sulphide mineralisation contributed to the formation of the orebody. The bulk of the ore takes the form of disseminated Chalcopyrite-Molibdenite primary sulphides on top which an immature, relatively small copper enrichment blanket has been developed. In this upper part of the deposit Chalcocite and minor Covellite are partially replacing the primary Chalcopyirite ore. Mineral Resources stated herein are based on assay and geology information from 135,000m of mainly diamond drill holes. Mineral Resources have been classified using a combination of criteria including geological continuity and Kriging parameters. Mineral Resources are constrained by the use of an economic pit shell determined using Measured, Indicated and Inferred Mineral Resources and current assumption for the economic and technical modifying factors conditioning the resource pit. The decrease in total Mineral Resources compared to the 2017 report is mainly in the inferred category and affected by changes in long-term prices, mining and selling costs.

West Wall: The West Wall Copper Project is located in the central Chilean Andes, approximately 100km NNE of Santiago. Glencore and Anglo American each have a 50% interest in the mining company West Wall SCM which holds the project. West Wall is a copper-molybdenum porphyry, with two distinct mineralized zones; Lagunillas to the south of the prospect, and West Wall Norte (WWN) 2km to the north of Lagunillas. The mineralization zones are part of an extensive NNE striking hydrothermal alteration zone of approximately 9km by 4km.

The Mineral Resource was updated during 2018, recognizing a late stage, poorly mineralised, porphyry intrusive system which was superimposed on the previous model. The estimation parameters for copper were reviewed as well, realising stronger vertical trends than before. The Mineral Resource was classified into Inferred and Indicated categories only, taking continuity of mineralisation and geological knowledge into consideration. The Mineral Resource is reported within an economic pit shell at a cut-off of 0.2% Cu for 2018, as opposed to the previous cut-off of 0.3% Cu used in 2017.

Competent Persons

FM = Flavio Montini, Employee of Glencore (AusIMM).

MMV = Manuel Machuca Valderrama, Employee of Anglo American for the West Wall Project (AusIMM).

Metals and Minerals
Zinc

Kazzinc Mineral Resources

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources 31.12.18	Measured Mineral Resources 31.12.17	Indicated Mineral Resources 31.12.18	Indicated Mineral Resources 31.12.17	Measured and Indicated Resources 31.12.18	Measured and Indicated Resources 31.12.17	Inferred Mineral Resources 31.12.18	Inferred Mineral Resources 31.12.17	Competent person
Maleevsky	69.7%	UG	(Mt)	4.3	5.2	4.1	6.6	8.4	11.8	2.3	4.3	AC
			Zinc (%)	7.3	9.4	6.7	7.7	7.0	8.4	6	7	
			Lead (%)	1.1	1.4	1.2	1.3	1.2	1.3	1	1	
			Copper (%)	2.4	2.8	2.1	2.4	2.3	2.6	2	2	
			Silver (g/t)	82	81	75	73	79	76	66	62	
			Gold (g/t)	0.5	0.6	0.5	0.4	0.5	0.5	0.5	0.4	
Ridder-Sokolny	69.7%	UG	(Mt)	16.2	16.5	12.8	13.2	29.0	29.7	6.1	6.1	AC
			Zinc (%)	1.5	1.4	1.4	1.2	1.5	1.3	1	1	
			Lead (%)	0.7	0.7	0.6	0.5	0.6	0.6	1	1	
			Copper (%)	0.7	0.7	0.6	0.6	0.7	0.6	1.2	1.2	
			Silver (g/t)	25	24	30	26	27	25	23	22	
			Gold (g/t)	1.8	1.7	1.4	1.3	1.6	1.5	1.5	1.6	
Tishinsky	69.7%	UG	(Mt)	9.7	6.5	0.4	0.5	10.1	7.0	2.4	1.6	AC
			Zinc (%)	5.5	5.5	5.8	10.1	5.5	5.8	4	6	
			Lead (%)	1.0	0.9	1.8	2.2	1.0	1.0	1	1	
			Copper (%)	0.6	0.6	0.4	0.9	0.6	0.6	0.4	0.4	
			Silver (g/t)	10	11	10	21	10	11	6	9	
			Gold (g/t)	0.8	0.8	0.3	1.0	0.7	0.8	0.5	0.4	
Shubinsky	69.7%	UG	(Mt)	0.2	0.5	0.2	0.7	0.4	1.2	0.1	0.2	AC
			Zinc (%)	2.6	2.7	2.5	2.7	2.5	2.7	2	1	
			Lead (%)	0.4	0.4	0.6	0.4	0.5	0.4	1	0.4	
			Copper (%)	1.2	2.1	0.6	1.8	1.8	1.9	0.4	1.8	
			Silver (g/t)	18	20	16	23	23	22	15	20	
			Gold (g/t)	0.3	0.4	0.3	0.6	0.6	0.5	0.2	0.5	
Staroye Tailings	69.7%		(Mt)	–	–	2.4	2.4	2.4	2.4	1.4	1.4	AC
Dam			Silver (g/t)	–	–	11	11	11	11	10	10	
			Gold (g/t)	–	–	1.0	1.0	1.0	1.0	1.0	0.8	
Chashinskoye	69.7%	OC	(Mt)	–	–	58	58	58	58	30	30	AC
Tailings Dam			Silver (g/t)	–	–	5	5	5	5	5	5	
			Gold (g/t)	–	–	0.7	0.7	0.7	0.7	0.5	0.5	
Shaimerden	69.7%	OC	(Mt)	–	–	1.4	1.6	1.4	1.6	–	–	AC
Stockpiles			Zinc (%)	–	–	22	22	22	22	–	–	
Dolinnoe	69.7%	UG	(Mt)	2.5	0.9	2.4	2.8	4.8	3.7	8.0	8.1	AC
			Zinc (%)	1.4	2.8	1.2	1.4	1.3	1.7	1	1	
			Lead (%)	0.8	1.4	0.6	0.7	0.7	0.9	0.4	0.4	
			Copper (%)	0.2	0.4	0.2	0.2	0.2	0.2	0.1	0.1	
			Silver (g/t)	69	90	38	44	54	56	16	22	
			Gold (g/t)	3.7	7.5	3.0	4.1	3.4	4.9	2.0	2.1	
Obruchevskoe	69.7%	UG	(Mt)	–	–	5.4	5.4	5.4	5.4	4.0	4.0	AC
			Zinc (%)	–	–	7.3	7.3	7.3	7.3	4	4	
			Lead (%)	–	–	3.2	3.2	3.2	3.2	2	2	
			Copper (%)	–	–	0.9	0.9	0.9	0.9	1	1	
			Silver (g/t)	–	–	37	37	37	37	33	33	
			Gold (g/t)	–	–	1.1	1.1	1.1	1.1	0.7	0.7	
Zhairemsky	69.7%	OC	(Mt)	22.1	23	0.6	0.6	22.7	24	1.0	1.0	AC
Zapadny			Zinc (%)	4.1	4.1	4.6	4.7	4.1	4.1	4	4	
			Lead (%)	2.4	2.4	0.9	0.9	2.4	2.4	3	3	
			Silver (g/t)	25	26	27	27	25	26	30	30	
Zhairemsky	69.7%	OC	(Mt)	36.5	36.5	3.5	3.5	40.0	40.0	–	–	AC
Dalnezapadny			Zinc (%)	4.4	4.4	3.9	3.9	4.3	4.3	–	–	
			Lead (%)	1.2	1.2	0.9	0.9	1.2	1.2	–	–	
			Silver (g/t)	6	6	3	3	6	6	–	–	

Metals and Minerals Zinc

Kazzinc Mineral Resources (continued)

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources 31.12.18	Measured Mineral Resources 31.12.17	Indicated Mineral Resources 31.12.18	Indicated Mineral Resources 31.12.17	Measured and Indicated Resources 31.12.18	Measured and Indicated Resources 31.12.17	Inferred Mineral Resources 31.12.18	Inferred Mineral Resources 31.12.17	Competent person
Zhairemsky	69.7%	OC	(Mt)	0.6	0.9	1.3	1.7	1.9	2.6	0.1	0.1	AC
Ushkatyn			Zinc (%)	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	
			Lead (%)	5.3	6.0	3.7	3.9	4.2	4.6	3	3	
			Silver (g/t)	35	39	27	28	30	32	18	16	
Uzhynzhal	100%	OC	(Mt)	–	–	–	–	–	–	17.1	14.0	AC
			Zinc (%)	–	–	–	–	–	–	1	1	
			Lead (%)	–	–	–	–	–	–	3	4	
			Silver (g/t)	–	–	–	–	–	–	47	57	
Novo-	69.7%		(Mt)	–	–	–	–	–	–	30.0	30.0	AC
Leninogorskoye			Zinc (%)	–	–	–	–	–	–	5	5	
			Lead (%)	–	–	–	–	–	–	2	2	
			Copper (%)	–	–	–	–	–	–	0.2	0.2	
			Silver (g/t)	–	–	–	–	–	–	40	40	
			Gold (g/t)	–	–	–	–	–	–	2	2	
Chekmar	69.7%		(Mt)	–	–	–	–	–	–	55	55	AC
			Zinc (%)	–	–	–	–	–	–	3	3	
			Lead (%)	–	–	–	–	–	–	1	1	
			Copper (%)	–	–	–	–	–	–	0.4	0.4	
			Silver (g/t)	–	–	–	–	–	–	13	13	
			Gold (g/t)	–	–	–	–	–	–	0.5	0.3	
Total Polymetallic Kazzinc			**(Mt)**	**92**	**90**	**92**	**97**	**185**	**187**	**157**	**156**	
			Zinc (%)	**4.0**	**4.1**	**1.5**	**1.7**	**2.7**	**2.8**	**2**	**3**	
			Lead (%)	**1.4**	**1.5**	**0.4**	**0.5**	**0.9**	**1.0**	**1**	**1**	
			Copper (%)	**0.3**	**0.3**	**0.2**	**0.3**	**0.3**	**0.3**	**0.1**	**0.3**	
			Silver (g/t)	**20**	**20**	**15**	**16**	**17**	**18**	**22**	**23**	
			Gold (g/t)	**0.5**	**0.5**	**0.8**	**0.8**	**0.7**	**0.7**	**1**	**1**	
Vasilkovskoye	69.7%	OC	(Mt)	78	84	46	48	124	132	–	0.1	AC
(Gold)			Gold (g/t)	2.1	2.1	1.7	1.7	1.9	2.0	–	0.9	

Metals and Minerals Zinc

Kazzinc Ore Reserves

Name of operation	Attributable interest	Mining method	Commodity	Proved Ore Reserves 31.12.18	Proved Ore Reserves 31.12.17	Probable Ore Reserves 31.12.18	Probable Ore Reserves 31.12.17	Total Ore Reserves 31.12.18	Total Ore Reserves 31.12.17	Competent Person
Maleevsky	69.7%	UG	Ore (Mt)	3.3	3.2	4.2	5.5	7.5	8.7	AC
			Zinc (%)	7.0	7.3	4.2	5.0	5.4	5.9	
			Lead (%)	1.0	1.0	0.8	0.8	0.9	0.9	
			Copper (%)	1.4	2.0	1.4	1.6	1.4	1.7	
			Silver (g/t)	73	57	51	46	61	50	
			Gold (g/t)	0.4	0.4	0.3	0.3	0.4	0.3	
Ridder-Sokolny	69.7%	UG	Ore (Mt)	7.5	7.8	5.2	5.7	12.7	13.5	AC
			Zinc (%)	1.4	1.1	1.3	0.9	1.3	1.1	
			Lead (%)	0.6	0.5	0.5	0.4	0.6	0.4	
			Copper (%)	0.5	0.4	0.6	0.5	0.5	0.4	
			Silver (g/t)	23	19	27	19	25	19	
			Gold (g/t)	1.4	1.3	0.9	0.8	1.2	1.1	
Tishinsky	69.7%	UG	Ore (Mt)	4.4	4.4	0.9	0.9	5.3	5.3	AC
			Zinc (%)	5.0	4.9	4.7	3.7	4.9	4.7	
			Lead (%)	0.9	0.8	1.1	0.6	1.0	0.8	
			Copper (%)	0.6	0.5	0.4	0.4	0.5	0.5	
			Silver (g/t)	9	10	8	8	9	9	
			Gold (g/t)	0.7	0.7	0.4	0.5	0.6	0.7	
Shubinsky	69.7%	UG	Ore (Mt)	0.1	0.03	0.1	0.1	0.1	0.2	AC
			Zinc (%)	2.5	2.0	2.5	2.5	2.5	2.4	
			Lead (%)	0.4	0.2	0.6	0.3	0.5	0.3	
			Copper (%)	1.5	1.5	0.8	1.7	1.1	1.7	
			Silver (g/t)	21	14	20	16	20	16	
			Gold (g/t)	0.3	0.3	0.4	0.3	0.3	0.3	
Shaimerden	69.7%	OC	Ore (Mt)	–	–	1.4	1.6	1.4	1.6	AC
Stockpiles			Zinc (%)	–	–	22.0	22	22.0	22	
Dolinnoe	69.7%	UG	Ore (Mt)	1.8	1.0	1.5	1.6	3.3	2.7	AC
			Zinc (%)	1.4	2.2	1.2	1.4	1.3	1.7	
			Lead (%)	0.8	1.1	0.6	0.7	0.7	0.9	
			Copper (%)	0.2	0.3	0.2	0.2	0.2	0.2	
			Silver (g/t)	74	72	41	53	59	60	
			Gold (g/t)	3.8	6.0	3.0	4.5	3.4	5.0	
Zhairemsky	69.7%	OC	Ore (Mt)	21.7	23.3	0.6	0.6	22.3	23.9	AC
Zapadny			Zinc (%)	4.0	4.0	4.4	4.3	4.0	4.0	
			Lead (%)	2.3	2.4	0.9	0.9	2.3	2.3	
			Silver (g/t)	25	26	26	26	25	26	
Zhairemsky	69.7%	OC	Ore (Mt)	37.1	38.0	2.8	2.9	39.9	40.9	AC
Dalnezapadny			Zinc (%)	4.2	4.2	3.8	3.7	4.1	4.1	
			Lead (%)	1.2	1.2	0.9	0.9	1.2	1.2	
			Silver (g/t)	6	6	2	2	5	5	
Zhairemsky	69.7%	OC	Ore (Mt)	0.08	0.7	0.2	1.3	0.3	2.0	AC
Ushkatyn			Zinc (%)	0.1	0.1	0.1	0.1	0.1	0.1	
			Lead (%)	4.4	6.3	4.1	4.2	4.2	5.0	
			Silver (g/t)	46	41	29	29	34	33	
Total Polymetallic Kazzinc			**(Mt)**	**76**	**78**	**16.8**	**20.2**	**93**	**99**	
			Zinc (%)	**3.9**	**3.9**	**4.4**	**4.3**	**4.0**	**4.0**	
			Lead (%)	**1.4**	**1.5**	**0.7**	**0.8**	**1.3**	**1.4**	
			Copper (%)	**0.1**	**0.2**	**0.6**	**0.6**	**0.2**	**0.3**	
			Silver (g/t)	**18**	**16**	**27**	**26**	**19**	**18**	
			Gold (g/t)	**0.3**	**0.3**	**0.7**	**0.7**	**0.4**	**0.3**	
Vasilkovskoye	69.7%	OC	Ore (Mt)	51	70	47	38	98	108	AC
(Gold)			Gold (g/t)	2.1	2.2	1.8	1.8	1.8	2.1	

Notes

Remaining mine life: different for each mine, ranging from 5 to 20 years (except Shubinsky as noted below). Expiry date of relevant mining/concession licences: different for each mine, ranging from February 2019 to March 2041. There is a routine licence extension procedure in Kazakhstan which Kazzinc undertakes as required.

Maleevsky: It is a typical syngenetic VMS deposit hosting ores of sulphide-polymetallic formation (with associated gold and silver).

Infill drilling in various parts of the deposit enabled conversion of Inferred resources to Indicated, particularly near the active mining fronts.

The mined material from Maleevsky during 2018 was 2.0Mt at 6.6% Zn, 1.0% Pb, 1.8% Cu, 64g/t Ag and 0.5g/t Au.

Ridder-Sokolny: The gold-polymetallic deposit is also VMS type of syngenetic deposits hosting ores of gold bearing sulphide-polymetallic formation.

Mineral Resource changes are due to mining exploitation during 2018.

For Ridder-Sokolny, Mineral Resources and Ore Reserves are reported as totals for Polymetallic and Cu-type mineralisation combined. Remodelling is underway, and will most likely lead to an overall increase in grades.

The mined material from Ridder-Sokolny during 2018 was 1.6Mt at 0.4% Zn, 0.2% Pb, 0.6% Cu, 6g/t Ag and 2.5g/t Au.

Tishinsky: It is a syngenetic VMS deposit of Au- and Ag-bearing sulfide polymetallic ores.

Tishinsky Mineral Resources has slightly increased, due to several factors, including reinterpretation of geological wireframes and ongoing exploration. Changes to the Indicated zinc grade are due to the sterilisation of very high grade pillars.

The mined material from Tishinsky during 2018 was 0.7Mt at 5.0% Zn, 0.9% Pb, 0.5% Cu, 10g/t Ag and 0.7g/t Au.

Shubinsky: The polymetallic deposit is a syngenetic VMS deposit hosting ores of sulphide-polymetallic formation (with associated gold and silver).

Orebody and structural interpretation, modelling and classification of the Mineral Resource was completed on the basis of additional geological information and improved systems.

Resource tonnage was reduced as a result of a sterilization campaign in 2017. Only tonnes in the recoverable sill pillar and beneath past production zones are deemed to have a realistic potential of recovery. This had no impact on the Reserve. Shubinsky is expected to complete in 2019.

The mined material from Shubinsky during 2018 was 0.2Mt, 1.9% Zn, 0.37% Pb, 1.2% Cu, 17g/t Ag and 0.5g/t Au.

Shaimerden: The Shaimerden stockpile is composed of high-grade, crushed zinc oxide ore which is not amenable to the concentration process; it is directly sent to the Ridder Zinc refinery. Total material processed during 2018 was 213Kt at 20.7% Zn.

Dolinnoe: The Dolinnoe deposit is situated in the south-eastern portion of the Ridder mining district in the Rudnyi Altay geotectonic block. Gold is the main mineral of economic interest at Dolinnoe

Orebody and structural interpretation, modelling and classification of the Mineral Resource was completed on the basis of underground infill drilling campaign. Changes to the resources (and subsequent reserves) are due to continuous drilling of the deposit.

The mined material from Dolinnoe during 2018 was 0.2Mt, 2.1% Zn, 1.2% Pb, 0.5% Cu, 85g/t Ag and 6.8g/t Au.

Obruchevskoe: The Obruchevskoe deposit is situated in the deepest south-eastern portion of the Ridder mining district in the Rudnyi Altay geotectonic block. Veinlet-disseminated polymetallic mineralisation predominates at Obruchevskoe.

A feasibility study and confirmation drilling, regarding the mining of the Obruchevskoe deposit is underway.

Chekmar: The Chekmar deposit is comprised of two main poylmetallic mineralized zones, Chekmar and Gusliakov, separated by a distance of roughly 1.5km. The deposits are typical syngenetic VMS deposits, with distinct metal zonation and near-surface weathering profiles. The deposits were initially explored in the 1970s. A drill program to confirm the Mineral Resource and to perform metallurgical testing of the ores was completed in 2018 and quality assurance/quality control results are still pending. Due to the historical nature of the drilling, all Mineral Resources are currently classified as Inferred.

Zhairemsky: The various iron, manganese, barite and polymetallic deposits of the Zhairemsky area, central Kazakhstan were discovered by geological and geophysical prospecting between the 1930s and 1960s. Between 1978 and 1995, some 22 million tonnes of low-grade zinc-lead ore including barite-dominated mineralisation were mined. As of 1996, focus was set on manganese and iron ore production. The Zhairemsky deposits were acquired by Kazzinc on the basis of their polymetallic value.

Mining at the Zapadny pit commenced in 2018, extracting 1.2 Mt at 3.0% Zn, 2.7% Pb and 34g/t Ag.

The mined material from the Ushkatyn pit during 2018 was 0.7 Mt at 5.7% Pb and 37g/t Ag.

Uzynzhal: The Uzynzhal deposit is located in central Kazhakstan, in the same belt as the Zhareimsky deposits. It has been identified as a Sedex. Pb-Zn ores shows close spatial correlations with barite and manganese ores. The deposit is made up of an oxide cap, containining mainly Pb-oxide ores, while the sulfide portion of the deposit contains both Zn and Pb sulfides.

Novo-Leninogorskoye: The Novo-Leninogorskoye deposit is part of the Ridder-Sokolny group of VMS polymetallic deposits. Novo-Leninogorskoye was discovered in 1981 and was explored between 1981 and 1985. Two styles of mineralisation can be found at Novo-Leninogorskoye, barite-polymetallic and polymetallic with the mineralisation hosted by siltstones and quartzites.

Vasilkovskoye: It is a gold deposit of epigenetic (stockwork) type and beresite subtype of deposits hosting ores of gold-quartz formation.

Ore Reserves were estimated based upon an updated Resource interpretation and interpolation parameters; the Reserve was constrained by a new pit design, which is fully encompassed in the Resource pit shell. The mined material from Vasilkovskoye during 2018 was 9.1Mt at 2.1g/t Au.

Competent person

AC = Aline Côté, Head of Mining Technical Services, Glencore Zinc, (OGQ).

Metals and Minerals Zinc

Australia Mineral Resources (Mount Isa, McArthur River)

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources 31.12.18	Measured Mineral Resources 31.12.17	Indicated Mineral Resources 31.12.18	Indicated Mineral Resources 31.12.17	Measured and Indicated Resources 31.12.18	Measured and Indicated Resources 31.12.17	Inferred Mineral Resources 31.12.18	Inferred Mineral Resources 31.12.17	Competent Person
Mount Isa	100%											
Black Star		OC	(Mt)	4.8	7.9	3.1	1.9	7.9	10.0	7.3	0.80	AC
Open Cut			Zinc (%)	5.4	5.2	3.7	3.5	4.7	4.9	2	5.0	
			Lead (%)	5.2	4.7	3.2	2.7	4.4	4.3	1	4.0	
			Silver (g/t)	89	81	53	46	74	75	19	70	
Black Star		UG	(Mt)	13.6	–	52	–	66	–	92	–	AC
underground			Zinc (%)	5.7	–	5.6	–	5.6	–	5	–	
			Lead (%)	3.2	–	2.6	–	2.7	–	3	–	
			Silver (g/t)	62	–	46	–	49	–	62	–	
Mount Isa Open Pit		OC	(Mt)	27.5	45.3	80	191	107	236	40.3	120	AC
			Zinc (%)	4.0	4.1	4.1	3.6	3.8	3.7	4	3	
			Lead (%)	4.7	4.0	3.5	2.7	3.8	2.9	3	2	
			Silver (g/t)	97	81	73	57	79	62	62	50	
George Fisher	100%											
South (P49) Orebodies		UG	(Mt)	24.3	24.0	31.4	30.2	56	54	27	25	NS
			Zinc (%)	8.3	8.4	8.3	8.1	8.3	8.0	8	8	
			Lead (%)	5.2	5.2	4.8	4.8	5.0	5.0	4	4	
			Silver (g/t)	113	112	101	100	106	105	87	86	
North (L72) Orebodies		UG	(Mt)	32.8	38.7	135	126	168	165	53	43	NS
			Zinc (%)	9.3	9.2	8.8	8.8	8.9	8.9	9	9	
			Lead (%)	3.7	3.5	3.4	3.5	3.5	3.5	4	4	
			Silver (g/t)	63	60	53	55	55	56	57	55	
Handlebar Hill		OC	(Mt)	1.6	1.6	3.6	3.6	5.2	5.2	0.8	0.8	AC
Open Cut (primary)			Zinc (%)	7.8	7.8	6.1	6.1	6.6	6.6	5	5	
			Lead (%)	2.6	2.6	2.0	2.0	2.2	2.2	2	2	
			Silver (g/t)	41	41	35	35	37	37	30	30	
Handlebar Hill		OC	(Mt)	0.5	0.5	0.1	0.1	0.6	0.6	–	–	AC
Open Cut (oxide)			Zinc (%)	0.4	0.4	0.4	0.4	0.4	0.4	–	–	
			Lead (%)	8.5	8.5	4.1	4.1	7.8	7.8	–	–	
			Silver (g/t)	89	89	65	65	85	85	–	–	
Lady Loretta	100%	UG	(Mt)	4.6	5.3	3.7	3.9	8.3	9.2	–	0.3	NS
			Zinc (%)	16.3	16.3	15.1	14	15.7	15	–	11	
			Lead (%)	6.3	6.4	5.0	4.6	5.7	5.6	–	5	
			Silver (g/t)	96	104	87	86	92	96	–	90	
Total Mount Isa			**(Mt)**	**110**	**123**	**308**	**358**	**419**	**480**	**220**	**190**	
			Zinc (%)	**7.4**	**6.9**	**7.0**	**6.0**	**7.0**	**6.2**	**6**	**5**	
			Lead (%)	**4.4**	**4.2**	**3.4**	**3.2**	**3.7**	**3.4**	**3**	**3**	
			Silver (g/t)	**85**	**81**	**62**	**60**	**67**	**66**	**65**	**55**	
McArthur River	100%											
Open Cut		OC	(Mt)	108	121	56	57	164	180	–	–	KM
			Zinc (%)	9.7	9.9	9.5	8.1	9.6	9.4	–	–	
			Lead (%)	4.2	4.7	5.0	3.8	4.5	4.4	–	–	
			Silver (g/t)	42	47	54	40	46	45	–	–	
Woyzbun South Zone		UG	(Mt)	–	–	8.3	8.3	8.3	8.3		–	KM
			Zinc (%)	–	–	14	14	14	14	–	–	
			Lead (%)	–	–	5.6	5.6	5.6	5.6	–	–	
			Silver (g/t)	–	–	58	58	58	58	–	–	
Total McArthur River			**(Mt)**	**108**	**121**	**64**	**65**	**172**	**188**	–	–	
			Zinc (%)	**9.7**	**9.9**	**10.1**	**8.8**	**9.8**	**9.6**	–	–	
			Lead (%)	**4.2**	**4.6**	**5.1**	**4.0**	**4.6**	**4.5**	–	–	
			Silver (g/t)	**42**	**47**	**55**	**42**	**47**	**46**	–	–	
Total Australia			**(Mt)**	**217**	**244**	**373**	**423**	**591**	**668**	**202**	**190**	
			Zinc (%)	**8.5**	**8.4**	**7.5**	**6.4**	**7.8**	**7.2**	**6**	**5**	
			Lead (%)	**4.3**	**4.4**	**3.7**	**3.3**	**3.9**	**3.7**	**3**	**3**	
			Silver (g/t)	**65**	**64**	**61**	**57**	**62**	**60**	**65**	**55**	

Australia Ore Reserves (Mount Isa, McArthur River)

Name of operation	Attributable interest	Mining method	Commodity	Proved Ore Reserves 31.12.18	Proved Ore Reserves 31.12.17	Probable Ore Reserves 31.12.18	Probable Ore Reserves 31.12.17	Total Ore Reserves 31.12.18	Total Ore Reserves 31.12.17	Competent Person
George Fisher	100%									
South (P49) Orebodies		UG	Ore (Mt)	5.3	7.2	11.4	9.9	16.7	17.2	AC, JT
			Zinc (%)	6.5	6.8	6.1	5.7	6.2	6.2	
			Lead (%)	4.6	4.5	4.3	4.2	4.4	4.3	
			Silver (g/t)	103	100	97	95	99	97	
North (L72) Orebodies		UG	Ore (Mt)	11.2	13.4	61	45	72	58	AC, JT
			Zinc (%)	7.2	7.8	6.9	7.0	7.0	7.5	
			Lead (%)	3.3	3.5	3.1	3.0	3.1	3.4	
			Silver (g/t)	60	61	51	56	52	57	
Handlebar Hill Open Cut		OC	Ore (Mt)	0.5	0.5	–	–	0.5	0.5	AC
(oxide)			Zinc (%)	0.4	0.4	–	–	0.4	0.4	
			Lead (%)	8.5	8.5	–	–	8.5	8.5	
			Silver (g/t)	89	89	–	–	89	89	
Lady Loretta	100%	UG	Ore (Mt)	4.7	5.2	2.7	3.3	7.4	8.5	AC, JT
			Zinc (%)	12.6	14.5	12.1	11.0	12.5	13.1	
			Lead (%)	5.2	5.9	3.8	3.8	4.7	5.1	
			Silver (g/t)	79	97	71	70	76	87	
Total Mount Isa			**(Mt)**	**22**	**26.3**	**75**	**58**	**97**	**84**	
			Zinc (%)	**8.1**	**8.7**	**7.0**	**7.0**	**7.2**	**7.8**	
			Lead (%)	**4.1**	**4.3**	**3.3**	**3.2**	**3.5**	**3.8**	
			Silver (g/t)	**75**	**79**	**60**	**63**	**62**	**68**	
McArthur River	**100%**	**OC**	**(Mt)**	**73**	**70**	**35**	**44**	**108**	**114**	**DH**
			Zinc (%)	**9.4**	**10.6**	**8.1**	**7.4**	**9.0**	**9.3**	
			Lead (%)	**4.3**	**5.0**	**4.3**	**3.6**	**4.3**	**4.4**	
			Silver (g/t)	**43**	**50**	**46**	**37**	**44**	**45**	
Total Australia			**(Mt)**	**95**	**96**	**110**	**102**	**205**	**198**	
			Zinc (%)	**9.1**	**10.1**	**7.3**	**7.2**	**8.2**	**8.6**	
			Lead (%)	**4.3**	**4.8**	**3.6**	**3.4**	**3.9**	**4.1**	
			Silver (g/t)	**50**	**58**	**55**	**52**	**53**	**55**	

Notes

Mount Isa

Black Star Open Cut ("BSOC"): Lead-zinc-silver mineralisation occurs in galena and sphalerite-rich bedding parallel horizons in dolomitic and variably carbonaceous pyritic shales and siltstones.

The open cut was moved to a care and maintenance phase during the last quarter of 2016 after mining out the existing Reserves.

The resource mineralisation occurs inside a designed Stage. Stage 7 pit is based on a pit optimisation utilising Measured and Indicated Resources, all of which have been re-evaluated using updated metallurgical knowledge. Interpretation and interpolation was made utilising the Leapfrog and Leading Edge software. The interpolation method was ordinary kriging. As a result, some resources were reclassified as inferred mineral resources. Overall mineral resources increased year over year.

Black Star Underground ("BSUG"): is the continuation of the same lead-zinc-silver mineralisation in BSOC, which occurs in galena and sphalerite-rich bedding parallel horizons in dolomitic and variably carbonaceous pyritic shales and siltstones. This resource was previously included in the Mount Isa Open Pit disclosures, but separated now as this section was remodelled in 2018.

Mount Isa Open Pit ("MIOP"): Lead-zinc-silver mineralisation occurs in galena and sphalerite-rich bedding parallel horizons in dolomitic and variably carbonaceous pyritic shales and siltstones.

Approximately 85% of the lead-zinc-silver resource is primary sulphide; the remainder being considered as transitional (mixed primary sulphide and secondary oxide/carbonate) mineralisation.

Pit optimisation was conducted using Measured, Indicated and Inferred Mineral Resources, and a pit shell was generated to constrain the Mineral Resource.

The copper resource in MIOP has not been included here; it is reported separately in the Copper section of this report.

BSUG has been reported separately in 2018, as noted above. Aggregate mineral resources for MIOP and BSUG are 52Mt lower year over year, but at higher zinc/lead grades in each category of Mineral Resources, due to remodelling, new metallurgical insights and application of broader sterilisation shapes around historical openings.

BSOC, BSUG and the Isa Open Pit are all located on Mining Lease ML8058 which expires on 30 November 2036.

George Fisher Mine

North (L72) & South (P49) Orebodies: Lead-zinc-silver mineralisation occurs in galena and sphalerite-rich bedding parallel horizons in dolomitic and variably carbonaceous pyritic shales and siltstones.

Orebody and structural interpretation, modelling and classification of the Mineral Resource was completed on the

basis of additional geological information and improved systems.

Changes to the Mineral Resources are due to geological modelling and the addition of new drilling information.

Mine production for the period January 2018 to December 2018 totalled 2.9Mt at 7.3% Zn, 3.9% Pb and 68g/t Ag.

The mine is located on Mining Lease ML8058 and the lease expires on 30 November 2036.

Reserves were prepared by JT and reviewed and audited by AC.

Handlebar Hill Open Cut: Lead-zinc-silver mineralisation occurs in galena and sphalerite-rich bedding parallel horizons in dolomitic and variably carbonaceous pyritic shales and siltstones.

The Handlebar Hill Open Cut resource is up dip of and additional to the George Fisher South resource.

Material from the oxidised portion of the mineralisation has been reported as a Mineral Resource.

No depletion has occurred through mining during 2018.

The Handlebar Hill Open Cut is located on Mining Lease ML8058 which expires on 30 November 2036. The mine was placed in care and maintenance in July 2014.

Lady Loretta

Lead-zinc-silver mineralisation occurs in a galena and sphalerite rich massive sulphide lens located in carbonaceous pyritic shales and siltstones. The deposit consists of a tight syncline dislocated by a number of major faults. The deeper and high grade portion of the deposit reaches 500m below the surface.

Mine production at Lady Loretta restarted in 2018. By December 2018 its mined production was 8Mt at 15.5% Zn, 6.9% Pb and 110g/t Ag.

The Mining Lease (ML5568) is current until 31 January 2026.

Reserves were prepared by JT and reviewed and audited by AC.

McArthur River Mine

Zinc-lead-silver mineralisation occurs predominantly as ultra-fine bedded parallel sphalerite and galena rich bands hosted by dolomitic and carbonaceous pyritic siltstones, graded beds and chaotic debris flow breccia.

Mineral Resources and Ore Reserves are based on the approved mine plan.

All relevant Modifying Factors for the conversion of Mineral Resources to Ore Reserves have been considered, with confidence levels in these factors reflected in the classification categories. There are no known issues that could materially affect the estimates.

Mine production for the period January 2018 to December 2018 totalled 4.2Mt at 9.6% Zn, 4.3% Pb and 45g/t Ag. Changes beyond depletion were primarily due to revised cut-off calculations. The Mineral Resources were reduced by 7.6Mt due to the updated resource shell, required following a revised cut-off calculation.

Mineral Resources and Ore Reserves are located within leases that are valid to 2043, with the revised mine plan ending in 2040.

Competent persons

AC = Aline Côté, Head of Mining Technical Services, Glencore Zinc, (OGQ).

JT = Jody Todd, Manager – Technical Services, Zinc Mining Queensland, (AusIMM).

KM = Kristian Masterman, Mining Technical Services Superintendent, Glencore Zinc, (AusIMM).

DH = Drew Herbert, Mining Consultant, The Minserve Group Pty Ltd, (AusIMM).

NS = Nicholas Spanswick, Mineral Resources Superintendent, Glencore Zinc, (AIG).

Metals and Minerals Zinc

North America Mineral Resources (Zinc projects: Kidd Creek, Matagami, PD1, Errington, Vermilion, Hackett River, Bell, Granisle)

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources 31.12.18	Measured Mineral Resources 31.12.17	Indicated Mineral Resources 31.12.18	Indicated Mineral Resources 31.12.17	Measured and Indicated Resources 31.12.18	Measured and Indicated Resources 31.12.17	Inferred Mineral Resources 31.12.18	Inferred Mineral Resources 31.12.17	Competent Person
Kidd Creek	100%	UG	(Mt)	9.5	10.1	0.9	1.0	10	11	3.5	3.5	BD
			Zinc (%)	4.1	4.4	5.0	5.5	4.2	4.5	7	7	
			Copper (%)	1.9	1.9	1.6	1.7	1.9	1.9	2	2	
			Silver (g/t)	48.0	50	44.0	42	48	50	60	60	
Matagami	100%											
Bracemac-McLeod		UG	(Mt)	1.5	1.3	2.2	3.6	3.7	4.9	–	–	JD
			Zinc (%)	5.5	5.3	7.3	6.2	6.6	6.0	–	–	
			Copper (%)	0.9	0.9	1.0	1.1	1.0	1.0	–	–	
			Silver (g/t)	24	18	31	29	28	26	–	–	
			Gold (g/t)	0.5	0.3	0.6	0.7	0.6	0.6	–	–	
Caber	100%	UG	(Mt)	0.8	0.7	0.7	0.8	1.5	1.5	0.02	0.02	AC
			Zinc (%)	6.1	5.9	5.4	4.6	5.2	5.2	8	8	
			Copper (%)	1.1	1.2	1.1	1.1	1.1	1.1	1	1	
			Silver (g/t)	10	10	9	10	10	10	6	6	
			Gold (g/t)	0.3	0.2	0.3	0.3	0.3	0.3	0.1	0.1	
Caber Nord	100%	UG	(Mt)	–	–	–	–	–	–	6	–	AC
			Zinc (%)	–	–	–	–	–	–	3	–	
			Copper (%)	–	–	–	–	–	–	1	–	
			Silver (g/t)	–	–	–	–	–	–	11	–	
			Gold (g/t)	–	–	–	–	–	–	0.1	–	
PD-1	100%	OC/UG	(Mt)	0.6	0.6	1.0	1.0	1.6	1.6	–	–	GR
			Zinc (%)	4.2	4.2	5.0	5.0	4.7	4.7	–	–	
			Copper (%)	0.8	0.8	1.3	1.3	1.1	1.1	–	–	
			Silver (g/t)	20	20	20	20	20	20	–	–	
			Gold (g/t)	0.1	0.1	–	–	–	–	–	–	
Errington	100%	UG	(Mt)	6.7	6.7	2.3	2.3	9.0	9.0	–	–	AC
			Zinc (%)	3.9	3.9	4.3	4.3	4	4	–	–	
			Lead (%)	1.1	1.1	1.3	1.3	1.2	1.2	–	–	
			Copper (%)	1.2	1.2	1.1	1.1	1.1	1.1	–	–	
			Silver (g/t)	52	52.0	55	55	53	53	–	–	
			Gold (g/t)	0.8	0.8	0.8	0.8	0.8	0.8	–	–	
Vermilion	100%	UG	(Mt)	2.8	2.8	0.4	0.4	3.2	3.2	–	–	AC
			Zinc (%)	4.2	4.2	5.3	5.3	4.4	4.4	–	–	
			Lead (%)	1.2	1.2	1.3	1.3	1.2	1.2	–	–	
			Copper (%)	1.3	1.3	1.1	1.1	1.3	1.3	–	–	
			Silver (g/t)	53	53	56	56	53	53	–	–	
			Gold (g/t)	0.9	0.9	1.1	1.1	0.9	0.9	–	–	
Hackett River	100%	OC/UG	(Mt)	–	–	27.1	27.1	27.1	27.1	60	60	AC
			Zinc (%)	–	–	4.5	4.5	4.5	4.5	4	4	
			Lead (%)	–	–	0.6	0.6	0.6	0.6	1	1	
			Copper (%)	–	–	0.5	0.5	0.5	0.5	0.4	0.4	
			Silver (g/t)	–	–	130	130	130	130	150	150	
			Gold (g/t)	–	–	0.3	0.3	0.3	0.3	0.2	0.2	
Total Zinc North America			**(Mt)**	**21.7**	**22.1**	**34**	**36**	**55**	**58**	**70**	**64**	
			Zinc (%)	**4.2**	**4.3**	**4.8**	**4.7**	**4.5**	**4.6**	**4**	**4**	
			Lead (%)	**0.5**	**0.5**	**0.5**	**0.5**	**0.7**	**0.5**	**1**	**1**	
			Copper (%)	**1.5**	**1.5**	**0.7**	**0.7**	**1.0**	**1.0**	**1**	**1**	
			Silver (g/t)	**46**	**47**	**112**	**106**	**87**	**84**	**133**	**145**	
			Gold (g/t)	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.2**	**0.2**	

North America Mineral Resources (Copper projects: Bell, Granisle)

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources 31.12.18	Measured Mineral Resources 31.12.17	Indicated Mineral Resources 31.12.18	Indicated Mineral Resources 31.12.17	Measured and Indicated Resources 31.12.18	Measured and Indicated Resources 31.12.17	Inferred Mineral Resources 31.12.18	Inferred Mineral Resources 31.12.17	Competent Person
Bell	100%	OC	(Mt)	57	57	200	200	257	257	100	100	BD
			Copper (%)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
			Gold (g/t)	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	
Granisle	100%	OC	(Mt)	18	18	55	55	73	73	20	20	BD
			Copper (%)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
			Gold (g/t)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Total Copper North America			**(Mt)**	**75**	**75**	**255**	**255**	**330**	**330**	**120**	**120**	
			Copper (%)	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	
			Gold (g/t)	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**	

North America Ore Reserves (Kidd Creek, Matagami)

Name of operation	Attributable interest	Mining method	Commodity	Proved Ore Reserves 31.12.18	Proved Ore Reserves 31.12.17	Probable Ore Reserves 31.12.18	Probable Ore Reserves 31.12.17	Total Ore Reserves 31.12.18	Total Ore Reserves 31.12.17	Competent Person
Kidd Creek	100%	UG	Ore (Mt)	4.8	5.7	1.2	1.3	6.0	7.0	AM
			Zinc (%)	3.6	3.8	5.5	5.7	4.0	4.2	
			Copper (%)	2.0	2.0	1.8	1.8	2.0	1.9	
			Silver (g/t)	46	49	40	42	45	48	
Matagami	100%									
Bracemac-McLeod		UG	Ore (Mt)	0.9	0.7	1.8	2.8	2.8	3.4	AC
			Zinc (%)	5.5	6.3	6.5	6.8	6.1	6.7	
			Copper (%)	0.8	0.8	0.9	1.1	0.9	1.1	
			Silver (g/t)	25	16	27	30	26	28	
			Gold (g/t)	0.5	0.4	0.6	0.7	0.6	0.6	
Total North America			**Ore (Mt)**	**5.8**	**6.3**	**3.0**	**4.1**	**9**	**10**	
			Zinc (%)	**3.93**	**4.1**	**6.1**	**6.4**	**4.7**	**5.0**	
			Copper (%)	**1.79**	**1.8**	**1.3**	**1.3**	**1.6**	**1.6**	
			Silver (g/t)	**42**	**46**	**32**	**34**	**39**	**41**	
			Gold (g/t)	**0.09**	**0.04**	**0.4**	**0.5**	**0.2**	**0.2**	

Notes

Kidd Creek: Kidd Creek is a VMS Cu-Zn-Ag deposit. Mineralisation occurs within a rhyolitic volcanic/volcaniclastic sequence as massive sulphide lenses of dominantly pyrite-pyrrhotite-sphalerite-galena-rich ores that are underlain by copper (chalcopyrite) stringer zones.

Ore Reserves are based on the approved mining plan to 9600ft depth.

Mineral Resources and Ore Reserves changes are the result of mining drawdown, with some adjustments due to updated mine design, cost reductions, and commodity pricing changes.

January to December 2018 estimated production totalled 2.0Mt at 3.9% Zn, 1.7% Cu and 41g/t Ag.

The majority of Ore Reserve in the Probable category reflects geotechnical and economic uncertainty during the latter years of the mine plan, rather than geological uncertainty.

Mine life is anticipated to be 3.5 years (Mid-2022). There are no known land tenure issues that could affect the production plan.

Bracemac-McLeod: The Bracemac-McLeod deposits comprise a cluster of polymetallic VMS lenses similar to other deposits mined historically in the Matagami mining camp, except for their generally thinner and more complex morphology.

Since most of the shallower deposits are now mined out, the McLeod Deep lens, which lies between depths of 980m and 1,470m, now represents 90% of the total resource. An underground diamond drilling campaign started to delineate that lens to a 15m spacing should end mid-2019. The geological model and the resource block model for this deposit are updated on a regular basis, based on new information derived from ongoing underground diamond drilling and geological mapping.

Approximately 40% of the Deep lens is now classified as Measured Resource, the rest still being classified as Indicated Resource. The residual resource for the shallower Bracemac lenses (Main, KT and Upper) and McLeod A and B lenses are all classified as Measured Resource.

Mine production for year 2018 was 0.7Mt grading 5.3% Zn, 0.8% Cu, 18g/t Ag and 0.4g/ Au.

Mine life is anticipated to be 3.5 years (Mid-2022). There are no known land tenure issues that could affect the production plan.

PD–1: The PD1 deposit is a polymetallic VMS of the same age and derived from the same ore-forming hydrothermal system as the rest of the Matagami camp deposits. It is located 40km west of Glencore's Matagami concentrator and offices.

The PD1 deposit was discovered in 1974. A total of 50 historical drill holes were drilled between 1974 and 1984. In 2010, 25 additional holes were drilled in the upper portion of the deposit above 100m vertical depth, including 3 duplicate holes to validate the historical data. The deposit is located on a mining claim owned by Glencore Canada Corporation.

Caber and Caber Nord: The Caber deposits are polymetallic VMS's of the same age and derived from the same ore-

forming hydrothermal system as the rest of the Matagami camp deposits. They are located 35km west of Glencore's Matagami concentrator and offices.

The deposit is located on a mining claim owned by Glencore Canada Corporation. Drilling conducted in 2017-18 grew historical resources and increased confidence in the grade and tonnage of the mineralization.

Errington: The Errington deposit is a polymetallic massive sulphide located in the Sudbury Basin, Ontario. The 5 lenses that make up this deposit are hosted by sedimentary rocks of the Vermilion Formation at the contact of the Onaping and Onwatin formations. The deposits formed by replacement of carbonate mounds and carbonaceous tuffs fuelled by heat from the Sudbury Igneous Complex. Additional enrichment and concentration of metals was provided by deformation from the South Range shear zone.

Discovered in the 1920's, the Errington underground development began in 1924 and ended in 1928. A total of 129,713t of ore were produced from Errington.

The historical resource was confirmed and rendered compliant with a 50,000m drill programme in 2013.

Vermilion: The Vermilion deposit is a polymetallic massive sulphide located in the Sudbury Basin, Ontario. The 17 lenses that make up this deposit are hosted by sedimentary rocks of the Vermilion Formation at the contact of the Onaping and Onwatin formations. The deposits formed by replacement of carbonate mounds and carbonaceous tuffs fuelled by heat from the Sudbury Igneous Complex. Additional enrichment and concentration of metals was provided by deformation from the South Range shear zone.

Although discovered in the 1920's, the Vermilion underground development only started between 1952 and 1957. A total of 22,172t of ore were hoisted at Vermillion and stockpiled circa since 1958. The stockpile was shipped to Kidd Creek for processing in 1992.

The historical resource was confirmed and rendered compliant with a 10,000m drill programme in 2013. The resources have been interpolated by ID2.

Hackett River Project: The Hackett River project is located in Nunavut, Canada, approximately 480km northeast of Yellowknife and 105km south–southwest of the community of Bathurst Inlet, which is located on the Arctic Ocean.

The Hackett River deposits are situated within the Slave Structural Province, a predominantly Archaean granite-greenstone-sedimentary terrain that lies between Great Slave Lake and Coronation Gulf. The deposits are typical of VMS deposits. Sulphide mineralisation occurs as tabular semi-massive to massive lenses. Stringer sulphide minerals are developed beneath the lower massive lenses in stratiform to pipe-like configurations. Stratiform disseminated sulphides envelop the massive sulphide and stringer zones.

The four principal sulphide occurrences from west to east are the East Cleaver, Boot Lake, Main Zone, and Jo Zone deposits. These deposits were defined as economically viable mineable resources, following boundaries of open cut vs underground mining, through a Preliminary Economic Assessment prior to Glencore's acquisition (2010). A Pre-Feasibility study was carried out in 2013 to evaluate possible mining methods and boundaries between open cut and underground; for these reasons the Mineral Resources are only distinguished through their categories instead of exploitation method.

Following the exploration drilling campaign of 2013, which added 114 drill holes totalling 39,000m, we have undertaken the re-interpretation of an *in situ* resource using Zn equivalent values instead of considering a block dollar value. The resources have been interpolated by ID2.

Bell/Granisle: Bell and Granisle are porphyry copper-gold deposits located at Babine Lake. The Babine deposits are associated with calc-alkaline magmatic rocks. They were formed in the roots of Eocene volcanoes built upon continental crust. Erosion has removed most of the poorly consolidated volcanic piles, exposing the mineral deposits.

Recorded past production from the Bell mine from 1972 to 1992 totalled 77.2Mt averaging 0.47% Cu with an average waste to ore ratio of 0.95:1.

Past production for Granisle from 1966 to 1982 totalled 52.7Mt averaging 0.47% Cu with an average waste to ore ratio of 1.37.

Mineral Resources were not updated in 2018. A life of mine of 19 years has been estimated, at a processing rate of 50,000 tonnes per day.

There are no known land tenure issues and the mining leases are renewed yearly.

Competent persons

AC = Aline Côté, Head of Mining Technical Services, Glencore Zinc, (OGQ).

AM = Adrianus Moerman, Principal Mine Engineer, Glencore Zinc, (PEO).

BD = Benoit Drolet, Senior Resource Geologist, Glencore Zinc (APGO).

GR = Gilles Roy, Senior Resource Geologist, Glencore Zinc, (OGQ).

JD = Julie Drapeau, Chief Mine Geologist, Glencore Zinc (OGQ).

Volcan Mineral Resources (Yauli, Chungar, Alpamarca, Palma, Romina, La Tapada, Cerro de Pasco, Santa Barbara and Rondoni)

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources		Competent person
				31.12.18	31.12.17	31.12.18	31.12.17	31.12.18	31.12.17	31.12.18	31.12.17	
Yauli	23.3%		(Mt)	4.6	–	4.7	–	9.3	–	4.7	–	AC
Andaychagua		UG	Zinc (%)	4.2	–	4.0	–	4.1	–	4	–	
			Lead (%)	1.0	–	0.9	–	0.9	–	1	–	
			Silver (g/t)	117	–	121	–	119	–	132	–	
Carahuacra		UG	(Mt)	3.0	–	3.6	–	6.6	–	3.4	–	AC
			Zinc (%)	7.5	–	6.4	–	6.9	–	7	–	
			Lead (%)	0.6	–	0.8	–	0.7	–	1	–	
			Silver (g/t)	88	–	81	–	84	–	115	–	
San Cristobal		UG	(Mt)	17.5	–	15.7	–	33.2	–	13.1	–	AC
			Zinc (%)	7.0	–	5.9	–	6.5	–	5	–	
			Lead (%)	1.1	–	0.9	–	1.0	–	1	–	
			Silver (g/t)	127	–	123	–	125	–	92	–	
Ticlio		UG	(Mt)	3.9	–	4.0	–	7.9	–	4.8	–	AC
			Zinc (%)	4.6	–	2.9	–	3.7	–	2	–	
			Lead (%)	1.0	–	0.6	–	0.8	–	1	–	
			Silver (g/t)	37	–	31	–	34	–	30	–	
Chungar	23.3%		(Mt)	1.2	–	1.6	–	2.7	–	2.9	–	AC
Islay		UG	Zinc (%)	1.8	–	1.3	–	1.5	–	1	–	
			Lead (%)	0.9	–	0.6	–	0.7	–	1	–	
			Silver (g/t)	290	–	153	–	218	–	109	–	
Animon		UG	(Mt)	4.0	–	7.9	–	11.9	–	13.3	–	AC
			Zinc (%)	8.8	–	7.0	–	7.6	–	5	–	
			Lead (%)	2.6	–	2.2	–	2.3	–	2	–	
			Silver (g/t)	111	–	78	–	89	–	64	–	
Alpamarca	23.3%	OC	(Mt)	1.0	–	2.4	–	3.4	–	0.6	–	AC
			Zinc (%)	1.0	–	1.1	–	1.1	–	1	–	
			Lead (%)	0.7	–	0.9	–	0.8	–	1	–	
			Silver (g/t)	51	–	53	–	52	–	76	–	
Palma	23.3%	UG	(Mt)	–	–	9.6	–	9.6	–	4.9	–	AC
			Zinc (%)	–	–	5.0	–	5.0	–	6	–	
			Lead (%)	–	–	0.7	–	0.7	–	1	–	
			Silver (g/t)	–	–	22	–	22	–	21	–	
Romina	23.3%	UG	(Mt)	–	–	5.5	–	5.5	–	2.8	–	AC
			Zinc (%)	–	–	6.1	–	6.1	–	4	–	
			Lead (%)	–	–	2.9	–	2.9	–	2	–	
			Silver (g/t)	–	–	46	–	46	–	25	–	
La Tapada	23.3%	UG	(Mt)	–	–	–	–	–	–	7.7	–	AC
			Zinc (%)	–	–	–	–	–	–	3	–	
			Lead (%)	–	–	–	–	–	–	1	–	
			Silver (g/t)	–	–	–	–	–	–	38	–	
Cero de Pasco	23.3%		(Mt)	2.1	–	–	–	2.1	–	154	–	AC
			Zinc (%)	1.2	–	–	–	1.2	–	2.1	–	
			Lead (%)	0.6	–	–	–	0.6	–	1	–	
			Silver (g/t)	15	–	–	–	15	–	78	–	
Total Pb-Zn-Ag			**(Mt)**	**37**	–	**55**	–	**92**	–	**212**	–	
			Zinc (%)	**6.3**	–	**5.2**	–	**5.6**	–	**2.7**	–	
			Lead (%)	**1.2**	–	**1.2**	–	**1.2**	–	**0.9**	–	
			Silver (g/t)	**109**	–	**79**	–	**93**	–	**76**	–	

Metals and Minerals Zinc

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources		Competent person
				31.12.18	31.12.17	31.12.18	31.12.17	31.12.18	31.12.17	31.12.18	31.12.17	
Santa Barbara	23.3%	OC	(Mt)	–	–	–	–	–	–	140	–	AC
			Cu (%)	–	–	–	–	–	–	0.4	–	
			Gold (g/t)	–	–	–	–	–	–	0.2	–	
Rondoni	23.3%	OC	(Mt)	18.4	–	34.3	–	53	–	7.8	–	AC
			Cu (%)	0.5	–	0.5	–	0.5	–	0.5	–	
Total Cu			**(Mt)**	**18.4**	–	**34.3**	–	**53**	–	**148**	–	
			Gold (g/t)	–	–	–	–	–	–	**0.4**	–	
			Cu (%)	**0.5**	–	**0.5**	–	**0.5**	–	**0.2**	–	

Volcan Ore Reserves (Yauli, Chungar, Alpamarca, Cerro de Pasco)

Name of operation	Attributable interest	Mining method	Commodity	Proved Ore Reserves		Probable Ore Reserves		Total Ore Reserves		Competent Person
				31.12.18	31.12.17	31.12.18	31.12.17	31.12.18	31.12.17	
Yauli	23.3%	UG	Ore (Mt)	2.7	–	3.1	–	5.8	–	AC
Andaychagua			Zinc (%)	3.5	–	3.2	–	3.3	–	
			Lead (%)	0.9	–	0.7	–	0.8	–	
			Silver (g/t)	82	–	88	–	86	–	
Carahuacra		UG	Ore (Mt)	1.3	–	1.4	–	2.7	–	AC
			Zinc (%)	4.3	–	4.1	–	4.2	–	
			Lead (%)	0.4	–	0.5	–	0.4	–	
			Silver (g/t)	51	–	54	–	55	–	
San Cristobal		UG	Ore (Mt)	5.5	–	6.2	–	11.6	–	AC
			Zinc (%)	5.8	–	4.7	–	5.2	–	
			Lead (%)	0.7	–	0.9	–	0.8	–	
			Silver (g/t)	94	–	104	–	99	–	
Ticlio		UG	Ore (Mt)	0.9	–	0.5	–	1.5	–	AC
			Zinc (%)	4.3	–	4.2	–	4.3	–	
			Lead (%)	0.9	–	0.7	–	0.9	–	
			Silver (g/t)	28	–	24	–	27	–	
Chungar	23.3%	UG	Ore (Mt)	0.3	–	0.5	–	0.9	–	AC
Islay			Zinc (%)	0.9	–	1.5	–	1.3	–	
			Lead (%)	0.5	–	0.8	–	0.6	–	
			Silver (g/t)	177	–	175	–	176	–	
Animon		UG	Ore (Mt)	2.2	–	5.2	–	7.4	–	AC
			Zinc (%)	5.1	–	4.8	–	4.9	–	
			Lead (%)	1.5	–	1.6	–	1.4	–	
			Silver (g/t)	63	–	51	–	54	–	
Alpamarca		UG	Ore (Mt)	0.9	–	1.6	–	2.5	–	AC
			Zinc (%)	0.9	–	0.8	–	0.9	–	
			Lead (%)	0.7	–	0.6	–	0.7	–	
			Silver (g/t)	48	–	37	–	41	–	
Cerro de Pasco		UG	Ore (Mt)	2.1	–	–	–	2.1	–	AC
Sulphide stockpile			Zinc (%)	1.2	–	–	–	1.2	–	
			Lead (%)	0.6	–	–	–	0.6	–	
			Silver (g/t)	15	–	–	–	15	–	
Total Volcan			**(Mt)**	**15.8**	–	**18.5**	–	**34.3**	–	
			Zinc (%)	**4.1**	–	**4.0**	–	**4.0**	–	
			Lead (%)	**0.8**	–	**1.0**	–	**0.9**	–	
			Silver (g/t)	**74**	–	**76**	–	**73**	–	

Glencore holds 55.0% of the total class A common shares (63.0% of the class A common shares excluding treasury shares) and has an economic interest in Volcan of 23.3% (including the class B common shares and excluding treasury shares)

Notes

Yauli: The Yauli "dome" is located 100 km East of Lima, in Peru. The southern portion of the dome is where Andaychagua, Carahuacra, San Cristobal and Ticlio are located, and is made up of mantos and vein types deposits. The mantos type are hosted by the Pucara limestone, while the veins are steeply dipping and cross-cut rocks of the Mitu and Excelsior groups, as well as the Chumpe and San Cristobal intrusions. Various software was used for mineral resource modelling and interpolation: Leapfrog, Leapfrog Edge, GEMS and Datamine. The main mining methods used are a broadly equal mix of sub-level stoping and cut-and-fill.

In 2018, Yauli complex production was split between the four operations:

- Andaychagua: 854kt at 4.3% Zn, 1.0% Pb, and 133 g/t Ag,
- Carahuacra: 857kt at 4.9% Zn, 0.3% Pb and 62 g/t Ag,
- San Cristobal: 1.1Mt at 5.4% Zn, 0.5% Pb and 83 g/t Ag,
- Ticlio: 350kt at 5.2% Zn, 1.3% Pb, 0.3% Cu and 48 g/t Ag.

Chungar: Located in the Huaron mining district, it encompasses the Islay and Animon mines. The mineralization in Islay comprises a breccia-type fissure fill, mainly with silver mineralization, with subordinated lead and zinc, Animon is a hydrothermal polymetallic deposit (hosting silver, lead, zinc, and copper) consisting of mineralized structures probably related to Miocene aged monzonite dykes principally within, but not confined to the Huaron anticline. Various software was used for mineral resource modelling and interpolation: Leapfrog, Leapfrog Edge, GEMS and Datamine. Animon is exploited using a combination of sub-level stoping and cut-and-fill, while Islay focuses mainly on cut-and-fill.

In 2018, Chungar production was split between the two operations:

- Animon: 1.4 Mt at 5.6% Zn, 1.3% Pb and 69 g/t Ag,
- Islay: 302kt at 1.2% Zn, 0.7% Pb and 178 g/t Ag

Alpamarca: The Alpamarca deposit is a structurally controlled vein-type deposit located in the Pacaros district of the province of Huarai.

In 2018, Alpamarca produced 948kt at 1.1% Zn, 0.7% Pb and 54 g/t Ag

Palma: an advanced exploration zinc, lead and silver project with some presence of copper. The deposit is a polymetallic sub-seafloor replacement body whose mineralization presents itself in the volcano-sedimentary rocks of the Casma Group, which also hosts important deposits such as Perubar, Cerro Lindo and Colquisiri. The project is located in the Huarochiri province of Lima.

Romina: an advanced exploration project with a polymetallic mineralization that includes zinc, lead, silver, and some presence of copper. The deposit shows outcropings in the form of replacement bodies and sills rich in lead and zinc. It is located 15 km west of the Alpamarca mine in the Pacaros district of the province of Huaral in the region of Lima.

La Tapada: a project at the initial exploration stage. It is part of Volcan´s Yauli operating unit located within the geological formation known as the Yauli Dome. This formation consists of folded structures that align themselves over intrusive stock related to zinc and lead bodies and veins containing silver.

Cerro de Pasco: Due to the complex nature of the geological understanding and financial requirements of the remaining Cerro de Pasco deposit, all mineral resources other than the stockpile were downgraded to Inferred (versus Volcan's previously published 2017 Annual Report). These mineral resources are presented unconstrained by any pit shell. Ore reserves reflect only surveyed stockpiles which are intended to be processed in 2019.

Santa Bárbara and Rondoni: The geological setting of the Santa Bárbara and Rondoni projects is characteristic of an Andean Cu-porphyry deposit with mineralization dominantly occurring in chalcopyrite-bearing veinlets with intermediate argillic and potassic alteration. In their upper portions the deposits exhibit a lithocap of intense advanced argillic alteration typical to Cu-porphyries. Mineralization occurs as dissemination in the matrix and in systems of veinlets, in lesser quantities.

Competent Person

AC = Aline Côté, Head of Mining Technical Services, Glencore Zinc, (OGQ).

Metals and Minerals Zinc

Other Zinc Mineral Resources (Los Quenuales, Illapa, Sinchi Wayra, Aguilar, Pallas Green)

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources 31.12.18	Measured Mineral Resources 31.12.17	Indicated Mineral Resources 31.12.18	Indicated Mineral Resources 31.12.17	Measured and Indicated Resources 31.12.18	Measured and Indicated Resources 31.12.17	Inferred Mineral Resources 31.12.18	Inferred Mineral Resources 31.12.17	Competent Person
Los Quenuales	97.6%											
Iscaycruz		UG/OC	(Mt)	1.5	1.5	2.8	2.9	4.2	4.4	2.2	2.2	AC
			Zinc (%)	6.0	6.0	5.5	5.5	5.7	5.7	6	6	
			Lead (%)	0.4	0.4	0.6	0.6	0.5	0.5	1	1	
			Copper (%)	0.5	0.5	0.5	0.5	0.5	0.5	0.3	0.3	
			Silver (g/t)	28	22	33	31	32	28	30	42	
Yauliyacu		UG	(Mt)	7.3	8.5	12.0	10.5	19.4	19.0	11.9	4.1	AC
			Zinc (%)	3.2	3.5	3.3	3.4	3.2	3.4	4	2.2	
			Lead (%)	1.1	1.6	1.3	1.8	1.2	1.7	2	2	
			Copper (%)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	
			Silver (g/t)	118	182	163	226	146	206	299	285	
Contonga		UG	(Mt)	2.0	1.9	3.3	2.3	5.3	4.2	4.6	2.3	AC
			Zinc (%)	3.6	3.7	3.0	3.9	3.3	3.8	3	4	
			Lead (%)	0.9	0.5	0.7	1.1	0.7	0.8	1	1	
			Copper (%)	0.7	1.1	0.8	0.8	0.8	0.9	1	1	
			Silver (g/t)	55	51	55	70	55	62	55	70	
Illapa	45%											
Bolivar		UG	(Mt)	1.5	1.2	1.3	1.1	2.8	2.3	6.0	6.1	AC
			Zinc (%)	14.0	14.8	13.7	13.1	13.9	13.9	9	10	
			Lead (%)	1.6	1.7	1.3	1.4	1.5	1.6	1	1	
			Silver (g/t)	343	374	336	325	340	350	338	266	
Porco		UG	(Mt)	1.2	0.8	0.7	1.0	1.9	1.8	2.2	3.5	AC
			Zinc (%)	11.3	12.8	10.4	10.9	10.8	11.8	11	10	
			Lead (%)	0.7	0.9	0.7	0.8	0.9	0.9	1	1	
			Silver (g/t)	106	117	104	102	104	108	102	94	
Sinchi Wayra	100%											
Caballo Blanco		UG	(Mt)	0.9	0.6	0.7	0.7	1.6	1.3	2.0	2.0	AC
			Zinc (%)	13.2	13.6	13.0	12.9	13.1	13.2	12	13	
			Lead (%)	3.2	3.6	2.6	4.1	2.9	3.9	2	4	
			Silver (g/t)	301	323	252	378	279	352	219	313	
Aguilar	100%											
Aguilar Pit		OC	(Mt)	0.5	0.5	0.4	0.4	0.8	0.8	0.03	0.03	AC
			Zinc (%)	2.8	2.8	2.3	2.3	2.6	2.6	2	2	
			Lead (%)	2.3	2.3	2.4	2.4	2.3	2.3	3	3	
			Silver (g/t)	59	59	65	65	62	62	65	65	
Aguilar		UG	(Mt)	1.0	1.3	0.7	0.8	1.7	2.1	0.3	0.4	AC
			Zinc (%)	8.5	8.0	8.6	8.3	8.6	8.1	8	9	
			Lead (%)	9.5	8.8	7.3	7.5	8.6	8.3	6	8	
			Silver (g/t)	184	185	142	136	167	166	99	128	
Pallas Green	100%		(Mt)	–	–	–	–	–	–	45.1	44.2	AH
Tobermalug Zone			Zinc (%)	–	–	–	–	–	–	7	7	
			Lead (%)	–	–	–	–	–	–	1	1	
Total Other Zinc			**(Mt)**	**15.9**	**16.3**	**22**	**20**	**38**	**36**	**73**	**64**	
			Zinc (%)	**6.0**	**5.8**	**4.8**	**5.2**	**5.3**	**5.5**	**7**	**7**	
			Lead (%)	**1.7**	**2.0**	**1.4**	**1.8**	**1.5**	**1.9**	**1**	**1**	
			Copper (%)	**0.3**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.1**	**0.1**	
			Silver (g/t)	**134**	**165**	**138**	**177**	**137**	**172**	**89**	**62**	

Metals and Minerals Zinc

Other Zinc Ore Reserves (Los Quenuales, Illapa, Sinchi Wayra, Aguilar)

Name of operation	Attributable interest	Mining method	Commodity	Proved Ore Reserves 31.12.18	Proved Ore Reserves 31.12.17	Probable Ore Reserves 31.12.18	Probable Ore Reserves 31.12.17	Total Ore Reserves 31.12.18	Total Ore Reserves 31.12.17	Competent Person
Los Quenuales	97.6%									
Iscaycruz pit		OC	Ore (Mt)	0.7	0.8	1.7	1.7	2.4	2.5	AC
			Zinc (%)	4.9	4.8	5.1	5.1	5.1	5.0	
			Lead (%)	0.6	0.6	0.7	0.71	0.7	0.7	
			Copper (%)	0.3	0.3	0.2	0.18	0.2	0.2	
			Silver (g/t)	38	37	45	47	43	44	
Iscaycruz		UG	Ore (Mt)	–	–	0.5	0.5	0.5	0.5	AC
			Zinc (%)	–	–	6.0	6.0	6.0	6.0	
			Copper (%)	–	–	0.9	0.9	0.9	0.9	
			Silver (g/t)	–	–	20	20	20	20	
Yauliyacu		UG	Ore (Mt)	2.5	1.8	6.1	4.9	8.6	6.7	AC
			Zinc (%)	2.5	2.5	1.9	2.3	2.4	2.4	
			Lead (%)	0.7	0.9	0.8	1.1	0.8	1.0	
			Copper (%)	0.3	0.3	0.3	0.3	0.3	0.3	
			Silver (g/t)	87	122	109	146	103	140	
Contonga		UG	Ore (Mt)	0.2	0.4	0.8	1.0	1.0	1.4	AC
			Zinc (%)	2.7	2.9	2.8	3.7	2.8	3.5	
			Lead (%)	0.7	0.3	0.4	1.0	0.5	0.8	
			Copper (%)	0.7	1.0	1.2	0.7	1.1	0.8	
			Silver (g/t)	44	33	41	60	42	53	
Illapa	45%									
Bolivar		UG	Ore (Mt)	0.7	0.5	0.8	0.5	1.4	1.0	AC
			Zinc (%)	10.6	10	10.9	9.2	10.7	10	
			Lead (%)	1.2	1.2	1.0	1.1	1.1	1.1	
			Silver (g/t)	259	308	261	264	260	285	
Porco		UG	Ore (Mt)	0.4	0.3	0.2	0.5	0.6	0.8	AC
			Zinc (%)	9.5	10.5	9.7	8.0	9.5	8.9	
			Lead (%)	0.5	0.6	0.5	0.4	0.5	0.5	
			Silver (g/t)	90	101	102	87	94	92	
Sinchi Wayra	100%									
Caballo Blanco		UG	Ore (Mt)	0.8	0.7	0.7	1.0	1.4	1.7	AC
			Zinc (%)	6.8	7.7	8.0	7.1	7.3	7.3	
			Lead (%)	2.2	1.8	1.4	2.0	1.8	1.9	
			Silver (g/t)	208	161	133	183	172	174	
Aguilar	100%	OC	Ore (Mt)	–	0.4	–	0.4	–	0.8	AC
Aguilar pit			Zinc (%)	–	2.7	–	2.2	–	2.4	
			Lead (%)	–	2.2	–	2.3	–	2.2	
			Silver (g/t)	–	54	–	54	–	54	
Aguilar		UG	Ore (Mt)	0.5	0.7	0.4	0.4	0.9	1.1	AC
			Zinc (%)	6.9	7.1	7.0	7.9	6.9	7.3	
			Lead (%)	8.5	8.4	7.5	8.9	8.1	8.6	
			Silver (g/t)	163	178	127	142	148	165	
Total Other Zinc			**(Mt)**	**5.6**	**5.5**	**11.2**	**10.6**	**16.8**	**16.5**	
			Zinc (%)	**5.2**	**5.2**	**3.9**	**4.3**	**4.4**	**5.5**	
			Lead (%)	**1.7**	**2.0**	**1.0**	**1.4**	**1.2**	**1.9**	
			Copper (%)	**0.2**	**0.2**	**0.3**	**0.3**	**0.2**	**0.2**	
			Silver (g/t)	**124**	**126**	**103**	**120**	**110**	**122**	

Notes

Iscaycruz: Zinc, lead and copper mineralisation are exposed as subvertical massive sulphide orebodies; described as skarn, breccias and carbonate replacement type along 12km corridor hosted in clay-rich limestone and dolomite rocks. Hydrothermal mineralisation assemblages are mainly composed of sphalerite, galena, pyrite and chalcopyrite distributed in five production zones named Limpe Centro, Chupa, Tinyag II, Tinyag I and Santa Este from north to south. Changes of Resource grades and tonnages come from the completed 3D model, which contains geostatistical sub-domains which enable grade enhancement.

Changes to Sante Este Mineral Resources and Reserves are due to geological modelling and the addition of new drilling information.

Underground Reserves were generated at Chupa and Limpe Sur following a positive economic assessment. A Feasibility study to determine underground viability at Santa Este and Olga Norte is planned for 2019.

Mine was on Care and Maintenance throughout 2018.

The expected life of Iscaycruz is 2 to 3 years based on Ore Reserves and 3 to 5 years based on Mineral Resources.

Expiry date of relevant mining/concession licences: permanent.

Yauliyacu: Main mineralisation occurs as sphalerite, galena, tetrahedrite and chalcopyrite in 60° to 80° northwest dipping narrow veins, stockwork and minor replacement massive orebodies exposed in about 5km length extension and +2km depth extension. This hydrothermal mineralisation is strongly structurally controlled and hosted in folded rock units as calcareous sandstones (red beds), conglomerates, volcanic tuffs, andesites and limestones. Changes to the Resource are due to refinement of the model with additional zones of vein and disseminated mineralisation; changes to silver grades are mainly driven by the refinement factors used in the treatment of historical data.

Production for year 2018 to the end of December was 1.2Mt grading 2.1% Zn, 0.7% Pb and 75/t Ag.

The expected life of Yauliyacu is 6 years based on Ore Reserves and 10 years based on Mineral Resources.

Expiry date of relevant mining/concession licences: permanent.

Contonga: The Contonga Mine is a polymetallic deposit of Zinc, and Lead-Silver (and lesser Copper) skarns. The mine is located 425 km northeast of Lima in the Ancash region, and is adjacent to the world-class Antamina mine. The area is extremely rugged mountains, with relief on the property between 4,000 and 5,000 m in elevation. It has been in operation since the 1900s.

Production for year 2018 to the end of December was 0.4Mt grading 2.1% Zn, 0.22% Pb, 0.9% Cu and 30 g/t Ag.

The expected life of Contonga Mine is 3-4 years based on Ore Reserves and 5-6 years based on Mineral Resources.

Illapa and Sinchi Wayra: The majority of the deposits within the Illapa and Sinchi Wayra portfolio are epigenetic-hydrothermal base metal type vein and fault filled mineralisation hosted within a variety of lithologies from volcanic tuffs to sedimentary packages. The main mineral assemblages are composed of sphalerite, marmatite, galena, silver rich galena and silver sulfosalts. The resources are usually based on multiple structures with Porco containing over 100 different veins. The typical dimensions of these structures is +500m in length and +450m depth profile with mineralisation open at depth; average vein widths from 0.2 - 4.0m.

Caballo Blanco operational unit consists of three mines: Colquechaquita, Reserva and Tres Amigos, supplying the central plant “Don Diego” situated close to Potosi.

Regarding Porco, ore zones have been fully converted to 3D and reported; the Mineral Resource grades have increased (especially Zinc) as a results of new interpolation parameters, as dictated by variography. The increased Reserve grades and tonnages are also reflective of the Resource update.

Production for the year 2018 to the end of December for each of the operations was:

Bolivar – 0.25 Mt grading 8.2% Zn, 0.8% Pb and 207 g/t Ag.

Porco – 0.22 Mt grading 7.0% Zn, 0.6% Pb and 85g/t Ag.

Caballo Blanco – 0.23 Mt grading 6.4% Zn, 1.8% Pb and 198g/t Ag.

The expected life of the mines as a group, considering current production capacities, is an average of 5 years based on Ore Reserves and 7 to 10 years based on Mineral Resources.

According to the new Bolivian Constitution enacted in 2009, natural resources belong to the Bolivian people. The Bolivian State can enter into mining contracts with private investors to operate them. As with all private investors in Bolivia, Illapa and Sinchi Wayra do not hold property rights over mining resources in the country, but rather hold the right to exploit them pursuant to Bolivian legislation.

Expiry date of relevant mining concessions / authorisations or contracts is different for each mine: Porco and Bolivar – July 2028 (joint venture agreement entered into in 2013) and permanent in respect of Caballo Blanco.

Aguilar: Mineralisation is classified as sedex type with sulphide layers in between siliciclastic and shale rocks with a post-secondary metasomatic over print between two intrusive stocks. Galena-rich, sphalerite, marmatite pyrite orebodies as lenses shape, locally brittle-style hydrothermal breccias, minor veinlets-stockworks and dissemination defines the economic portion of mineral inventories. Strike length extension of mineral geometries is variable and reaches up to 300m on north-south extension, about 55m in width and reaches up to 160m in depth.

The decrease in the underground mineral resources is the result of a sterilization campaign on portions of Piqué Inferior and Capa A Contacto that are impossible to access. There has been no effect on the ore reserves as these zones were not previously considered part of the ore reserve. Under the current economic assumptions, remaining mineral resources in the Aguilar open pit have not been modified to ore reserves.

Production for year 2018 from both underground and open pit was 0.25Mt grading 8.0% Zn, 11.4% Pb and 213g/t Ag.

The remaining mine life is approximately 2-3 years based on Ore Reserves and 4-5 years based on Mineral Resources.

Expiry date of relevant mining/concession licences: permanent.

Expiry date of ML 39+AW (Mining Licence and Accessory Works) is 11 February 2020.

Pallas Green: The Pallas Green project is situated near Limerick in Southwestern Ireland. The Tobermalug zone consists of multiple, subhorizontal, stratiform lenses of Irish-type, breccia-hosted, sphalerite-galena-pyrite within a Carboniferous limestone. The lenses occur over an area 4,000m by 4,000m, and from 300m to 1,300m below surface.

The Inferred Mineral Resource is based on 392,000m of diamond drilling in 775 drill holes completed between 2002 and the end of 2017. Drill spacing is nominally 100m, but 178 infill drill holes at 50m spacing have been completed. Mineralisation wireframes were built, taking into account a cut-off of Zn+Pb and a minimum 3.0m true thickness, and constrain interpolation by Inverse Distance Weighting (IDW) in a block model.

Competent Person

AC = Aline Côté, Head of Mining Technical Services, Glencore Zinc, (OGQ).

AH = Allan Huard, Senior Geologist, Glencore Zinc, (APGO).

Metals and Minerals
Nickel

Integrated Nickel Operations (INO) Mineral Resources (Raglan, Sudbury)

Name of operation	Attributable Interest	Mining Method	Commodity	Measured Mineral Resources 31.12.18	Measured Mineral Resources 31.12.17	Indicated Mineral Resources 31.12.18	Indicated Mineral Resources 31.12.17	Measured and Indicated Resources 31.12.18	Measured and Indicated Resources 31.12.17	Inferred Mineral Resources 31.12.18	Inferred Mineral Resources 31.12.17	Competent Person
Raglan	100%	UG	(Mt)	6.50	6.61	14.20	13.80	20.7	20.4	14	14	DP
			Nickel (%)	3.75	3.79	3.15	3.14	3.34	3.35	3.0	3.0	
			Copper (%)	0.92	0.91	0.96	0.96	0.95	0.94	0.9	0.9	
			Cobalt (%)	0.08	0.08	0.07	0.07	0.07	0.07	0.07	0.1	
			Platinum (g/t)	1.00	0.99	0.94	0.93	0.96	0.95	0.9	0.9	
			Palladium (g/t)	2.41	2.39	2.35	2.33	2.37	2.35	2.2	2.2	
Sudbury	100%	UG	(Mt)	5.68	8.03	23.25	20.84	28.9	28.9	25	20	SEK
			Nickel (%)	1.59	1.71	2.10	2.26	2.00	2.11	0.9	1.0	
			Copper (%)	1.49	1.59	2.50	2.38	2.30	2.16	2.6	2.5	
			Cobalt (%)	0.04	0.04	0.05	0.05	0.05	0.05	0.03	-	
			Platinum (g/t)	0.87	0.84	0.91	0.91	0.90	0.89	1.0	1.0	
			Palladium (g/t)	0.83	0.86	1.07	1.04	1.02	0.99	1.2	1.2	
Total INO			**(Mt)**	**12.2**	**14.6**	**37.5**	**34.6**	**49.6**	**49.3**	**39**	**34**	
			Nickel (%)	**2.74**	**2.65**	**2.50**	**2.61**	**2.56**	**2.62**	**1.7**	**1.8**	
			Copper (%)	**1.19**	**1.28**	**1.92**	**1.81**	**1.74**	**1.66**	**2.0**	**1.8**	
			Cobalt (%)	**0.06**	**0.06**	**0.06**	**0.06**	**0.06**	**0.06**	**0.04**	**0.1**	
			Platinum (g/t)	**0.94**	**0.91**	**0.92**	**0.92**	**0.93**	**0.91**	**1.0**	**1.0**	
			Palladium (g/t)	**1.67**	**1.55**	**1.56**	**1.55**	**1.58**	**1.55**	**1.6**	**1.6**	

Integrated Nickel Operations Ore Reserves (Raglan, Sudbury)

Name of operation	Attributable Interest	Mining Method	Commodity	Proved Ore Reserves 31.12.18	Proved Ore Reserves 31.12.17	Probable Ore Reserves 31.12.18	Probable Ore Reserves 31.12.17	Total Ore Reserves 31.12.18	Total Ore Reserves 31.12.17	Competent Person
Raglan	100%	UG	Ore (Mt)	4.57	4.79	6.70	7.64	11.28	12.43	RC
			Nickel (%)	2.83	2.90	2.76	2.83	2.79	2.86	
			Copper (%)	0.70	0.71	0.80	0.78	0.76	0.75	
			Cobalt (%)	0.06	0.06	0.06	0.06	0.06	0.06	
			Platinum (g/t)	0.75	0.77	0.87	0.88	0.82	0.84	
			Palladium (g/t)	1.83	1.81	2.14	2.09	2.01	1.98	
Sudbury	100%	UG	Ore (Mt)	5.74	6.33	15.03	14.23	20.77	20.56	SEK
			Nickel (%)	1.26	1.38	2.06	2.15	1.84	1.91	
			Copper (%)	1.17	1.49	0.98	1.00	1.03	1.15	
			Cobalt (%)	0.03	0.03	0.05	0.05	0.04	0.04	
			Platinum (g/t)	0.66	0.79	0.37	0.36	0.45	0.49	
			Palladium (g/t)	0.62	0.80	0.42	0.41	0.47	0.53	
Total INO			**(Mt)**	**10.3**	**11.1**	**21.7**	**21.9**	**32.0**	**33.0**	
			Nickel (%)	**1.96**	**2.03**	**2.28**	**2.39**	**2.17**	**2.27**	
			Copper (%)	**0.96**	**1.15**	**0.92**	**0.92**	**0.94**	**1.00**	
			Cobalt (%)	**0.04**	**0.04**	**0.05**	**0.05**	**0.05**	**0.05**	
			Platinum (g/t)	**0.70**	**0.78**	**0.52**	**0.54**	**0.58**	**0.62**	
			Palladium (g/t)	**1.16**	**1.24**	**0.95**	**1.00**	**1.02**	**1.08**	

Metals and Minerals Nickel

Notes

For the purposes of this statement, the term 'Ore Reserves' as defined by the JORC Code 2012 has the same meaning as 'Mineral Reserves' as defined in the CIM Standards 2014. The resource totals have been restated in compliance with the JORC Code.

There are no known environmental, permitting, legal, taxation, political or other relevant issues that would materially affect the estimates of the Mineral Reserves.

Depending on when production is scheduled, Mineral Reserves and Resources are calculated using a blend of short, medium, or long term metal price assumptions and exchange rates.

Raglan: Ni-Cu-Co-PGE mineralisation is located at or near the base of subvolcanic mafic-ultramafic intrusive complexes referred to as the "Raglan Formation". Resources are generally determined at a 1.5% Ni cut-off and are composed of disseminated, net-textured, and massive pyrrhotite-pentlandite-chalcopyrite rich sulphides contained within more than 135 individual sulphide lenses, extending from surface to more than 900m vertical depth. The size of these high-grade sulphide lenses varies significantly from 0.01Mt to 5.2Mt, averaging 0.2Mt. Mineral Reserves are sufficient to support a 7 year mine life. Significant undeveloped Mineral Resources provide an opportunity to extend mine life by more than 10 years. Expiry date of relevant mining leases and exploration licenses: depending on the mine/project, range from 19 June 2019 to 25 June 2038.

Sudbury: Sulphide deposits sit on broadly defined trends of mineralisation along basal brecciated rocks of the Sudbury Igneous Complex as pentlandite-pyrrhotite-chalcopyrite rich concentrations as well as within the underlying footwall in fractured pathways as chalcopyrite dominated polymetallic (Cu, Ni, Au, Ag, Pt, Pd) vein-style sulphides. The total Ore Reserve tonnage increased from 2017 due to the conversion of Mineral Resources at Fraser and Nickel Rim South mines. Cut-off grades are calculated for each individual mine site or resource based on a metal equivalent or net smelter return value taking into account all recoverable metals. The expected reserve-based mine life is 16 years. All Land holdings in Sudbury covering existing Ore Reserves are patented and 100% owned by Glencore. Mineral Resources are also patented with the exception of areas covered by two licences of occupation which are held in perpetuity and several mining leases which expire in 2033 and 2035.

Competent Persons

DP = Daniel Patry, Glencore Nickel, P.Geo (OGQ).

RC = Richard Caumartin, Glencore Nickel, P.Eng. (OIQ).

SEK = Steve Kormos, Glencore Nickel, P. Geo. (APGO).

Metals and Minerals Nickel

Murrin Murrin Mineral Resources

Name of operation	Attributable Interest	Mining Method	Commodity	Measured Mineral Resources 31.12.18	Measured Mineral Resources 31.12.17	Indicated Mineral Resources 31.12.18	Indicated Mineral Resources 31.12.17	Measured and Indicated Resources 31.12.18	Measured and Indicated Resources 31.12.17	Inferred Mineral Resources 31.12.18	Inferred Mineral Resources 31.12.17	Competent Person
Murrin Murrin	100%	OC	(Mt)	138.4	140.9	75.5	77.4	214.0	218.3	17	18	SK
			Nickel (%)	1.01	1.00	0.99	0.99	1.01	1.00	0.9	0.9	
			Cobalt (%)	0.075	0.074	0.084	0.084	0.078	0.078	0.07	0.07	

Murrin Murrin Ore Reserves

Name of operation	Attributable Interest	Mining Method	Commodity	Proved Ore Reserves 31.12.18	Proved Ore Reserves 31.12.17	Probable Ore Reserves 31.12.18	Probable Ore Reserves 31.12.17	Total Ore Reserves 31.12.18	Total Ore Reserves 31.12.17	Competent Person
Murrin Murrin	100%	OC	Ore (Mt)	83.1	85.5	18.5	18.9	101.7	104.3	MR/PW
			Nickel (%)	1.05	1.04	1.05	1.06	1.05	1.05	
			Cobalt (%)	0.082	0.080	0.078	0.077	0.081	0.079	

Koniambo Mineral Resources

Name of operation	Attributable Interest	Mining Method	Commodity	Measured Mineral Resources 31.12.18	Measured Mineral Resources 31.12.17	Indicated Mineral Resources 31.12.18	Indicated Mineral Resources 31.12.17	Measured and Indicated Resources 31.12.18	Measured and Indicated Resources 31.12.17	Inferred Mineral Resources 31.12.18	Inferred Mineral Resources 31.12.17	Competent Person
Koniambo	49%	OC	(Mt)	12.8	13.8	43.6	43.2	56.4	57.0	83	83	HD
			Nickel (%)	2.48	2.49	2.40	2.40	2.42	2.42	2.5	2.5	

Koniambo Ore Reserves

Name of operation	Attributable Interest	Mining Method	Commodity	Proved Ore Reserves 31.12.18	Proved Ore Reserves 31.12.17	Probable Ore Reserves 31.12.18	Probable Ore Reserves 31.12.17	Total Ore Reserves 31.12.18	Total Ore Reserves 31.12.17	Competent Person
Koniambo	49%	OC	Ore (Mt)	11.7	11.2	30.1	25.9	41.8	37.1	HD
			Nickel (%)	2.27	2.30	2.20	2.22	2.22	2.25	

Other Nickel Mineral Resources

Name of operation	Attributable Interest	Mining Method	Commodity	Measured Mineral Resources 31.12.18	Measured Mineral Resources 31.12.17	Indicated Mineral Resources 31.12.18	Indicated Mineral Resources 31.12.17	Measured and Indicated Resources 31.12.18	Measured and Indicated Resources 31.12.17	Inferred Mineral Resources 31.12.18	Inferred Mineral Resources 31.12.17	Competent Person
Kabanga	50%	UG	(Mt)	13.8	13.8	23.4	23.4	37.2	37.2	21	21	SEK
			Nickel (%)	2.49	2.49	2.72	2.72	2.63	2.63	2.6	2.6	
			Copper (%)	0.34	0.34	0.36	0.36	0.35	0.35	0.3	0.3	
			Cobalt (%)	0.21	0.21	0.19	0.19	0.20	0.20	0.2	0.2	
			Platinum (g/t)	0.16	0.16	0.42	0.42	0.32	0.32	0.3	0.3	
			Palladium (g/t)	0.19	0.19	0.28	0.28	0.25	0.25	0.3	0.3	

Notes

For the purposes of this statement, the term 'Ore Reserves' as defined by the JORC Code 2012 has the same meaning as 'Mineral Reserves' as defined in the CIM Standards 2014. The Mineral Resource totals have been restated in compliance with the JORC Code.

There are no known environmental, permitting, legal, taxation, political or other relevant issues that would materially affect the estimates of the Mineral Reserves.

Depending on when production is scheduled, Mineral Reserves and Resources are calculated using a blend of short, medium, or long term metal price assumptions and exchange rates.

Murrin Murrin: Nickel and cobalt mineralisation at Murrin is hosted within a laterite formed from the weathering of ultramafic rocks. The resources are hosted in multiple deposits over three main project areas (North, South and East). Mineral Resource and Ore Reserve figures as at 31 December 2018 are generated by depletion of the resource models by using end-of-period surface surveys as at 30 September 2018, with adjustments applied for October to December forecast production. Resources are determined at a 0.8% Ni cut-off.

The Murrin 2018 Ore Reserve estimate is based on the optimised Base Case pit shells for Measured and Indicated Mineral Resources, and includes scats and stockpiles. Updates to process modelling, 4-yearly shutdown costs and operating costs have been included. The Ore Reserve tonnage has decreased in 2017, mostly attributable to the comprehensive re-optimisation of the ore body and mine plan.

Ore Reserve grades have been subject to the application of grade modifying factors. These have been derived from analysis of the latest applicable two years mine-to-mill grade performance and result in grade modifying factors of 97.6% and 88.6% for nickel and cobalt respectively.

Remaining mine life: the most recent Life of Mine schedule indicates the remaining mine life is 17 years. Expiry dates for relevant tenements differ for each tenement and range from 2020 to 2037.

Koniambo: Nickel rich laterite deposits are developed on variably serpentinized ultramafic rocks. The Ore Reserve estimate for the deposit was established from a new Life of Mine Resource Model established in 2015 and updated in 2017. Resources in active pits are updated as of October 2018. Mineral Resources incorporate the expected production for November-December 2018 and the ore inventory at 31st October 2018. Mineral Resources have been calculated by 3D modelling and Conditional Simulations within the LOM area and Trazy. In areas outside the LOM footprint, Mineral Resources were estimated by the plan polygonal method. The reserve cut-off grade used is 2.0% Ni. The production rate is currently ramping up to reach a throughput of 2.5Mtpa by 2023. The expected mine life is 17 years. The expiry date of relevant mining property licences is 31 December 2048. Production began in April 2013 and mining is supporting a two-line operation at the Metallurgical Plant as at 31 December 2018. Ore Reserves stated include an estimated 152kt at 2.30% of stockpiles between the mine and process plant. Ore Reserve increase compared to last year is mainly due to an improved recovery of the resource, confirmed by reconciliation. Ore Reserves and Mineral Resources exclude an additional 30 million tonnes of medium grade material at 1.9% Ni below the current cut-off grade (< 2.0% Ni).

Kabanga: The current delineated Mineral Resource is comprised of 88% of contact-style massive sulphide and 12% of ultramafic-hosted disseminated to semi-massive sulphide mineralisation. The ultramafic bodies are hosted in a sequence of metamorphosed pelitic sediments that are overturned, steeply dipping. All resource estimates are done using Ordinary Kriging and are based on block models with appropriate variography. A cut-off grade of 1% Ni-equivalent is used for all Mineral Resources except ultramafic-hosted disseminated to semi-massive sulphide (UMIN) mineralisation at Tembo (1.1% Ni cut-off grade applied). The contribution to the Ni-equivalent value is provided by copper, cobalt and platinum group elements. The last Mineral Resource drilling campaign was done in 2009 and the latest Mineral Resource estimate dates from June 2010. The delineated Kabanga Mineral Resources are sufficient to support a 30 year mine life as currently studied.

All Mineral Resources were historically held under a Retention Licence (RL) which was valid until 2 May 2019. In January 2018, the Government of Tanzania issued the new Mining (Mineral Rights) Regulations, 2018 which legislation stated that all outstanding RLs including Kabanga Nickel's RL 0001/2009, were cancelled with immediate effect. However, no further steps were taken by the Government of Tanzania to implement this new legislation, and the RL has not yet been formally cancelled. Upon being notified of the new legislation, Kabanga Nickel commenced a dialogue with the Minister of Minerals and the Commissioner for Minerals to understand and work with the appropriate sections of the Tanzanian Government to secure the land tenure over the same area that is covered by the RL. Pursuant to these discussions, on April 24, 2018, Kabanga Nickel submitted a new application for a Prospecting Licence (PL) over the same area that is covered by the RL, and is currently awaiting feedback and approval of this new PL.

Competent Persons

HD = Hubert Dumon, Koniambo Nickel SAS, (AusIMM).

MR = Mitch Rohr, Minara Resources Pty Ltd., (mining and metallurgical costs, reserve optimisation), (AusIMM).

PW = Paul Wiltshire, Minara Resources Pty Ltd., (process plant modelling assumptions), (AusIMM).

SK = Stephen King, Minara Resources Pty Ltd., (geostatistical analysis, modelling/estimation and resource classification), (AusIMM).

SEK = Steve Kormos, Glencore Nickel, P. Geo (APGO).

Metals and Minerals
Ferroalloys

Chrome Mineral Resources

Bushveld Complex – Western Limb

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources 31.12.18	Measured Mineral Resources 31.12.17	Indicated Mineral Resources 31.12.18	Indicated Mineral Resources 31.12.17	Measured and Indicated Resources 31.12.18	Measured and Indicated Resources 31.12.17	Inferred Mineral Resources 31.12.18	Inferred Mineral Resources 31.12.17	Competent Person
Western Chrome Mines – LG6 Chromitite Package and MG1 Chromitite Layer												
Waterval Mine	79.5%	UG	Ore (Mt)	16.231	16.044	1.02	0.98	17.26	17.03	0.7	0.6	MM/DR
			Cr_2O_3 (%)	41.31	41.30	42.6	42.6	41.4	41.4	43	43	
Marikana West	79.5%	UG	Ore (Mt)	2.947	2.827	1.69	1.60	4.64	4.43	–	–	MM/DR
			Cr_2O_3 (%)	42.44	42.44	42.6	42.6	42.5	42.5	–	–	
Kroondal Mine	79.5%	UG/OC	Ore (Mt)	8.590	8.803	1.57	1.57	10.16	10.37	–	–	MM/DR
			Cr_2O_3 (%)	42.84	42.70	41.6	41.6	42.6	42.5	–	–	
Kroondal	79.5%	UG/OC	Ore (Mt)	10.037	10.649	4.96	4.42	15.00	15.07	–	–	MM/DR
Gemini			Cr2O3 (%)	42.56	42.59	41.4	41.6	42.2	42.3	–	–	
Marikana East	79.5%	UG	Ore (Mt)	4.193	4.196	0.79	0.78	4.98	4.98	–	–	MM/DR
			Cr_2O_3 (%)	42.25	42.25	41.8	41.8	42.2	42.2	–	–	
Klipfontein/	79.5%	UG	Ore (Mt)	9.952	11.729	16.92	16.98	26.87	28.71	106.9	115.0	MM/DR
Waterval			Cr_2O_3 (%)	42.10	42.12	42.0	42.0	42.0	42.0	42	42	
Boshoek	79.5%	UG/OC	Ore (Mt)	–	–	17.09	17.09	17.09	17.09	–	–	MM/DR
			Cr_2O_3 (%)	–	–	40.5	40.5	40.5	40.5	–	–	
Townlands	79.5%	UG	Ore (Mt)	–	–	12.94	12.94	12.94	12.94	–	–	MM/DR
Extension 9			Cr_2O_3 (%)	–	–	41.4	41.4	41.4	41.4	–	–	
Total LG6 and MG1			**(Mt)**	**51.951**	**54.248**	**57.00**	**56.38**	**108.95**	**110.63**	**107.6**	**115.6**	
			Cr_2O_3 (%)	**42.10**	**42.09**	**41.4**	**41.4**	**41.7**	**41.7**	**42**	**42**	
Western Chrome Mines – Tailings												
Tailings	79.5%		Mt	–	–	–	–	–	–	2.6	1.0	MM
			Cr_2O_3 (%)	–	–	–	–	–	–	17	17	

Bushveld Complex – Eastern Limb

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources 31.12.18	Measured Mineral Resources 31.12.17	Indicated Mineral Resources 31.12.18	Indicated Mineral Resources 31.12.17	Measured and Indicated Resources 31.12.18	Measured and Indicated Resources 31.12.17	Inferred Mineral Resources 31.12.18	Inferred Mineral Resources 31.12.17	Competent Person
Eastern Chrome Mines –MG1 Chromitite Layer												
Thorncliffe	79.5%	UG/OC	Ore (Mt)	36.445	36.406	14.40	15.27	50.85	51.67	0.2	0.3	SV/DR
			Cr_2O_3 (%)	40.44	40.61	41.2	41.3	40.6	40.8	42	41	
Helena	79.5%	UG/OC	Ore (Mt)	23.667	23.309	13.58	14.53	37.25	37.84	9.1	9.1	SV/DR
			Cr_2O_3 (%)	39.75	39.84	38.4	39.0	39.3	39.5	38	39	
De Grooteboom	79.5%	UG/OC	Ore (Mt)	1.038	1.036	0.50	0.50	1.54	1.54	–	–	SV/DR
			Cr_2O_3 (%)	40.23	40.23	40.3	40.3	40.3	40.3	–	–	
Richmond	79.5%	UG	Ore (Mt)	0.595	0.613	12.26	12.28	12.86	12.89	13.9	13.9	SV/DR
			Cr_2O_3 (%)	41.32	41.33	41.1	41.1	41.1	41.1	41	41	
St George	79.5%	UG	Ore (Mt)	–	–	4.92	3.20	4.92	3.20	6.1	7.2	SV/DR
			Cr_2O_3 (%)	–	–	39.6	39.4	39.6	39.4	40	40	
Total MG1			**(Mt)**	**61.743**	**61.364**	**45.67**	**45.78**	**107.41**	**107.14**	**29.3**	**30.5**	
			Cr_2O_3 (%)	**40.18**	**40.32**	**40.2**	**40.4**	**40.2**	**40.3**	**40**	**40**	
Eastern Chrome Mines – MG2 Chromitite Layer												
Thorncliffe Mine	79.5%	UG/OC	Ore (Mt)	–	–	–	–	–	–	41.8	41.8	SV/DR
			Cr_2O_3 (%)	–	–	–	–	–	–	38	38	
Helena Mine	79.5%	UG/OC	Ore (Mt)	–	–	–	–	–	–	85.4	85.4	SV/DR
			Cr_2O_3 (%)	–	–	–	–	–	–	38	38	
Total MG2			**(Mt)**	**–**	**–**	**–**	**–**	**–**	**–**	**127.2**	**127.2**	
			Cr_2O_3 (%)	**–**	**–**	**–**	**–**	**–**	**–**	**38**	**38**	
Total MG1 and MG2			**(Mt)**	**61.743**	**61.364**	**45.67**	**45.78**	**107.41**	**107.14**	**156.5**	**157.7**	
			Cr_2O_3 (%)	**40.18**	**40.32**	**40.2**	**40.4**	**40.2**	**40.3**	**38**	**38**	
Eastern Chrome Mines – Tailings												
Tailings	79.5%		Mt	–	–	–	–	–	–	4.2	–	SV
			Cr_2O_3 (%)	–	–	–	–	–	–	19	–	

Metals and Minerals
Ferroalloys

Chrome Ore Reserves

Bushveld Complex – Western Limb

Name of operation	Attributable interest	Mining method	Commodity	Proved Ore Reserves 31.12.18	Proved Ore Reserves 31.12.17	Probable Ore Reserves 31.12.18	Probable Ore Reserves 31.12.17	Total Ore Reserves 31.12.18	Total Ore Reserves 31.12.17	Competent Person
Western Chrome Mines – LG6 Chromitite Package and MG1 Chromitite Layer										
Waterval	79.5%	UG	Ore (Mt)	8.802	8.548	0.95	0.89	9.75	9.44	MM/DR
			Cr_2O_3 (%)	31.12	31.36	26.2	26.8	30.6	30.9	
Marikana West	79.5%	UG	Ore (Mt)	0.146	0.150	-	–	.015	0.15	MM/DR
			Cr_2O_3 (%)	29.49	29.88	-	–	29.5	29.9	
Kroondal	79.5%	UG/OC	Ore (Mt)	1.901	2.199	1.38	1.36	3.28	3.56	MM/DR
			Cr_2O_3 (%)	29.59	29.38	28.6	28.8	29.2	29.2	
Kroondal Gemini	79.5%	UG/OC	Ore (Mt)	5.625	6.036	4.73	4.05	10.35	10.08	MM/DR
			Cr_2O_3 (%)	31.23	31.57	28.8	28.9	30.1	30.5	
Marikana East	79.5%	UG	Ore (Mt)	0.423	0.725	-	0.15	0.42	0.87	MM/DR
			Cr_2O_3 (%)	28.63	28.58	-	28.5	28.6	28.6	
Klipfontein/	79.5%	UG	Ore (Mt)	0.521	0.820	0.30	0.34	0.82	1.16	MM/DR
Waterval			Cr_2O_3 (%)	28.70	28.65	28.5	28.7	28.6	28.7	
Boshoek	79.5%	UG/OC	Ore (Mt)	-	–	0.58	0.58	0.58	0.58	MM/DR
			Cr_2O_3 (%)	-	–	26.1	26.1	26.1	26.1	
Total LG6 and MG1			**(Mt)**	**17.418**	**18.477**	**7.94**	**7.37**	**25.36**	**25.84**	
			Cr_2O_3 (%)	**30.84**	**31.00**	**28.2**	**28.4**	**30.0**	**30.4**	

Bushveld Complex – Eastern Limb

Name of operation	Attributable interest	Mining method	Commodity	Proved Ore Reserves 31.12.18	Proved Ore Reserves 31.12.17	Probable Ore Reserves 31.12.18	Probable Ore Reserves 31.12.17	Total Ore Reserves 31.12.18	Total Ore Reserves 31.12.17	Competent Person
Eastern Chrome Mines – MG1 Chromitite Layer										
Thorncliffe Mine	79.5%	UG/OC	Ore (Mt)	19.719	24.093	10.03	9.09	29.74	33.18	SV/DR
			Cr_2O_3 (%)	33.31	35.13	34.2	35.9	33.6	35.3	
Helena Mine	79.5%	UG/OC	Ore (Mt)	3.241	2.957	–	–	3.24	2.96	SV/DR
			Cr_2O_3 (%)	32.55	33.92	–	–	32.6	33.9	
Total MG1			**(Mt)**	**22.961**	**27.050**	**10.03**	**9.09**	**32.99**	**36.14**	
			Cr_2O_3 (%)	**33.20**	**35.00**	**34.2**	**35.9**	**33.5**	**35.2**	

Notes

Tonnages are quoted as million metric tonnes.

Grades are quoted as %Cr_2O_3.

The Measured and Indicated Mineral Resources are inclusive of those Mineral Resources modified to produce Ore Reserves.

The chromitite assets include those owned by Glencore and Merafe in different ownership percentages, the attributable interest in such assets remain as reflected.

All Glencore Ferroalloys' chrome operations mine the chromitite deposits developed within the world renowned Bushveld Complex of South Africa. The 2060 Ma year-old Bushveld Complex is the largest known deposit of chrome, vanadium and platinum group elements (PGEs) in the world. The Bushveld Complex stretches 350km east-west and 450km north-south. The chrome ore is mined from shallow dipping (10° – 14°) tabular orebodies. Although there are numerous chromitite layers developed in the Bushveld Complex, the chromitite layers targeted for economic exploitation are the LG6/LG6A Chromitite Layer package and the MG1 Chromitite Layer.

No cut-off grades are applied to the chromitite layers being mined. The chromitite layers are mined from contact to contact and no selective mining cuts are applied. The chromitite layer grades show exceptional regional grade consistency and continuity.

The chromitite layers are mostly mined underground using trackless mechanised mining methods on a board and pillar mine layout design.

The Mineral Resources are estimated as chromitite tonnages and grades to reflect the grades of the various individual chromitite layers and have been presented by separate layers for clarity in this report. There were no year-on-year changes to the underlying processes, estimates and methodology. To this end the Mineral Resources for the Eastern Limb properties have been split between the MG1 and MG2 Chromitite Layers. Both the LG6 and MG1 Chromitite Layers which Glencore currently mine are discrete solid chromitite layers with sharp contacts.

Changes in the year on year Mineral Resource tonnage and grade estimates are mainly due to mining depletion and changes due to additional geological information gained through exploration. These changes reflect in the tonnage and grade reports from the grade block models.

The tonnage and grades for all the tailings facilities that can be economically processed have been estimated and declared in this report. For a number of the tailings facilities this will be the initial declaration as reflected in the accompanying tables.

Eastern Chrome Mines: The mining complex consisting of the Thorncliffe, Helena, and Magareng Mines had a net increase in Mineral Resources of 4.102Mt after mining depletion. The increase is mainly due to the re-estimation of the

underground pillars for Helena -, Magareng - and Thorncliffe Mines.

Western Chrome Mines: The chrome mining complex consist of the operating mines of Kroondal and Waterval as well as the resource areas of Klipfontein/Waterval and Boshoek. The Mineral Resources had a net decrease of -8.582Mt after mining depletion. This decrease is mainly due to the exchange of resource blocks with Rustenburg Chrome Mines amounting to 8.098Mt.

The tonnage and grade estimations for the chromitite layers are initiated by the geostatistical analysis of the exploration drill hole data. The outcomes of this analysis are used in the construction of block models for each and every mine and project area. The geostatistical analysis of the chromitite data indicates a high degree of continuity both in grade and thickness of the chromitite layers. The block model estimates are verified using geostatistical parameters such as Kriging Efficiency to test the stability of the variograms used and the suitability of the selected cell sizes and Kriging parameters. Post-estimate validations are done using swath plots and quantile-quantile plots. Tonnages and grades are reported from these block models for each mine and project. There is a high degree of confidence in the tonnage and grade estimations derived from the block models. This is confirmed by the monthly and yearly reconciliation between the block model estimates, the monthly survey measurements and the actual mine production for each operating mine. The tailings facility estimates are based on daily production sampling and dam volume surveying by a certified surveyor. The Eastern Chrome Mines Tailings Facilities have been added to this report. For the Western Chrome Mines two additional tailings facilities have been added to the Kroondal Tailings Facility.

The LOM for the operating chrome mines vary between 1 year and 5 years based on the declared Ore Reserves. The LOM periods for the various operating mines, based on all the Mineral Resources converted to Ore Reserves vary between 5 years and 38 years. The Mining Right expiry dates vary from 2022 to 2039 for the operating chrome mines. All the chrome mining rights were granted for an initial period of 30 years. The production rates for the various chrome mines vary from 30kt ROM per month to 112kt ROM per month.

The application lodged to incorporate the St George and Richmond Prospecting Right areas into the existing Eastern Chrome Mines Mining Right area is being processed by the relevant authorities.

Competent Persons

PJG = Pieter-Jan Gräbe, Glencore Ferroalloys, (SACNASP); overall responsibility for Mineral Resources and Ore Reserves.

SV = Solly Vaid, Glencore Ferroalloys, (PLATO); responsibility for Mineral Resources and Ore Reserves.

DR = Dean Richards, Obsidian Consulting Services (SACNASP); responsible for geostatistical analysis of data, Mineral Resource classification and construction of tonnage and grade block models and reporting of tonnage and grades from block models.

MM = Mogomotsi Maputle, Glencore Ferroalloys, (SACNASP), Responsible for Mineral Resources and Ore Reserves.

Metals and Minerals Ferroalloys

Vanadium Mineral Resources

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources 31.12.18	Measured Mineral Resources 31.12.17	Indicated Mineral Resources 31.12.18	Indicated Mineral Resources 31.12.17	Measured and Indicated Resources 31.12.18	Measured and Indicated Resources 31.12.17	Inferred Mineral Resources 31.12.18	Inferred Mineral Resources 31.12.17	Competent Person
Rhovan	74.0%	OC	(Mt)	48.36	49.68	37.67	38.12	86.04	87.81	93	94	DR/SM
			V_2O_5 (%)	0.48	0.48	0.5	0.5	0.5	0.5	0.5	0.5	

Vanadium Ore Reserves

Name of operation	Attributable interest	Mining method	Commodity	Proved Ore Reserves 31.12.18	Proved Ore Reserves 31.12.17	Probable Ore Reserves 31.12.18	Probable Ore Reserves 31.12.17	Total Ore Reserves 31.12.18	Total Ore Reserves 31.12.17	Competent Person
Rhovan	74.0%	OC	Ore (Mt)	23.94	25.30	11.5	12.1	35.4	37.4	DR/SM
			V_2O_5 (%)	0.47	0.47	0.5	0.5	0.5	0.5	

Notes

Tonnages are quoted as million metric tonnes.

Grades are quoted as %V_2O_5.

The Measured and Indicated Mineral Resources are inclusive of those Mineral Resources modified to produce Ore Reserves.

Glencore Ferroalloys' vanadium mining operations mine the vanadiferous magnetite deposits developed within the Bushveld Complex, South Africa. The 2060 Ma year-old Bushveld Complex is the largest known deposit of chrome, vanadium and platinum group elements (PGE's) in the world.

The magnetite ore is mined from shallow dipping (6o – 25o) stratified magnetite orebodies developed in the Upper Zone of the Bushveld Complex. Various ore zones with varying grades can be identified in the orebody. The ore zones are defined based on their magnetite and vanadium content.

The magnetite ore is mined using open cast mining methods.

No material changes were recorded compared with the 2017 resource and reserve estimation.

Rhovan: There was a net increase of 0.059Mt in the Mineral Resource estimate after mining depletions have been discounted.

The Ore Reserves had a net increase of 0.297Mt after mining depletions have been discounted.

Obsidian Consulting Services has estimated the Mineral Resources for Pit 1 and Pit 6. An updated grade block model with new data was constructed during October 2018, following the addition of blast hole data for the 2017-2018 reporting period.

The tonnage and grade estimations were done using geo-statistical analysis of the exploration drill hole and blast hole data. From this analysis, the most appropriate parameters for the construction of block models for the various pits were derived. The block model estimates are verified using geostatistical parameters such as Kriging Efficiency and Slope of Regression to test the stability of the variograms used and the suitability of the selected cell sizes. A final geospatial validation is done by means of swath and QQ plots. Other validations included a comparison of distributions of the source data versus estimated results. Tonnages and grades are reported from the block models for each pit. The degree of confidence in the tonnage and grade estimations derived from the block models is reflected in the classified Mineral Resource classes.

The Rhovan LOM based on the declared Ore Reserves is 12.7 years. The LOM based on all the Mineral Resources converted to Ore Reserves is over 30 years. Rhovan is mining from various open cast pits at an actual mining rate averaging 141.1kt of ROM per month (year to date). The stripping ratio averaged 2.28 (t:t).

The Mining Right expires in 2027.

Competent Persons

PJG = Pieter-Jan Gräbe, Glencore Ferroalloys, (SACNASP); overall responsibility for Mineral Resources and Ore Reserves.

DR = Dean Richards, Obsidian Consulting Services, (SACNASP); responsible for data validation, geo-statistical analysis of data, construction of tonnage and grade block models and reporting of tonnage and grades from block models for Mineral Resource and Ore Reserve estimates.

SM = Sydney Maseti, Glencore Ferroalloys, (SACNASP); Responsible for Mineral Resources and Ore Reserves..

Metals and Minerals
Aluminium/Alumina

Aurukun Mineral Resources

Name of operation	Attributable Interest	Mining Method	Commodity	Measured Mineral Resources		Indicated Mineral Resources		Measured and Indicated Resources		Inferred Mineral Resources		Competent Person
				31.12.18	31.12.17	31.12.18	31.12.17	31.12.18	31.12.17	31.12.18	31.12.17	
Aurukun	100%	OC	(Mt)	94	-	322	-	416	-	3	-	JB
			Al_2O_3 (%)	53.4	-	50.0	-	50.7	-	49.5	-	

Notes

The Aurukun Bauxite deposits are located on the western side of the Cape York Peninsula in far north Queensland, Australia. Glencore currently holds tenure to the deposits via a mineral development licence or "MDL" granted in late 2017, which allows feasibility studies to be performed. Currently there is no production from the MDL.

In 2004 and 2005, the Queensland State government funded the Aurukun Geoscientific Investigation Programme. The programme involved drilling approximately 8,500 drill holes and produced approximately 200,000 samples at 0.25m intervals. Most samples were assayed. All samples sent to the lab were beneficiated at 1.2 mm screen size and the +1.2 mm fraction analysed.

The samples from the 2004/05 programme were used to produce the November 2018 bauxite resource model. The tonnes and grade estimates for this 2018 Mineral Resource statement are based on the November 2018 resource model

Competent Persons

JB = John Bower, Principal Consultant, OBK Consulting Pty Ltd

Metals and Minerals
Iron Ore

Iron Ore Mineral Resources

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources 31.12.18	Measured Mineral Resources 31.12.17	Indicated Mineral Resources 31.12.18	Indicated Mineral Resources 31.12.17	Measured and Indicated Resources 31.12.18	Measured and Indicated Resources 31.12.17	Inferred Mineral Resources 31.12.18	Inferred Mineral Resources 31.12.17	Competent Person
El Aouj Mining Company S.A.												
Guelb el Aouj	50%	OC	(Mt)	400	400	1,170	1,170	1,570	1,570	300	300	AM/SvdM
East			Iron (%)	36	36	36	36	36	36	36	36	
			DTC wt (%)	45	45	45	45	45	45	45	45	
			DTC Iron (%)	69.8	69.8	69.2	69.2	69.3	69.3	69.5	69.5	
			Oxidised (Mt)	70	70	80	80	150	150	30	30	AM/SvdM
			Iron (%)	34	34	35	35	35	35	35	35	
Guelb el Aouj	50%		(Mt)	–	–	185	185	185	185	615	615	AM/SvdM
Centre			Iron (%)	–	–	34	34	34	34	35	35	
			DTC wt (%)	–	–	43	43	43	43	44	44	
			DTC Iron (%)	–	–	69.6	69.6	69.6	69.6	69.8	69.8	
			Oxidised (Mt)	–	–	–	–	–	–	45	45	AM/SvdM
			Iron (%)	–	–	–	–	–	–	33	33	
Bou Derga	50%		(Mt)	–	–	–	–	–	–	510	510	AM/SvdM
			Iron (%)	–	–	–	–	–	–	36	36	
			DTC wt (%)	–	–	–	–	–	–	43	43	
			DTC Iron (%)	–	–	–	–	–	–	69.7	69.7	
			Oxidised (Mt)	–	–	–	–	–	–	130	130	AM/SvdM
			Iron (%)	–	–	–	–	–	–	35	35	
Tintekrate	50%		(Mt)	–	–	–	–	–	–	710	710	AM/SvdM
			Iron (%)	–	–	–	–	–	–	36	36	
			DTC wt (%)	–	–	–	–	–	–	44	44	
			DTC Iron (%)	–	–	–	–	–	–	69.4	69.4	
			Oxidised (Mt)	–	–	–	–	–	–	180	180	AM/SvdM
			Iron (%)	–	–	–	–	–	–	34	34	
Total El Aouj Mining Company S.A.			**(Mt)**	**470**	**470**	**1,435**	**1,435**	**1,905**	**1,905**	**2,520**	**2,520**	
			Iron (%)	**36**	**36**	**36**	**36**	**36**	**36**	**35**	**35**	
Sphere Mauritania S.A.												
Askaf North	90%	OC	(Mt)	200	200	160	160	360	360	45	45	AM/SvdM
			Iron (%)	36	36	35	35	36	36	36	36	
			DTC wt (%)	47	47	45	45	46	46	45	45	
			DTC Iron (%)	69.8	69.8	69.4	69.4	69.6	69.6	69.2	69.2	
			Oxidised (Mt)	15	15	30	30	45	45	15	15	AM/SvdM
			Iron (%)	35	35	35	35	35	35	35	35	
Askaf Centre	90%	OC	(Mt)	–	–	–	–	–	–	95	95	AM/SvdM
			Iron (%)	–	–	–	–	–	–	36	36	
			DTC wt (%)	–	–	–	–	–	–	42	42	
			DTC Iron (%)	–	–	–	–	–	–	69.9	69.9	
			Oxidised (Mt)	–	–	–	–	–	–	13	13	AM/SvdM
			Iron (%)	–	–	–	–	–	–	37	37	
Askaf East	90%	OC	(Mt)	–	–	–	–	–	–	70	70	AM/SvdM
			Iron (%)	–	–	–	–	–	–	35	35	
			DTC wt (%)	–	–	–	–	–	–	42	42	
			DTC Iron (%)	–	–	–	–	–	–	70.3	70.3	
			Oxidised (Mt)	–	–	–	–	–	–	13	13	AM/SvdM
			Iron (%)	–	–	–	–	–	–	31	31	
Total Sphere Mauritania S.A.			**(Mt)**	**215**	**215**	**190**	**190**	**405**	**405**	**251**	**251**	
			Iron (%)	**36**	**36**	**35**	**35**	**36**	**36**	**35**	**35**	
Sphere Lebtheinia S.A.												
Lebtheinia	100%		(Mt)	–	–	2,180	2,180	2,180	2,180	350	350	AM/SvdM
Centre			Iron (%)	–	–	32	32	32	32	32	32	
			DTC wt (%)	–	–	27	27	27	27	27	27	
			DTC Iron (%)	–	–	68.6	68.6	69.6	68.6	68.1	68.1	
			LOZ (Mt)	–	–	–	–	–	–	210	210	AM/SvdM
			Iron (%)	–	–	–	–	–	–	31	31	
Total Sphere Lebtheinia S.A.			**(Mt)**	**–**	**–**	**2,180**	**2,180**	**2,180**	**2,180**	**560**	**560**	
			Iron (%)	**–**	**–**	**32**	**32**	**32**	**32**	**32**	**32**	

Metals and Minerals Iron Ore

Name of operation	Attributable interest	Mining method	Commodity	Measured Mineral Resources 31.12.18	Measured Mineral Resources 31.12.17	Indicated Mineral Resources 31.12.18	Indicated Mineral Resources 31.12.17	Measured and Indicated Resources 31.12.18	Measured and Indicated Resources 31.12.17	Inferred Mineral Resources 31.12.18	Inferred Mineral Resources 31.12.17	Competent Person
Jumelles Limited												
Zanaga	50%	OC	(Mt)	2,300	2,300	2,500	2,500	4,800	4,800	2,100	2,100	MT
			Iron (%)	34	34	30	30	32	32	31	31	

Iron Ore Reserves

Name of operation	Attributable interest	Mining method	Commodity	Proved Ore Reserves 31.12.18	Proved Ore Reserves 31.12.17	Probable Ore Reserves 31.12.18	Probable Ore Reserves 31.12.17	Total Ore Reserves 31.12.18	Total Ore Reserves 31.12.17	Competent Person
El Aouj Mining Company S.A.										
Guelb el Aouj East	50%	OC	Ore (Mt)	380	380	551	551	931	931	NS
			Iron (%)	35	35	35	35	35	35	
			DTC wt (%)	44	44	43	43	44	44	
			DTC Iron (%)	69.6	69.6	69.0	69.0	69.2	69.2	
Jumelles Limited	50%									
Zanaga		OC	Ore (Mt)	770	770	1,290	1,290	2,070	2,070	GB
			Iron (%)	37	37	32	32	34	34	

Notes

All Mineral Resources are considered suitable for open cut extraction.

DTC wt (%) – Davis Tube Concentrate mass recovery.

DTC Iron (%) – Davis Tube Concentrate assay %Fe.

Davis Tube test work has been conducted at a grind size of 95% passing 80 micron.

The rounding used for the values in this report reflects the confidence in the different levels of Mineral Resource and Ore Reserve classifications.

No exploration activities were carried out in the reporting period.

El Aouj Mining Company: Glencore holds a 50% interest in the El Aouj Mining Company through a Joint Venture arrangement with SNIM.

Guelb el Aouj East: The "Guelb" deposits are hosted in Banded Iron Formations (BIF) within the Dorsale Reguibat, an uplifted part of the Archaean West African Craton, which dominates the northern third of Mauritania's surface geology. Recrystallisation and aggregation of the magnetite grains in BIF has resulted in the partial to total destruction of the original banded (bedding) texture to produce the Guelb el Aouj magnetite-quartzite deposits. The geological sequence is overprinted by a reasonably uniform, approximately 80m thick weathered zone in which much of the magnetite has oxidised to hematite.

In 2018, the FEED phase of the development programme was completed. The project is based on the production of 11.3Mtpa of sinter feed product derived from fresh magnetite ore, beneficiated to product 66.5% iron content concentrate. The FEED phase has provided a firm and costed project implementation plan, and options to further enhance the project's viability.

Mineral resources and ore reserves are unchanged compared to previous reporting periods. The long term IODEX65 pricing for ore reserves modelling is $90/dmt CFR North China.

This resource uses a cut-off grade of 20% DTC wt% for fresh (unoxidised) mineralisation and a cut-off grade of 20% head Fe for oxidised mineralisation. All reported concentrate grades were weighted by DTC wt%.

Guelb el Aouj Centre: The El Aouj Centre magnetite-quartzite (MQ) deposit is a highly metamorphosed banded iron formation (meta-BIF) unit that ranges in true thickness from 50m to over 200m. The geometry of the deposit is defined by a tight synformal structure with a sub-vertical axial plane. The synform outcrops over a strike length of about 2.4km. The thickest accumulation of magnetite-quartzite is found along the western limb of the synform, pinching out towards the east. A series of stacked recumbent isoclinal folds probably controlled the overall geometry of the deposit. The original bedding has been partially to completely obliterated by recrystallisation, resulting in a coarse-grained texture with aggregated magnetite grains. The weathered zone, though variable, has an average vertical thickness of approximately 40m. In this zone partial to complete oxidation of magnetite to hematite has occurred.

This resource uses a cut-off grade of 20% DTC wt% for fresh (unoxidised) mineralisation and a cut-off grade of 20% head Fe for oxidised mineralisation. All reported concentrate grades were weighted by DTC wt%.

Bou Derga: The Bou Derga deposit forms part of a larger scale synformal structure defined by an Archean magnetite-quartzite (MQ) unit that ranges in true thickness from approximately 20m to 200m. The thicker parts of the deposit are considered to be a result of isoclinal folding. Drilling was restricted to the western fold closure. The deposit dips towards the northeast at about 60°. The deposit contains a number of internal waste bands (typically 5m to 50m thick) which have been modelled separately and excluded from the Mineral Resource estimation. A northwest-southeast trending fault displaces the mineralisation in the south-eastern part of the deposit.

This resource uses a cut-off grade of 20% DTC wt% for fresh (unoxidised) mineralisation and a cut-off grade of 20% head Fe for oxidised mineralisation. All reported concentrate grades were weighted by DTC wt%.

The Bou Derga Mineral Resource Statement has been prepared in accordance with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the JORC Code, 2004 Edition).

Tintekrate: The Tintekrate deposit is hosted within the Dorsale Reguibat, an uplifted part of the Archaean West African Craton, which dominates the northern third of Mauritania's surface geology. Recrystallisation and aggregation of the magnetite grains in the meta-banded iron formation (BIF)

units has resulted in partial to total destruction of the original banded (bedding) texture to produce the Tintekrate and other similar magnetite-quartzite deposits. The Tintekrate deposit is a circular structure defined by a steep dipping MQ unit with dips of 50° to 80° (locally overturned) with true mineralised thicknesses of 100m to 150m on the western side of the structure to 50m to 100m on the eastern side. The weathered zone averages 70m to 75m vertical depth below natural surface and its base tends to mirror the natural surface profile. In this zone, magnetite has been partially to completely oxidised to hematite.

This resource uses a cut-off grade of 20% DTC wt% for fresh (unoxidised) mineralisation and a cut-off grade of 20% head Fe for oxidised mineralisation. All reported concentrate grades were weighted by DTC wt%.

Askaf North: Askaf North Deposit is an east-west striking synformal structure defined by a magnetite-quartzite (MQ) unit that ranges in true thickness from approximately 140m in the western hinge zone to approximately 30m along the eastern part of the southern limb. The synformal axis plunges at between 20° to 30° towards the east in the western part of the synform, and at about 35° to 45° towards the west at the eastern fold closure, producing a double plunging synform. A dolerite dyke has been emplaced along an east-west fault zone that displaces the northern part of the deposit in a dextral shear sense. The disruption and emplacement of the dolerite along the northern limb of the synform has not affected the quality of the mineralisation. The MQ unit represents a metamorphosed banded iron-formation (BIF). The precursor BIF was subjected to high-grade metamorphic conditions during the Archaean, which resulted in complete recrystallisation of the original fine-grained BIF. In most cases the primary textures have been destroyed by the recrystallisation. Coarse-grained (>1mm) MQ is produced as a result, with good Davis Tube liberation characteristics and concentrate grades at a liberation grind size of 95% passing 80 micron.

The Askaf North Mineral Resource Statement uses a cut-off grade of 20% DTC wt% for fresh (unoxidised) mineralisation and a cut-off grade of 20% head Fe for oxidised mineralisation. All reported concentrate grades were weighted by DTC wt%.

Askaf Centre: The Askaf Centre deposit comprises a northern body that is exposed over a strike length of 3.5km and a southern body that is exposed over a strike length of 1.7km. Both bodies form part of a regional scale antiformal structure and each body is also duplicated within itself by outcrop-scale tight isoclinal folding. The northern and southern bodies are separated and displaced in a dextral shear sense by a regional scale fault/fracture system. The northern body is generally sub-vertical striking roughly northwest-southeast. The magnetite-quartzite unit ranges in thickness from approximately 50m in the west to approximately 70m in the east, with the magnetite-quartzite mineralisation being thinnest in the steep dipping middle portion (±10 m). The multiple layers reported is the result of tight isoclinal folding. The southern body comprises an open synformal structure with an undulating sub-horizontal fold axis that plunges at approximately 25° towards the southwest at the southern part of the deposit. At this locality the mineralisation is still open-ended at depth. The two limbs of the synform are exposed over a strike length of approximately 1km. The northern part of the synform is tighter than is the case in the south, with the eastern limb almost being overturned in some places. Magnetite-quartzite ranges in thickness from approximately 30m to 35m in the limbs to approximately 45m to 55m in the synformal keel as a result of structural thickening with thicknesses of up to 90m reported. The magnetite-quartzite unit is embedded within an Archaen granitic/gneiss sequence. The weathered zone which, though variable, has an average vertical thickness of approximately 40m and in this zone partial to complete oxidation of magnetite to hematite has occurred. Oxidation significantly reduces the Davis Tube mass recovery (wt%) in mineralised drill samples.

This resource uses a cut-off grade of 20% DTC wt% for fresh (unoxidised) mineralisation and a cut-off grade of 20% head Fe for oxidised mineralisation. All reported concentrate grades were weighted by DTC wt%.

Askaf East: The Askaf East deposit occupies the southern limb of an apparent east-west striking synformal structure defined by an Archaean magnetite-quartzite unit that ranges in true thickness from approximately 20m at the western end of the limb to approximately 140m in the central part of the limb. The hinge zone is at the eastern end of the deposit. The synformal axis plunges about 40° towards the west in the eastern part of the synform. The thickening of the sequence in the eastern part of the deposit is probably as a result of isoclinal folding within the sequence. The MQ unit is embedded within an Archaen granitic/gneiss sequence. The weathered zone, though variable, has an average vertical thickness of approximately 40m. Partial to complete oxidation of magnetite to hematite has occurred in this zone and this significantly reduces the Davis Tube mass recovery (wt%) in mineralised drill samples.

This resource uses a cut-off grade of 20% DTC wt% for fresh (unoxidised) mineralisation and a cut-off grade of 20% head Fe for oxidised mineralisation. All reported concentrate grades were weighted by DTC wt%.

Lebtheinia: The magnetite-rich Banded Iron Formations (BIF) at Lebtheinia form part of the Archaean Lebzena Group. The BIF units in EL264 are exposed over a total strike length of approximately 24km, of which Lebtheinia Centre has a strike length of 11.5km. Parts of the main BIF units at Lebtheinia Centre deposit are covered by laterite and colluvium consisting of BIF fragments.

The magnetite-BIF at Lebtheinia Centre averages about 240m thick. The BIF is characterised by a well-defined banding pattern, with individual bands ("mesobands") averaging 5-10mm thick. Drilling shows that mineralisation extends to at least 400m vertically below natural surface and is open at depth. The deposit is intruded by a series of sub-vertical dolerite dykes, striking NE-SW to NNE-SSW. Lebtheinia Centre has a hanging wall of (variously) quartzite, amphibolite, rhyolite, clay/saprolite (altered amphibolite) and a footwall of quartzite or amphibolite.

The depth of weathering (oxidation) of the BIF averages around 50m. In the lower two thirds of the oxidised zone (the Lower Oxidised Zone, "LOZ") the degree of oxidation is less than in the more oxidised upper third.

The Lebtheinia Centre Mineral Resource Statement for fresh mineralisation uses 20% DTC wt% cut-off. For the LOZ unit the cut-off is 14 SI x 10-3 units of magnetic susceptibility.

The Lebtheinia Mineral Resource Statement has been prepared in accordance with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the JORC Code, 2004 Edition).

Zanaga Project: The Zanaga ELs are located within a north-south oriented greenstone belt which extends for over 47km in length, and vary between 0.5km and 3km in width. The

mineralisation is hosted by metamorphosed volcano-sedimentary itabirites, and is interbedded with amphibolites and mafic schists. The contact with the crystalline basement is typically faulted and sheared. The principal ore lithologies consist of itabirites, interbedded with basic lavas, which are later altered to amphibolites. Typically, the itabirites consist of layers of iron-rich and quartz rich meta-sediments, on a millimetre to centimetre scale. The orebody lithologies are crosscut by late intrusions and dolerite dykes, oriented northeast-southwest. The deposit comprises a sequence of weathering domains, which overlay an un-weathered protore comprising itabirite. The weathered sequence observed at Zanaga is typical of iron ore deposits, where the surficial material demonstrates enrichment in iron above the protore due to a mass reduction and associated leaching of the silicate layers.

The Mineral Resource is reported at a 0% Fe cut-off.

The Zanaga Mineral Resource Statement has been prepared in accordance with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the JORC Code, 2012 Edition).

The Zanaga Project Ore Reserve Statement was prepared by SRK Consulting (UK) Limited as part of a Feasibility Study.

The full release of this Mineral Resource and Ore Reserve update is available on the Zanaga Iron website (www.zanagairon.com).

Competent Persons

AM = Alan Miller, Independent Consultant (MAusIMM (CP)), responsible for the construction of the geological block model, the grade interpolation and the Mineral Resource estimation (tonnage and grade) and classification.

GB = Gabor Bacsfalusi, SRK Consulting (UK) Limited (MAusIMM (CP)).

MT = Malcolm Titley, CSA Global (UK) Ltd (MAusIMM (CP)).

NS = Nicolas Szwedska, BBA Inc. (OIQ).

SvdM = Schalk van der Merwe, Independent Consultant (SACNSP), responsible for the geological interpretation for the Mineral Resource estimation (wireframe model), and the drill hole data set used in these resource estimation.

Energy Products
Coal

Australia Coal Resources – New South Wales

Name of operation	Attributable interest	Mining Method	Commodity	Measured Coal Resources 31.12.18	Measured Coal Resources 31.12.17	Indicated Coal Resources 31.12.18	Indicated Coal Resources 31.12.17	Inferred Coal Resources 31.12.18	Inferred Coal Resources 31.12.17	Competent Person
Oakbridge Group			Thermal Coal (Mt)	**1,034**	**1,034**	**633**	**633**	**1,530**	**1,530**	
Bulga Complex	68.3%	OC/UG	Thermal Coal (Mt)	1,000	1,000	560	560	1,300	1,300	JT
			CV (kcal/kg)	5,900	5,900	5,600	5,600	5,700	5,700	
Baal Bone	74.1%	OC/UG	Thermal Coal (Mt)	15	15	13	13	80	80	MS
			CV (kcal/kg)	5,800	5,800	6,350	6,350	5,000	5,000	
Running Stream	78%	OC/UG	Thermal Coal (Mt)	19	19	60	60	150	150	MS
			CV (kcal/kg)	5,050	5,050	5,050	5,050	5,150	5,150	
Macquarie Coal JV	80%		Thermal Coal (Mt)	**42**	**42**	**107**	**107**	**30**	**30**	
West Wallsend		UG	Thermal Coal (Mt)	40	40	12	12	–	–	MS
			CV (kcal/kg)	5,350	5,350	5,450	5,450	–	–	
Cardiff Borehole		UG	Thermal Coal (Mt)	–	–	15	15	30	30	MS
			CV (kcal/kg)	–	–	5,800	5,800	5,500	5,500	
Teralba		UG	Thermal Coal (Mt)	2	2	80	80	–	–	MS
			CV (kcal/kg)	6,000	6,000	6,100	6,100	–	–	
Mitchells Flat	100%	OC/UG	Thermal Coal (Mt)	–	–	**120**	**120**	**350**	**350**	JW
			CV (kcal/kg)	–	–	5,750	5,750	5,900	5,900	
Liddell	67.5%	OC/UG	Thermal Coal (Mt)	**160**	**170**	**200**	**200**	**400**	**400**	ST/ML
			CV (kcal/kg)	6,150	6,200	6,100	6,100	6,200	6,200	
Mount Owen Complex	100%		Thermal Coal (Mt)	**305**	**320**	**296**	**296**	**441**	**441**	
Mount Owen		OC	Thermal Coal (Mt)	180	190	220	220	350	350	ML
			CV (kcal/kg)	6,000	6,050	6,100	6,200	6,050	6,050	
Ravensworth East		OC	Thermal Coal (Mt)	65	65	26	26	1	1	ML
			CV (kcal/kg)	5,750	5,750	5,700	5,700	5,750	5,750	
Glendell		OC	Thermal Coal (Mt)	60	65	50	50	90	90	ML
			CV (kcal/kg)	5,900	5,900	5,900	5,900	5,850	5,850	
Integra	100%	UG	Thermal/Coking Coal (Mt)	**14**	**17**	**55**	**50**	**40**	**40**	MS
			CV (kcal/kg)	5,800	5,400	5,900	5,450	5,950	5,400	
United	95%	OC/UG	Thermal Coal (Mt)	**240**	**240**	**250**	**250**	**600**	**600**	IE
			CV (kcal/kg)	6,000	6,000	6,000	6,000	5,550	5,550	
Ulan Complex	90%		Thermal Coal (Mt)	**245**	**255**	**323**	**343**	**720**	**720**	
Ulan UG		UG	Thermal Coal (Mt)	200	210	310	330	700	700	ML
			CV (kcal/kg)	6,500	6,600	4,800	4,750	5,000	5,000	
Ulan OC		OC	Thermal Coal (Mt)	45	45	13	13	20	20	ML
			CV (kcal/kg)	4,950	4,950	5,200	5,200	4,900	4,900	
Ravensworth Group			Thermal Coal (Mt)	**414**	**434**	**240**	**250**	**100**	**100**	
Narama	100%	OC	Thermal Coal (Mt)	24	24	–	–	–	–	RS
			CV (kcal/kg)	5,600	5,600	–	–	–	–	
Ravensworth North	90%	OC	Thermal Coal (Mt)	390	410	240	250	100	100	RS
			CV (kcal/kg)	6,050	5,950	6,050	6,000	5,650	5,700	
Mangoola	100%	OC/UG	Thermal Coal (Mt)	**130**	**110**	**100**	**270**	**1,500**	**1,300**	MS
			CV (kcal/kg)	5,200	5,200	4,750	4,500	4,250	4,100	
Ravensworth UG	70%	UG	Thermal Coal (Mt)	**320**	**320**	**220**	**220**	**250**	**250**	ML
			CV (kcal/kg)	5,800	5,800	5,400	5,400	5,350	5,350	
Hunter Valley Operations	49%	OC	Thermal Coal (Mt)	704	–	1,430	–	1,654	–	See notes
			CV (kcal/kg)							
Coal Resources New South Wales			**Coking/Thermal Coal (Mt)**	**3,608**	**2,942**	**3,974**	**2,739**	**7,615**	**5,761**	

HVO reported as at 30 June 2018

Energy Products Coal

Australia Coal Reserves – New South Wales

Name of operation	Attributable interest	Mining method	Coal type	Coal Reserves Proved 31.12.18	Coal Reserves Probable 31.12.18	Marketable Coal Reserves Proved 31.12.18	Marketable Coal Reserves Probable 31.12.18	Total Marketable Coal Reserves 31.12.18	Total Marketable Coal Reserves 31.12.17	Competent Person
Oakbridge Group	68.3%		Thermal Coal (Mt)	**165**	**89**	**115**	**61**	**176**	**187**	
Bulga OC		OC	Thermal Coal (Mt)	70	65	45	45	90	100	JG
			CV (kcal/kg)			6,350	6,300	6,300	6,350	
Bulga UG		UG	Thermal Coal (Mt)	95	24	70	16	85	87	POG
			CV (kcal/kg)			6,400	6,450	6,400	6,400	
Liddell	67.5%	OC	Thermal Coal (Mt)	**16**	**8**	**10**	**5**	**15**	**18**	CG
			CV (kcal/kg)			6,750	6,700	6,750	6,700	
Mount Owen Complex	100%		Thermal Coal (Mt)	**94**	**20**	**55**	**11**	**66**	**58**	
Mount Owen		OC	Thermal Coal (Mt)	70	20	40	11	51	40	STH
			CV (kcal/kg)			6,350	6,350	6,350	6,350	
Ravensworth East		OC	Thermal Coal (Mt)	8	-	5	-	5	6	STH
			CV (kcal/kg)			6,100	-	6,100	6,000	
Glendell		OC	Thermal Coal (Mt)	16	-	10	-	10	12	STH
			CV (kcal/kg)			6,500	-	6,500	6,600	
Integra	100%	UG	Coking Coal (Mt)	**4**	**7**	**3**	**5**	**8**	**3**	AF
			Ash (%)			9	9	9	9	
United OC	95%	OC	Thermal Coal (Mt)	**-**	**70**	**-**	**50**	**50**	**50**	PP
			CV (kcal/kg)			-	6,500	6,500	6,500	
Ulan Complex	90%		Thermal Coal (Mt)	**146**	**6.4**	**134**	**6**	**140**	**154**	
Ulan #3 UG		UG	Thermal Coal (Mt)	55	-	50	-	50	55	EM
			CV (kcal/kg)			6,350	-	6,350	6,350	
Ulan West UG		UG	Thermal Coal (Mt)	85	6	80	6	86	95	HE
			CV (kcal/kg)			6,250	6,250	6,250	6,250	
Ulan Waratah OC		OC	Thermal Coal (Mt)	6	0.4	4	0.2	4	4	VC
			CV (kcal/kg)			5,000	5,000	5,000	5,000	
Ravensworth North	90%	OC	Thermal Coal (Mt)	**200**	**12**	**140**	**8**	**148**	**148**	DC
			CV (kcal/kg)			6,250	6,300	6,250	6,400	
Mangoola	100%	OC	Thermal Coal (Mt)	**75**	**30**	**60**	**24**	**84**	**68**	MW
			CV (kcal/kg)			5,400	5,400	5,400	5,350	
Ravensworth UG	70%	UG	Thermal Coal (Mt)	**40**	**-**	**28**	**-**	**28**	**28**	KB
			CV (kcal/kg)			6,950	-	6,950	6,950	
Hunter Valley Operations	49%	OC	Thermal Coal (Mt)	**333**	**463**	**229**	**325**	**554**	–	See notes
			CV (kcal/kg)							
Coal Reserves New South Wales			**Thermal Coal (Mt)**	**1,069**	**698**	**771**	**490**	**1,261**	**711**	
			Coking Coal (Mt)	**4**	**7**	**3**	**5**	**8**	**3**	

Note: Hunter Valley Semisoft coking coal is included in Thermal Coal (Mt)

HVO reported as at 30 June 2018

Energy Products Coal

Notes

The New South Wales Coal Resources and Reserves are contained within the Sydney Basin.

Changes and issues material to the estimation of Coal Resources and Reserves are noted below for specific projects. Reference to production changes between 31 December 2017 and 31 December 2018 are detailed for each producing mine site.

Unless otherwise stated, tenement expiries will be eligible for a standard renewal as per the relevant Government policy.

Tonnages are quoted as million metric tonnes.

Oakbridge Group

Bulga open cut: Coal Resource and Reserve depletion due to mining (-12Mt).

Coal Reserves for Bulga Open Cut operations are sufficient to support a mine life of approximately 18 years.

Bulga underground: Coal Resource and Reserve depletion due to mining (-1.4Mt). Blakefield South operation closed. No active UG mining on site.

Tenements for the Bulga Complex expire between December 2018 and September 2036. Some tenements are undergoing a routine renewal process with the NSW Government.

Baal Bone: Coal Resources were not re-estimated in 2018.

Extraction of the remaining Lithgow Seam and Irondale Seam resources expected to be by underground methods except where the Lithgow, Irondale and Glen Davis Seams are potentially extractable by open cut methods.

Tenements for Baal Bone expire between December 2024 and August 2032.

Running Stream: Running Stream is an undeveloped thermal coal project. Coal Resources were not re-estimated in 2018.

Potential mining methods are open cut for the shallow Coal Resources (less than 60m depth of cover) and underground mining for Coal Resources in excess of 60m depth of cover.

Assessment Lease expires in May 2020.

Macquarie JV

West Wallsend: Coal Resources were not re-estimated in 2018.

West Wallsend Mine completed operations in 2016 and mine closure work has commenced. Tenements for West Wallsend, Cardiff Borehole and Teralba expire between January 2020 and January 2030. Some tenements are undergoing a routine renewal process with the NSW Government.

Cardiff Borehole: Coal Resources were not re-estimated in 2018.

Cardiff Borehole is an underground Coal Resource possibly accessible via the existing Teralba Colliery infrastructure.

Teralba: Coal Resources were not re-estimated in 2018.

Teralba was a longwall underground that ceased operations in 2001. The Coal Resource remains suitable for a potential underground mine.

Mitchells Flat: Coal Resources were not re-estimated in 2018.

Tenements for Mitchells Flat expire in February 2019.

Liddell Open Cut: Coal Resources include both the current Liddell Open Cut Operations and a project called Glendell North Project. Each area has been assessed by a different Competent Person; Liddell Open Cut by Shaun Tamplin and Glendell North by Mark Laycock.

Coal Reserve depletion due to mining at Liddell Open Cut (-5Mt).

Tenements for Liddell expire between October 2023 and November 2028. Coal Reserves for Liddell operations are sufficient to support the planned mine life of 5 years.

Coal Resource decrease due to removal of sterilised mining section (-3.5Mt).

Tenements for Glendell North Project expire between July 2020 and December 2023.

Mt Owen Complex

Mount Owen: Coal Resource and Reserve depletion due to mining (-7Mt).

Coal Reserve increase due to a new mine extension in the Mount Owen Continued Operations Project (MOCO Modification 2 Project Area) (+32mt).

Tenements for Mt Owen expire between December 2018 and July 2036. Some tenements are undergoing a routine renewal process with the NSW Government.

Coal Reserves for Mt Owen Operations are sufficient to support the planned mine life of 17 years.

Ravensworth East: Coal Resource and Reserve depletion due to mining (-1Mt) and sterilization (-0.8Mt).

Tenements for Ravensworth East expire between June 2019 and October 2034.

Coal Reserves for Ravensworth East operations are sufficient to support the planned mine life of 4 years.

Glendell: Coal Resource and Reserve depletion due to mining (-4Mt).

Coal Reserve CV decreased due to the seam mix of the remaining resource when compared to previous estimate (-100kcal/kg).

Tenements for Glendell expire between July 2020 and November 2033. Coal Reserves for Glendell operations are sufficient to support the planned mine life of 4 years.

Integra: Coal Resource and Reserve depletion due to mining (-2Mt).

Coal Reserve increase due to the inclusion of additional contiguous mining area following completion of an exploration program (+8Mt). A number of discrepancies identified in reporting of coal quality identified in 2017 estimate have been corrected in this estimate.

Tenements for the area expire between November 2023 and November 2033. Coal Reserves for Integra operations are sufficient to support the planned mine life of 5 years.

Hunter Valley Operations: Newly acquired asset.

The reported information is taken from the information supplied by Yancoal (51% majority shareholder in the Hunter Valley Operations Joint Venture) to the Hong Kong stock exchange. This information along with a Competent Person's report prepared by RPM Global, can be found on the Yancoal website:
<https://www.yancoal.com.au/page/en/investors/hong-kong-listing-documents/>
in a series of documents entitled "Prospectus (English) part 1 of 5" to "Prospectus (English) Part 5 of 5". Glencore is a

49% owner in the Hunter Valley Operations Joint Venture. The website also indicates that the same information is supplied in Chinese in 3 volumes. This report does not tabulate the energy values for the various Resource and Reserve sub-categories. Hence values for this are not included in this report, but will be in future periods.

Tenements for Hunter Valley Operations expire between April 2019 and December 2035. Some tenements are undergoing a routine renewal process with the NSW Government. Coal Reserves at Hunter Valley Operation are sufficient to support the planned mine life of 30 years.

United: No change in Coal Resource or Reserve estimations since 31 December 2017.

Tenements for United expire between August 2019 and March 2033. Some tenements are undergoing a routine renewal process with the NSW Government.

United Open Cut Project: No material change to Coal Reserves estimations since 31 December 2017.

Coal Reserves for United Open Cut Project are sufficient to support a planned mine life of 14 years.

Ulan Complex: Coal Resource decrease due to sterilisation (-18Mt) of the upper part of the mining section as mining occurred in the lower part. The lower part of the mining section was depleted (-11Mt) as a direct result of mining.

Tenements for Ulan expire between May 2020 and June 2038. Some tenements are undergoing a routine renewal process with the NSW Government.

Ulan Open Cut: No mining during reporting period therefore no material change to Coal Reserves estimations since 31 December 2017.

Ulan West Underground: Coal Reserve depletion due to mining (-7Mt).

Coal Reserve increase due to mine plan variation (+1.3Mt).

Coal Reserves for Ulan West underground operations are sufficient to support the planned mine life of 13 years.

Ulan #3 Underground: Coal Reserve depletion due to mining (-4Mt).

Coal Reserve increase due to mine plan variation (+0.4Mt).

Coal Reserves for Ulan #3 underground operations are sufficient to support the planned mine life of 10 years.

Ravensworth Group

Narama: No material change to Coal Resources since 31 December 2017. Mining Operations in Narama ceased at the end of 2014 upon completion of the Narama mine plan.

Tenements for Narama expire between December 2023 and August 2036.

Ravensworth North: Coal Resource and Reserve depletion due to mining (-14.5Mt).

Coal reserve increase due to adjustments to aggregation cut-off thicknesses and recovery of coal around base of weathering (+3.6Mt).

Increase in Marketable Reserves due to domestic bypass and Froth Flotation RCP circuit installed and modelled to give an overall yield improvement (+6.6Mt).

Coal Reserve CV decrease due to Bayswater Coal bypass and modelled product increases of Lower Lemington seams (-160kcal/kg).

Tenements for Ravensworth North expire between June 2022 and September 2035. Some tenements are undergoing a routine renewal process with the NSW Government. Coal Reserves for Ravensworth North operations are sufficient to support the planned mine life of 16 years.

Mangoola: Coal Resource and Reserve depletion due to mining (-12Mt).

Changes to Resource estimations outside of pit shells include:

- Decrease in Measured and Indicated Coal Resource due to review of JORC polygon classifications (-139Mt), +9Mt of this was reallocated to inferred. CV of Indicated Coal Resource increased as poorer CV & ash Indicated tonnes were reclassified as Inferred (+257kcal/kg).
- Increase in Inferred Coal Resource by remodelling for Mangoola North, removal of stone partings increased the CV and decreased the Ash (+145kcal/kg, -2% ash), allowing more resources to be included in the 50% ash cut-off (+135Mt).

Reduction of Coal Reserves due to the exclusion of the lower CV reserves in ML1626 beneath the high voltage power line, known as the Power line Pit (-10Mt), along with the inclusion of higher CV reserves in AL9 & EL5552 (+44mt), resulted in an increase in Coal Reserve CV (+250kcal/kg).

Increase of Coal Reserve due to inclusion of Mangoola North reserves in AL9 & EL5552 (+35.5Mt).

Tenements for Mangoola expire between November 2019 and December 2037. Coal Reserves for Mangoola operations are sufficient to support the planned mine life of 10 years.

Ravensworth Underground: No material change in Coal Resource or Reserve estimations since 31 December 2017.

Production was suspended in September 2014 with the mine currently on care and maintenance.

Tenements for Ravensworth Underground expire between November 2021 and November 2029. Some tenements are undergoing a routine renewal process with the NSW Government.

Portfolio changes: Tahmoor was sold to GFG Alliance in April 2018.

Competent Persons

AF = Alison Freeman, Senior Mining Engineer, Glencore Coal Assets Australia (AusIMM);

CG = Chris Gerard, Technical Services Manager, Liddell Coal (AusIMM);

DC = David Cahill, Senior Mining Engineer, Ravensworth Open Cut (AusIMM);

EM = Ed McGonigle, Senior Mining Engineer, Ulan Underground (AusIMM);

HE = Heath Evans, Technical Services Manager, Ulan West Underground (AusIMM);

IE = Isaac Eadndel, Geologist, Glencore Coal Assets Australia (AusIMM);

JG = Joel Grant, Senior Mining Engineer, Bulga Open Cut (AusIMM);

JT = John Terrill, Principal Resource Geologist, Glencore Coal Assets Australia (AIG);

JW = Jamie Walters, Senior Geologist, Glencore Coal Assets Australia (AusIMM);

KB = Konrad Bawelkiewicz, Mining Engineer, Glencore Coal Assets Australia (AusIMM);

ML = Mark Laycock, Geology Superintendent, Glencore Coal Assets Australia (AusIMM);

MS = Michael Stadler, Senior Geologist, Glencore Coal Assets Australia (AusIMM);

MW = Mark Williams, Technical Services Manager, Mangoola Open Cut (AusIMM);

POG = Paul O'Grady, Group Manager, Technical Services, Glencore Coal Assets Australia (AusIMM);

PP = Phuc Pham, Mining Engineer, United Colliery (AusIMM);

RS = Reece Stewart, Geologist, formerly Ravensworth Open Cut (AusIMM);

SH = Shane Holmes, Technical Services Manager, Glencore Coal Assets Australia (AusIMM);

ST = Shaun Tamplin, formerly Principal Consultant, TREX Resources Pty Ltd (now Glencore Coal Assets Australia) (AusIMM);

VC = Vrotnesky Cediel, Technical Services Superintendent, Ulan Surface Operations (AusIMM).

Energy Products Coal

Australia Coal Resources – Queensland

Name of operation	Attributable interest	Mining Method	Commodity	Measured Coal Resources 31.12.18	Measured Coal Resources 31.12.17	Indicated Coal Resources 31.12.18	Indicated Coal Resources 31.12.17	Inferred Coal Resources 31.12.18	Inferred Coal Resources 31.12.17	Competent Person
Oaky Creek	55%	OC/UG	Coking Coal (Mt)	**250**	**260**	**340**	**340**	**80**	**80**	RH
Red Rock	75%	OC/UG	Coking/Thermal Coal (Mt)	**1**	**1**	**250**	**150**	**200**	**150**	RH
			CV (kcal/kg)	6,950	6,950	5,300	6,000	5,150	5,700	
NCA	100%		Coking/Thermal Coal (Mt)	**466**	**467**	**563**	**513**	**1,030**	**1,000**	
Newlands, Suttor		OC/UG	Thermal Coal (Mt)	310	310	150	120	400	400	JT
Eastern (RCM)			CV (kcal/kg)	5,750	5,700	5,200	5,400	5,050	5,100	
Wollombi (MCM)		OC/UG	Coking Coal (Mt)	10	10	55	25	90	50	JT
			Thermal Coal (Mt)	16	17	60	60	90	90	
			CV (kcal/kg)	5,300	5,300	5,250	5,000	5,150	5,000	
Sarum		OC/UG	Coking Coal (Mt)	30	30	8	8	60	60	JT
			Thermal Coal (Mt)	-	–	65	65	250	250	
			CV (kcal/kg)	-	–	5,450	5,450	4,650	4,650	
Collinsville		OC/UG	Coking Coal (Mt)	35	30	75	75	40	40	RH
			Thermal Coal (Mt)	65	70	150	160	100	110	
			CV (kcal/kg)	5,300	5,350	6,000	6,200	5,500	5,450	
Cook	95%	OC/UG	Coking/Thermal Coal (Mt)	**–**	**–**	**210**	**210**	**800**	**800**	JT
			CV (kcal/kg)	–	–	6,650	6,650	6,500	6,500	
Rolleston	75%		Thermal Coal (Mt)	**210**	**210**	**210**	**210**	**420**	**420**	
Rolleston ML		OC	Thermal Coal (Mt)	210	210	210	210	400	400	JB
			CV (kcal/kg)	5,750	5,750	5,550	5,550	5,550	5,550	
Rolleston MDL &		OC	Thermal Coal (Mt)	–	–	–	–	20	20	JB
EPCs			CV (kcal/kg)	–	–	–	–	5,700	5,400	
Togara North	70%	OC/UG	Thermal Coal (Mt)	**370**	**370**	**250**	**250**	**700**	**700**	MS
			CV (kcal/kg)	6,350	6,350	6,000	6,000	6,000	6,000	
Wandoan	75%		Thermal Coal (Mt)	**1,500**	**1,500**	**1,950**	**1,950**	**4,600**	**4,600**	RJ
			CV (kcal/kg)	5,200	5,200	5,100	5,100	5,050	5,050	
Milray	75%	OC/UG	Thermal Coal (Mt)	**–**	**–**	**170**	**170**	**600**	**600**	RH
			CV (kcal/kg)	–	–	6,050	6,050	4,950	4,950	
Pentland	75%	OC/UG	Thermal Coal (Mt)	**100**	**100**	**40**	**40**	**10**	**10**	RH
			CV (kcal/kg)	4,400	4,400	4,050	4,050	4,100	4,100	
Clermont	25%	OC	Thermal Coal (Mt)	**90**	**110**	**18**	**18**	**5**	**10**	JT
			CV (kcal/kg)	6,200	6,200	6,050	6,050	5,600	5,800	
Hail Creek	82%		Coking/Thermal Coal (Mt)	**150**	**–**	**710**	**–**	**90**	**–**	
Hail Creek		OC/UG	Coking/Thermal Coal (Mt)	150	–	590	–	20	–	LP
Operations			CV (kcal/kg)	–	–	–	–	–	–	
Lake Elphinstone		OC/UG		–	–	120	–	40	–	JT
				–	–	–	–	–	–	
Mount Robert		OC/UG		–	–	–	–	30	–	LP
				–	–	–	–	–	–	
Valeria	71%	OC	Thermal Coal (Mt)	**–**	**–**	**700**	**–**	**60**	**–**	JT
			CV (kcal/kg)	–	–	–	–	–	–	
Coal Resources Queensland			**Coking/Thermal Coal (Mt)**	**3,157**	**3,008**	**5,401**	**3,851**	**8,595**	**8,370**	

Energy Products Coal

Australia Coal Reserves – Queensland

Name of operation	Attributable interest	Mining method	Coal type	Coal Reserves Proved 31.12.18	Coal Reserves Probable 31.12.18	Marketable Coal Reserves Proved 31.12.18	Marketable Coal Reserves Probable 31.12.18	Total Marketable Coal Reserves 31.12.18	Total Marketable Coal Reserves 31.12.17	Competent Person
Oaky Creek	55%		Coking Coal (Mt)	**50**	**22**	**35**	**13**	**45**	**51**	
Oaky North		UG	Coking Coal (Mt)	50	22	35	13	45	51	SW
			Ash (%)			9.4	9.4	9.4	9.4	
NCA	100%		Coking/Thermal Coal (Mt)	**76**	**75**	**58**	**56**	**116**	**124**	
Newlands OC		OC	Coking Coal (Mt)	5	3	3	2	5	6	AC
			Ash (%)			9	9	9	10	
		OC	Thermal Coal (Mt)	35	15	27	10	35	40	
			CV (kcal/kg)			6,450	6,250	6,400	6,400	
Collinsville OC		OC	Coking Coal (Mt)	10	12	7	9	16	16	AC
			Ash (%)			10	10	10	10	
		OC	Thermal Coal (Mt)	26	45	21	35	60	62	
			CV (kcal/kg)			5,850	6,050	5,950	5,950	
Rolleston	75%	OC	Thermal Coal (Mt)	**150**	**70**	**150**	**70**	**220**	**230**	RM
			CV (kcal/kg)			5,700	5,450	5,600	5,600	
Togara North	70%	OC	Thermal Coal (Mt)	**–**	**28**	**–**	**28**	**28**	**28**	PJ
			CV (kcal/kg)			6,300	6,300	6,300	6,300	
Wandoan	75%	OC	Thermal Coal (Mt)	**570**	**200**	**490**	**170**	**650**	**660**	PJ
			CV (kcal/kg)			5,600	5,600	5,600	5,600	
Clermont	25%	OC	Thermal Coal (Mt)	**85**	**14**	**85**	**14**	**100**	**114**	HB
			CV (kcal/kg)			5,900	5,900	5,900	5,950	
Hail Creek	82%	OC	Coking/Thermal Coal (Mt)	**70**	**140**	**45**	**90**	**140**	**–**	AC
			CV (kcal/kg)							
Coal Reserves Queensland			**Thermal Coal (Mt)**	**894**	**428**	**791**	**363**	**1,149**	**1,134**	
			Coking Coal (Mt)	**107**	**121**	**72**	**78**	**150**	**73**	

Notes

The Queensland Coal Resources and Reserves are contained within the Bowen Basin, the Surat Basin and the Galilee Basin.

Changes and issues material to the estimation of Coal Resources and Reserves are noted below for specific projects. Reference to production changes between 31 December 2017 and 31 December 2018 are detailed for each producing mine site.

Tonnages are quoted as million metric tonnes (Mt).

Oaky Creek: Coal Resource depletion primarily due to mining (-5Mt) and correction of the 2017 German Creek classification polygons (-2Mt). Coal Reserve decrease due to mine design changes in longwall panels within ML70327 (-2Mt).

Coal Reserves are sufficient to support the planned mine life for 15 years. Tenements for the Oaky Creek Complex expire between June 2020 and August 2035.

Red Rock: Coal Resources include both the current Red Rock area and a new project called South Oak Park. South Oak Park Project has been assessed in a separate statement to Red Rock but is reported together in the Australia Coal Resources – Queensland Table.

South Oak Park Coal Resources estimated for the extraction of thermal and coking coal via open cut methods.

Increase of Coal Resource due to drilling undertaken in the project area Indicated (+90Mt) and Inferred (+66Mt). Currently there is no mine plan for the South Oak Park Project area. Decrease in CV of Red Rock indicated and inferred resources reflects inclusion of South Oak Park.

Tenements for Red Rock expire between March 2019 and September 2020. Some tenements are undergoing a routine renewal process with the QLD Government.

NCA

Newlands Open Cut: Coal Reserve depletion due to mining (-6Mt).

Coal Resource increase due to new drilling and re-correlation completed in the Girrah Project area (+24Mt). Inferred Coal Resource also increased due to this reason (+29Mt).

Coal Reserves for Newlands Open Cut operations are sufficient to support the planned mine life of approximately 7 years.

Newlands, Suttor, Eastern (RCM – Rangal Coal Measure): Newlands Coal Resource depletion due to mining (-1Mt).

Eastern Creek Coal Resource depletion due to mining (-1.5Mt).

Suttor Creek Coal Resource no material change since 31 December 2017.

Tenements for Newlands Complex expire between April 2021 and August 2037. Some tenements are undergoing a routine renewal process with the QLD Government.

Wollombi (MCM – Moranbah Coal Measures): Coal Resource depletion due to mining (-2Mt).

Increase of Coal Resource due to new declaration of Coal Resources from drilling undertaken in the project area (+29Mt Indicated, +32Mt Inferred).

Coal Resource CV increase due to higher energy coals being added to the resource with the new declaration of resources from project drilling (+250 kcal/kg Indicated, 150 kcal/kg inferred).

Sarum: No change in the Coal Resource estimation since 31 December 2012.

The Sarum Project is inclusive of the Sarum and Gattonvale deposits. Tenements at the Project expire between April 2021 and May 2023. An application for the grant of a new Mineral Development Licence that covers the entire project area has been lodged.

Collinsville: Coal Resource and Reserve depletion due to mining (-4Mt).

Overall Coal Resource decrease due to geological model refinements (Measured & Indicated -3Mt, Inferred -12Mt).

Coal Reserves for Collinsville are sufficient to support the planned mine life for 20 years.

Tenements for Collinsville expire between November 2019 and September 2035. Some tenements are undergoing a routine renewal process with the Queensland Government.

Cook (Blackrock): No change in the Coal Resource estimation since 31 December 2017.

Tenements for Cook expire between April 2021 and September 2028.

Rolleston: Coal Resource and Reserve depletion due to mining (-15Mt).

Upgrade of Inferred Coal Resource to Measured and Indicated due to new drilling in Rolleston South, Rolleston East and Spring Creek North (+24Mt).

Tenements for Rolleston expire between April 2020 and May 2043. Some tenements are undergoing a routine renewal process with the QLD Government. Coal Reserves for Rolleston are sufficient to support the planned mine life of 22 years.

Togara North: No change in the Coal Resource or Reserve estimation since 31 December 2017.

Tenements for Togara North expire between September 2019 and December 2046.

Wandoan: No change in the Coal Resource or Reserve estimation since 31 December 2017.

Tenements for Wandoan expire between January 2019 and December 2043. Some tenements are undergoing a routine renewal process with the QLD Government. Coal Reserves for Wandoan are sufficient to support a planned mine life greater than 30 years.

Milray: No change in the Coal Resource estimation since 31 December 2017.

Tenement for Milray expires in January 2021.

Pentland: No change in the Coal Resource estimation since 31 December 2017.

Tenements for Pentland expire between October 2019 and September 2021.

Clermont: Clermont Coal Resources estimated for the extraction of thermal coal via open cut methods.

Coal Resource and Reserve depletion due to mining (-12Mt) and sterilisation (-1Mt).

Coal Reserve increase due to resource reclassification from new drilling (+1.5Mt). This additional drilling data has resulted in a Coal Reserve CV decrease (-150kcal/kg).

Tenements for Clermont expire between April 2020 and July 2031. Coal Reserves at Clermont are sufficient to support the planned mine life for 9 years.

Hail Creek:

Hail Creek Operations: Newly acquired asset.

Previous Rio Tinto estimates of resources were exclusive of reserves. This estimate is inclusive of reserves. The Rio Tinto Coal Reserve estimate was based on the mine plan in place at the time of acquisition. This estimate has been taken as a valid base to apply deletion by mining, as the basis for this estimate. It is anticipated that a revised mine plan will be applied to future estimates.

Hail Creek Coal Resources estimated for the extraction of thermal and coking coal via open cut methods. Approximately 60% of reserves are coking coal and the remainder is thermal coal.

Coal Resource and Reserve depletion due to mining (-5Mt).

Tenements for Hail Creek expire December 2019. Some tenements are undergoing a routine renewal process with the QLD Government. Coal Reserves at Hail Creek are sufficient to support the planned mine life for 20 years.

Lake Elphinstone: Newly acquired asset.

Lake Elphinstone Resources estimated for the extraction of thermal coal via open cut methods. Rio Tinto Resource model re-applied for 2018 reporting period due to timing of the acquisition. The previous estimate did not include a quality estimation. There is currently no mine plan at Lake Elphinstone.

Tenements for Lake Elphinstone expire December 2019.

Mt Robert: Newly acquired asset.

Mt Robert Coal Resources estimated for the extraction of thermal coal via open cut methods.

Rio Tinto Resource model re-applied for 2018 reporting period due to timing of the acquisition. The previous estimate did not include a quality estimation.

Tenements for Mt Robert expire between November 2019 and August 2020. Some tenements are undergoing a routine renewal process with the QLD Government. There is currently no mine plan at Mt Robert.

Valeria: Newly acquired asset.

Valeria Coal Resources estimated for the extraction of thermal and semi soft coking coal via open cut methods.

Rio Tinto Resource model re-applied for 2018 reporting period due to timing of the acquisition.

Tenements for Valeria expire between June 2019 and September 2021. There is currently no mine plan at Valeria.

Energy Products Coal

Competent Persons

AC = Andrew Connell, Principal Mining Engineer, Glencore Coal Assets Australia (AusIMM);

HB = Hans Binnekamp, Senior Mine Planner, Clermont Open Cut (AusIMM);

JB = Jarrod Bennedick, Senior Geologist, Rolleston Coal (AusIMM);

JT = John Terrill, Principal Resource Geologist, Glencore Coal Assets Australia (AIG);

LP = Lyndon Pass, Director/Principal Resource Geologist, Encompass Mining (AusIMM);

MS = Michael Stadler, Senior Geologist, Glencore Coal Assets Australia (AusIMM);

RH = Richard Hingst, Resource Geologist, Oaky Creek Coal (AusIMM);

RJ = Rowan Johnson, Senior Geologist, McElroy Bryan Geological Services Pty Ltd (AusIMM);

RM = Rob Molan, Senior Planning Engineer, Rolleston Coal (AusIMM);

SW = Steve Winter, Technical Services Manager, Oaky Creek Surface Operations (AusIMM).

Energy Products Coal

South Africa Coal Resources

Name of operation	Attributable interest	Mining Method	Commodity	Measured Coal Resources 31.12.18	Measured Coal Resources 31.12.17	Indicated Coal Resources 31.12.18	Indicated Coal Resources 31.12.17	Inferred Coal Resources 31.12.18	Inferred Coal Resources 31.12.17	Competent Person
Tweefontein	79.8%		Thermal Coal (Mt)	**870**	**875**	**60**	**60**	**38**	**38**	
Tweefontein North		OC/UG	Thermal Coal (Mt)	670	675	–	–	8	8	MS
			CV (kcal/kg)	5,250	5,250	–	–	5,500	5,500	
Tweefontein South		OC/UG	Thermal Coal (Mt)	200	200	60	60	30	30	MS
			CV (kcal/kg)	5,350	5,350	4,350	4,350	4,600	4,600	
Goedgevonden	74%	OC/UG	Thermal Coal (Mt)	**510**	**515**	**7**	**7**	**1**	**1**	MS
Complex			CV (kcal/kg)	4,800	4,800	5,000	5,000	3,450	3,450	
iMpunzi	79.8%		Thermal Coal (Mt)	**370**	**380**	**13**	**13**	**2**	**2**	
iMpunzi North		OC	Thermal Coal (Mt)	240	250	4	4	2	2	MS
			CV (kcal/kg)	5,250	5,250	5,500	5,500	5,600	5,600	
iMpunzi East		OC	Thermal Coal (Mt)	130	130	9	9	–	–	MS
			CV (kcal/kg)	5,400	5,400	5,250	5,250	–	–	
Zonnebloem	100%	OC	Thermal Coal (Mt)	**190**	**190**	**35**	**35**	–	–	MS
			CV (kcal/kg)	5,150	5,150	4,850	4,850	–	–	
Oogiesfontein	100%	UG	Thermal Coal (Mt)	**44**	**55**	**18**	**18**	–	–	MS
			CV (kcal/kg)	4,950	4,950	4,950	4,950	–	–	
Paardekop	100%	UG	Thermal Coal (Mt)	**120**	**120**	**575**	**575**	**80**	**80**	MS
			CV (kcal/kg)	5,350	5,350	5,400	5,400	5,350	5,350	
Nooitgedacht	100%	UG	Thermal Coal (Mt)	**21**	**21**	**40**	**40**	**5**	**5**	MS
			CV (kcal/kg)	4,850	4,850	4,850	4,850	4,850	4,850	
Undeveloped	100%	OC/UG	Thermal Coal (Mt)	–	–	**12**	**12**	**100**	**100**	MS
Resources			CV (kcal/kg)	–	–	4,750	4,750	5,400	5,400	
Izimbiwa	49.99%		Thermal Coal (Mt)	**126**	**141**	**40**	**40**	**38**	**38**	
MBO		OC	Thermal coal (Mt)	30	35	–	–	2	2	MS
			CV (kcal/kg)	5,600	5,600	–	–	5,600	5,600	
Lakeside		OC/UG	Thermal coal (Mt)	–	5	–	–	–	–	MS
			CV (kcal/kg)	–	4,500	–	–	–	–	
Leeuwfontein		OC	Thermal coal (Mt)	–	5	–	–	–	–	MS
			CV (kcal/kg)	–	4,600	–	–	–	–	
Springlake		UG/OC	Thermal coal (Mt)	16	16	5	5	6	6	MS
			CV (kcal/kg)	5,800	5,800	5,750	5,750	5,700	5,700	
Argent		OC	Thermal coal (Mt)	28	28	–	–	–	–	MS
			CV (kcal/kg)	5,100	5,100	–	–	–	–	
Springboklaagte*		UG/OC	Thermal coal (Mt)	52	52	35	35	30	30	MS
			CV (kcal/kg)	5,100	5,100	5,050	5,050	4,950	4,950	

* Springboklaagte is held as a Joint Venture between Izimbiwa and Umcebo, 100% of the Springboklaagte resources are included in the table above under Izimbiwa and excluded from Umcebo.

Energy Products Coal

South Africa Coal Resources (continued)

Name of operation	Attributable interest	Mining Method	Commodity	Measured Coal Resources 31.12.18	Measured Coal Resources 31.12.17	Indicated Coal Resources 31.12.18	Indicated Coal Resources 31.12.17	Inferred Coal Resources 31.12.18	Inferred Coal Resources 31.12.17	Competent Person
Umcebo	48.67%		Thermal Coal (Mt)	**158**	**178**	**44**	**44**	**86**	**91**	
Klippan		OC	Thermal Coal (Mt)	3	3	1	1	–	–	KD
			CV (kcal/kg)	5,800	5,800	5,800	5,800	–	–	
Kleinfontein Jicama			Thermal Coal (Mt)	–	11	–	–	–	5	KD
			CV (kcal/kg)	–	5,200	–	–	–	5,200	
Wonderfontein		OC/UG	Thermal Coal (Mt)	70	75	5	5	1	1	MS
			CV (kcal/kg)	5,350	5,350	5,200	5,200	4,900	4,900	
Norwesco		OC	Thermal Coal (Mt)	1	1	–	–	–	–	GC
			CV (kcal/kg)	5,000	5,000	–	–	–	–	
Doornrug		OC	Thermal Coal (Mt)	–	4	–	–	–	–	GC
			CV (kcal/kg)	–	5,000	–	–	–	–	
Hendrina		UG	Thermal Coal (Mt)	24	24	20	20	80	80	MS
			CV (kcal/kg)	4,400	4,400	4,400	4,400	4,700	4,700	
Belfast	24.34%	UG	Thermal Coal (Mt)	60	60	18	18	5	5	MS
			CV (kcal/kg)	5,200	5,200	5,050	5,050	5,150	5,150	
Coal Resources South Africa			**Thermal Coal (Mt)**	**2,409**	**2,475**	**844**	**844**	**350**	**355**	

Energy Products Coal

South Africa Coal Reserves

Name of operation	Attributable interest	Mining method	Coal type	Extractable Coal Reserves Proved 31.12.18	Extractable Coal Reserves Probable 31.12.18	Saleable Coal Reserves Proved 31.12.18	Saleable Coal Reserves Probable 31.12.18	Total Saleable Coal Reserves 31.12.18	Total Saleable Coal Reserves 31.12.17	Competent Person
Tweefontein	79.8%		Thermal Coal (Mt)	**194**	**11**	**127**	**8**	**135**	**141**	
Tweefontein		UG/OC	Thermal Coal (Mt)	185	11	120	8	128	134	TH
North			*Export (Mt)*			*80*	*5*	*85*	*84*	
			CV (kcal/kg)			*5,900*	*5,900*	*5,900*	*5,900*	
			Domestic (Mt)			*40*	*3*	*43*	*50*	
			CV (kcal/kg)			*5,100*	*5,100*	*5,100*	*5,100*	
Tweefontein		UG/OC	Thermal Coal (Mt)	9	–	7	–	7	7	TH
South			*Export (Mt)*			*7*	*–*	*7*	*7*	
			CV (kcal/kg)			*5,900*	*–*	*5,900*	*5,900*	
Goedgevonden	74%	OC	Thermal Coal (Mt)	**280**	**10**	**173**	**5**	**178**	**180**	CT
			Export (Mt)			*77*	*2*	*79*	*79*	
			CV (kcal/kg)			*6,000*	*6,000*	*6,000*	*6,000*	
			Export (Mt)			*74*	*2*	*76*	*68*	
			CV (kcal/kg)			*5,100*	*5,100*	*5,100*	*5,100*	
			Domestic (Mt)			*22*	*1*	*23*	*33*	
			CV (kcal/kg)			*5,100*	*5,100*	*5,100*	*5,100*	
iMpunzi	79.8%		Thermal Coal (Mt)	**135**	**6**	**79**	**2**	**85**	**86**	
iMpunzi North		OC	Thermal Coal (Mt)	35	3	19	1	24	24	TH
			Export (Mt)			*17*	*1*	*18*	*22*	
			CV (kcal/kg)			*5,700*	*5,700*	*5,700*	*5,700*	
			Domestic (Mt)			*2*	*–*	*2*	*2*	
			CV (kcal/kg)			*5,100*	*–*	*5,100*	*5,100*	
iMpunzi East		OC	Thermal Coal (Mt)	100	3	60	1	61	62	TH
			Export (Mt)			*51*	*1*	*52*	*53*	
			CV (kcal/kg)			*5,700*	*5,700*	*5,700*	*5,700*	
			Domestic (Mt)			*9*	*–*	*9*	*9*	
			CV (kcal/kg)			*5,100*	*–*	*5,100*	*5,100*	
Zonnebloem	100%	OC	Thermal Coal (Mt)	**–**	**157**	**–**	**78**	**78**	**80**	TH
			Export (Mt)				*39*	*39*	*40*	
			CV (kcal/kg)				*6,000*	*6,000*	*6,000*	
			Domestic (Mt)				*39*	*39*	*40*	
			CV (kcal/kg)				*5,100*	*5,100*	*5,100*	
Nooitgedacht	100%	UG	Thermal Coal (Mt)	**–**	**33**	**–**	**22**	**22**	**22**	MS
			Export (Mt)				*11*	*11*	*11*	
			CV (kcal/kg)				*5,900*	*5,900*	*5,900*	
			Domestic (Mt)				*11*	*11*	*11*	
			CV (kcal/kg)				*5,100*	*5,100*	*5,100*	
Oogiesfontein	100%	OC	Thermal Coal (Mt)	**–**	**7**	**–**	**4**	**4**	**5**	TH
			Export (Mt)				*3*	*3*	*4*	
			CV (kcal/kg)				*5,900*	*5,900*	*5,900*	
			Domestic (Mt)				*1*	*1*	*2*	
			CV (kcal/kg)				*5,100*	*5,100*	*5,100*	

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South Africa Coal Reserves (continued)

Name of operation	Attributable interest	Mining method	Coal type	Extractable Coal Reserves Proved 31.12.18	Extractable Coal Reserves Probable 31.12.18	Saleable Coal Reserves Proved 31.12.18	Saleable Coal Reserves Probable 31.12.18	Total Saleable Coal Reserves 31.12.18	Total Saleable Coal Reserves 31.12.17	Competent Person
Izimbiwa	49.99%		Thermal Coal (Mt)	**25**	**26**	**20**	**24**	**44**	**44**	
MBO		OC	Thermal Coal (Mt)	25	–	20	–	20	21	MC
			Export (Mt)			*7*	–	*7*	*4*	
			CV (kcal/kg)			*5,900*	–	*5,900*	*5,800*	
			Domestic (Mt)			*3*	–	*3*	*5*	
			CV (kcal/kg)			*4,800*	–	*4,800*	*5,800*	
			Domestic (Mt)			*10*	–	*10*	*12*	
			CV (kcal/kg)			*4,200*	–	*4,200*	*4,500*	
Argent		OC	Thermal Coal (Mt)	–	26	–	24	24	24	MC
			Export (Mt)				*19*	*19*	*19*	
			CV (kcal/kg)				*4,500*	*4,500*	*4,500*	
			Domestic (Mt)				*5*	*5*	*5*	
			CV (kcal/kg)				*4,500*	*4,500*	*4,500*	
Umcebo	48.67%		Thermal Coal (Mt)	**49**	**–**	**35**	**–**	**35**	**37**	
Wonderfontein		OC/UG	Thermal Coal (Mt)	49	–	35	–	35	37	MC
			Export (Mt)			–	–	–	–	
			CV (kcal/kg)			–	–	–	–	
			Domestic (Mt)			*35*	–	*35*	*37*	
			CV (kcal/kg)			*4,500*	–	*4,500*	*4,500*	
Norwesco		OC	Thermal Coal (Mt)	0.3	–	0.2	–	0.2	0.2	HG
			Export (Mt)			0.2	–	*0.2*	*0.2*	
			CV (kcal/kg)			5,600	–	*5,600*	*5,600*	
			Domestic (Mt)			0.05	–	*0.05*	*0.05*	
			CV (kcal/kg)			4,500	–	*4,500*	*4,500*	
Coal Reserves South Africa	**Thermal Coal (Mt)**			**683**	**250**	**434**	**143**	**581**	**595**	

Energy Products Coal

Notes

South African Coal Resources and Reserves have been prepared in accordance with 2016 edition of the South African Code for the Reporting of Exploration Results, Coal Resources and Coal Reserves (the SAMREC Code) and the South African guide to the systematic evaluation of coal resources and coal reserves (SANS 10320:2004)

In accordance with the 2016 SAMREC Code, Coal Resources are reported on a Mineable Tonnes In Situ (MTIS) basis. Gross tonnes in situ represents the coal resource at specified moisture content and quality parameters above the minimum coal seam thickness cut-off. In addition, MTIS applies estimates related to the specific mining method and level of dilutive/contaminated material that may be expected, and adjusted for the geological loss factors and derating for previous mining activities. The eventual coal production may be lower or higher than the MTIS due to a wide range of uncertainties.

Coal Resources have been re-estimated in 2018 for inclusion in this summary table except where otherwise stated. Revision of the totals includes changes to classifications of Coal Resource status due to exploration, geological reinterpretation and remodelling, and changes to lease holdings.

Coal Resources and Reserve qualities are reported at an air dried moisture basis and Export Saleable Coal Reserves are reported at a net as received moisture basis. Coal Resources are reported inclusive of Coal Reserves.

Product yields used to estimate Saleable Coal Reserves were derived from the “Limn Model” software. Inputs to this model are coal ply and in-seam dilution data, processed in the model. The model takes into account plant efficiencies to calculate practical yields. The model is calibrated to historical plant performance and where applicable, large diameter borehole data is used.

Changes and notes relevant to the estimation of Coal Resources and Reserves are listed below for specific projects. Unless otherwise specified, changes reported are exclusive of production from 31 December 2017 to 31 December 2018. Depletion due to mining is based on the actual depletion from January to September, and a forecast for October to December. This forecast number is reconciled each year to the actual and an adjustment is made accordingly.

Coal Resource and Reserve totals are rounded to appropriate levels of accuracy in accordance with the 2016 SAMREC Code and the Glencore Coal rounding process. In summary, Measured and Indicated Coal Resources are rounded to 1 significant figure if less than 10Mt and 2 significant figures if greater than 10Mt; calorific values are rounded to the nearest 50kcal/kg.

Tweefontein Complex

Tweefontein North: Resource depletion due to mining (-12.6Mt). 4.4Mt increase in resources with the drilling of an additional 56 boreholes in the Makoupan area, resulting in a larger S2U footprint and an increase in thickness on the 4 Seam.

The Tweefontein North development includes all five seams present in the Vryheid Formation, however, only the No.1, No. 2, No. 4 and No. 5 seams form part of the mineable and economic Coal Resources. The resources have the potential to be extracted via both opencast truck and shovel or dragline, and underground bord and pillar mining methods.

Coal Reserve depletion due to mining (-13.4Mt). 2 Seam Upper coal mined by Tweefontein North Underground Operation was not included as reserves previously; this low quality coal was mined to take advantage of the local Sasol low grade coal market. In addition more coal was gained as a result of changes in 4 Seam Pillar mining logic in the Makoupan and Klipplaat pits which resulted in “below 25% yield cut-off material” being moved into reserves with an overall net gain of 0.7Mt of extractable reserves and 1.7Mt of saleable coal reserves.

Mining Tenement for Tweefontein North expires in August 2020, and an application for an extension will be lodged in 2019. Coal Reserves for Tweefontein North are sufficient to support a mine life of 14 years.

Tweefontein South: Tweefontein South Complex is contained in the iMpunzi new order mining right and in the Klippoortje old order mining authorisation, for which a section 102 application was submitted to incorporate it into the iMpunzi mining right. The mining area development includes all five seams, however only the No.1, No. 2, No. 4 and No. 5 seams form part of the potentially mineable and economic Coal Resources.

No mining was conducted in 2018 and the 5 Seam Addcar Coal Reserves remain available for future extraction.

Tenements for Tweefontein South expire between August 2024 and August 2040. Coal Reserves for Tweefontein South are sufficient to support a mine life of 10 years.

Goedgevonden: Resource depletion due to mining (-9.7Mt)

The Goedgevonden Complex is situated within the Witbank coal field. Opencast dragline mining operations in the area are extracting the No. 2, No. 4 and No. 5 seams. The No. 3 seam is too thin for practical extraction and the No.1 seam is not considered an economic Coal Resource in the area.

Coal Reserve depletion due to mining (-9.3Mt). The pan in the south pit is now included to be mined, resulting in an increase of 4.7Mt of reserves. An additional 0.7Mt was also gained due to the mining methodology changing from split seam mining to composite seam mining.

Tenements for Goedgevonden expire between February 2038 and May 2038. Coal Reserves for Goedgevonden are sufficient to support a mine life of 25 years.

iMpunzi

iMpunzi North Coal Resource depletion due to mining (-8.8Mt).

iMpunzi consists of iMpunzi Opencast (opencast dragline and truck and shovel operations) and iMpunzi Mini-pits (truck and shovel operations). The Opencast resources include the No.1, No. 2 and No. 4 seams, whilst the Mini-pit includes only the No. 4 seam.

Coal Reserve depletion due to mining (-8.5Mt). 2.5Mt of coal was added to reserves due to layout changes in the eastern extent of the North Pit. The low quality 2 Top Seam was added to the mining horizon in the North Pit resulting in a reserve gain of 1.34Mt.

Mining tenement for iMpunzi North expires in August 2040. Coal Reserves for iMpunzi North and East are sufficient to support a mine life of 14 years.

iMpunzi East: Resource depletion due to mining (-2.4Mt). A block of 3.3Mt of inventory coal was added to Measured Resources and a portion (0.2Mt) was mined in 2018.

A large portion of No. 2 seam and a small area of No. 4 seam have been previously mined via underground bord and pillar method. The full seam is extracted through opencast mining methods – the lower zone of each seam was previously partially extracted by underground mining and the upper zone remains intact.

Reserve depletion due to mining (-2.6Mt). 0.2Mt of reserves were mined outside the mining layout (inventory resources as discussed above).

Zonnebloem: Resource depletion due to mining (-0.5Mt). Phase 1 of Zonnebloem was started using a contractor utilising truck and shovel mining. Infill drilling, re-modelling and delineation of a no-coal area in Central Pit resulted in a Resource reduction (-1.4Mt)

The No. 1 and No. 2 seams are developed at Zonnebloem with planned extraction by opencast truck and shovel operations.

Reserve depletion due to mining (-0.5Mt). Changes to the mining layout to avoid the no coal area in the Central Pit resulted in a reserve loss of 1.5Mt.

Mining and environmental licensing and permitting has been finalised. Mining tenement for Zonnebloem expires in September 2039. Coal Reserves for Zonnebloem are sufficient to support a mine life of 24 years.

Oogiesfontein: The Northern resource block on Oogiesfontein, (located north of the town of Oogies – Block 1) was acquired by South 32, reducing the Resources (-13.82Mt).

A Section 102 application was approved to incorporate the remaining resources of Oogiesfontein into the Goedgevonden Complex. Awaiting environmental licensing and permitting to be finalised.

The reserve was reduced by 1.6Mt due to the sale of Block 1 to South 32.

Paardekop: A new order mining right was granted in 2017. Awaiting approval of environmental licensing and permitting. The project area comprises of underground resources in a single-seam.

The seam of economic importance in Paardekop project area is the Main seam which contains nearly 95% of the extractable coal. The seam has a mean thickness of 2.5m and is structurally almost flat. The upper zone is of poor CV whilst the lower zone has an average raw CV over 5,300kcal/kg.

Undeveloped Coal Resources: Applications for mining rights have been submitted for all the undeveloped Coal Resources. The mining right for Amersfoort was granted, while the Boschmanspoort mining right is still outstanding. The Coal Resource estimation includes:

Amersfoort (contained in the southern portion of the Ermelo Coalfield, Mpumalanga province southwest of Breyten). Estimation for Amersfoort is based on the C seam which is at a depth of 200m and a thickness of 2.5m. Quality of the Amersfoort resource was re-evaluated and adjusted accordingly; and

Boschmanspoort (located in the Witbank Coalfield of Mpumalanga southeast of Middelburg). Estimation for Boschmanspoort is based on the No. 2 seam which dips towards the east, therefore allowing some potential opencast resources in the west.

Izimbiwa Coal: The remaining mine life for individual mining operations range from 2 to 7 years, based on the coal reserves except for the Springboklaagte deposit that extends Izimbiwa's expected life by approximately 20 to 25 years.

Expiry date of relevant mining/concession licenses are different for each mine, ranging from January 2017 to March 2027 in respect of Graspan, Townlands, Steelcoal, and Springlake. An application for extension of the Graspan mining right that lapsed in January 2017 was submitted in October 2016. The renewal application is still under review by the regulator.

The mining right for Argent and Springboklaagte was granted in May 2016 and is awaiting finalisation of the environmental licensing and permitting.

Springboklaagte is held as a Joint Venture between Izimbiwa Coal and Umcebo, 100% of the Springboklaagte Coal Reserves and Resources is included in the table above.

Middelburg Complex (MBO): Graspan, Townlands, Steelcoal and Corobrik, have been grouped into Middelburg Complex (MBO) and will be reported jointly from 2018.

Resource depletion due to mining (-3.5Mt). Resource losses due to environmental and geotechnical restrictions in the Townlands, Steelcoal and Corobrik areas (-0.6Mt).

Reserve depletion due to mining (-3.8Mt). Coal losses in the Townlands area was offset by coal mined outside the mining layout, extraction of the Portion 31 barrier pillar, and blocks in the Townlands area added back to the LOM, resulting in a net gain in reserves (1.5Mt).

Lakeside and Leeuwfontein: Lakeside and Leeuwfontein were sold to Zomhlaba Resources (Pty) Ltd in 2018.

Springlake: Mine continues to be on care and maintenance.

Argent: The Argent resource will be exploited through opencast truck and shovel and is awaiting finalisation of the environmental licensing and permitting before mining can commence.

Springboklaagte: The mining right for Springboklaagte was granted, awaiting environmental licensing and permitting.

Umcebo: The remaining mine life of the individual mining operations range up to 12 years. Expiry date of relevant mining/concession licenses are different for each mine, ranging from October 2017 to December 2037. Renewals have been lodged for Doornrug, Klippan and Norwesco. The Wonderfontein mining right expires in August 2037.

Klippan: The mine is currently closed but is a potential future underground extention to Wonderfontein.

Kleinfontein Jicama: Sold to Kleinfontein Mining Holdings (Pty) Ltd in 2018.

Wonderfontein: Resource depletion due to mining (-3.9Mt).

Wonderfontein consists of an opencast truck and shovel operation. The Opencast resources include the No.1, No. 2, No. 3 and No. 4 seams. The Coal Reserves for Wonderfontein are sufficient to support a mine life of 25 years.

Reserve depletion due to mining (-3.96Mt).

Doornrug: Sold to Madini Mining (Pty) Ltd in 2018.

Hendrina: The Project area is located south of the town of Hendrina in the province of Mpumalanga. The mining right application covers three discrete blocks of ground named Mooivley East, Mooivley West and Bosmanskrans. The area is traversed by the national road N11 which connects Hendrina and Ermelo. The asset is an advanced stage exploration project. It is planned to be developed as an underground mine to supply an Eskom type product. A mining rights application was accepted by the DMR in June 2016.

Energy Products Coal

Belfast: The prospecting right encompasses a number of blocks extending approximately 45km from east of Belfast to west of Wonderfontein. The N4 highway, the Gauteng-Maputo railway and Eskom power lines traverse the area. A prospecting right renewal application has been submitted and executed.

Norwesco: Future project with no changes in Coal Resources or Reserves for the current reporting period.

Competent Persons:

CT = Chris Theart; ND, NHD Metal Mining; SAIMM (706513); Group Mining Engineer, Glencore Coal South Africa;

GC = Gerrit Cronjé, BSc Hons Geology; Pr Sc Nat 400128/86, employed by Izimbiwa Coal (Pty) Ltd.

HG = Hugo Grobler B Engineering Mining; MSc Engineering Mining; MCC, SAIMM; employed by Izimbiwa Coal (Pty) Ltd;

KD = Karin van Deventer; (MSc Geochemistry; Pr Sc Nat 400705/15, employed by Glencore Coal South Africa;

MC = Mark Cunney, BEng Hons Mining Engineering, MCC; Pr Cert Eng 2007 0114, employed by Izimbiwa Coal (Pty) Ltd;

MS = Marius Smith; B Sc. Honours Geology; MBA; Pr Sc Nat 400075/03; Group Coal Geologist, Glencore Coal South Africa;

TH = Trevor Howard; B Eng. Mining; Coal Mine Managers Certificate of Competency; SAIMM (701062); Group Mining Engineer, Glencore Coal South Africa;

Energy Products Coal

Colombia Coal Resources and Reserves

Prodeco Coal Resources

Name of operation	Attributable interest	Mining Method	Commodity	Measured Coal Resources 31.12.18	Measured Coal Resources 31.12.17	Indicated Coal Resources 31.12.18	Indicated Coal Resources 31.12.17	Inferred Coal Resources 31.12.18	Inferred Coal Resources 31.12.17	Competent Person
Calenturitas	100%	OC	Thermal Coal (Mt)	150	160	120	130	70	70	KJW
			CV (kcal/kg)	6,300	6,350	6,200	6,250	6,250	6,300	
La Jagua	100%	OC	Thermal Coal (Mt)	55	60	28	30	–	–	KJW
			CV (kcal/kg)	7,100	7,100	7,050	7,100	–	–	
Coal Resources Prodeco			**Thermal Coal (Mt)**	**205**	**220**	**148**	**160**	**70**	**70**	

Prodeco Coal Reserves

Name of operation	Attributable interest	Mining method	Coal type	Coal Reserves Proved 31.12.18	Coal Reserves Probable 31.12.18	Marketable Coal Reserves Proved 31.12.18	Marketable Coal Reserves Probable 31.12.18	Total Marketable Coal Reserves 31.12.18	Total Marketable Coal Reserves 31.12.17	Competent Person
Calenturitas	100%	OC	Thermal Coal (Mt)	65	15	65	15	80	100	GL
			CV (kcal/kg)	6,200	6,100	6,200	6,100	6,150	6,150	
La Jagua	100%	OC	Thermal Coal (Mt)	45	25	45	25	70	75	GL
			CV (kcal/kg)	6,750	6,750	6,750	6,750	6,750	6,700	
Coal Reserves Prodeco			**Thermal Coal (Mt)**	**110**	**40**	**110**	**40**	**150**	**175**	

Cerrejón Coal Resources

Name of operation	Attributable interest	Mining Method	Commodity	Measured Coal Resources 31.12.18	Measured Coal Resources 31.12.17	Indicated Coal Resources 31.12.18	Indicated Coal Resources 31.12.17	Inferred Coal Resources 31.12.18	Inferred Coal Resources 31.12.17	Competent Person
Carbones del	33.3%	OC	Thermal Coal (Mt)	3,100	3,150	1,200	1,050	700	700	GH
Cerrejón			CV (kcal/kg)	6,550	6,550	6,600	6,600	6,400	6,400	

Cerrejón Coal Reserves

Name of operation	Attributable interest	Mining method	Coal type	Extractable Coal Reserves Proved 31.12.18	Extractable Coal Reserves Probable 31.12.18	Saleable Coal Reserves Proved 31.12.18	Saleable Coal Reserves Probable 31.12.18	Total Saleable Coal Reserves 31.12.18	Total Saleable Coal Reserves 31.12.17	Competent Person
Carbones del	33.3%	OC	Thermal Coal (Mt)	330	60	315	60	375	460	SC
Cerrejón			CV (kcal/kg)	6,100	6,150	6,050	6,100	6,100	6,150	

Notes

Glencore's Colombian coal interests are located in two different coal provinces; in the La Guajira Department (Cerrejón) and the Cesar Department (Prodeco).

Extractable Reserves are as mined Coal Reserves taking into account geological losses, mining losses, contamination and as mined moisture adjustments. Reserves are reported on a ROM moisture basis. Coal Resources are reported on an *in situ* moisture basis.

Saleable Reserves: As sold basis are Coal Reserves adjusted for yield losses in the preparation plant (if applicable) and converted to a saleable moisture basis. The Coal Resource and Coal Reserve estimates tabulated above are stated on a total mine basis as at 31 December 2018.

Coal Resource qualities are reported on an *in situ* moisture basis and Coal Reserve qualities are reported on a gross as received basis. Coal Resources are reported inclusive of those Coal Resources modified to produce Coal Reserves. Coal tonnages are quoted as million metric tonnes

Changes and issues material to the estimation of Coal Resources and Reserves are noted below for specific projects. Reference to production changes between 31 December 2017 and 31 December 2018 are detailed for each producing mine site.

Coal Resource and Coal Reserve totals are rounded to appropriate levels of accuracy in accordance with the 2012 JORC Code and the Glencore Coal Assets rounding procedures.

Prodeco:

Calenturitas: The geological model was updated with new exploration and mining data that resulted in a decrease of coal seam thickness near the identified fault in Sector A and within the steep dip areas of Sector A and the northern area of Sector B (-9.0Mt Indicated and -7.0Mt Inferred Resources). A small decrease of 0.3Mt due to update of base of weathering using new exploration and in-pit data. Indicated Resources for seams C195 – C120 in Sector CD were removed (-8.7Mt) due to low potential for mining these thin seams under waste west of the current mined out area of Sector C. Additional Inferred Resources (+6Mt) reported for seams C155 – C130 in the south in the deeper part of Sector A near the syncline axis.

Marketable Coal Reserves depletion due to mining (-7Mt). Coal Reserves increases due to pit shell updates to reflect cutback designs and pit limit to Alamosa Channel (-16Mt).

Remaining mine life expected to be 8 years. Expiry date of relevant mining/concession licenses: 2035.

La Jagua: Historical records and a recent drill hole provided additional data to rebuild the surface under a spoil pile in the eastern flank of the syncline within the Carbones de La

Jagua (CDJ) area. Updated topography limiting coal seams was found to be higher than previously modelled (+0.8Mt). Base of weathering updated using recent drill hole data and review of weathering horizon (+0.3Mt). Area in the west flank and CDJ leases 0.4Mt of coal mainly in seam M45 was sterilised for pit stability. Geological model update, including latest drill hole data and pit mapping, led to a reclassification of Measured (-15Mt) and Indicated (+10Mt) Resources, mostly in the deepest part of the basin below Cerro de Piedra.

Marketable Coal Reserves depletion due to mining (-5.0Mt). Coal Reserves decreases due to Pit shell updated to include a buttress to guarantee a sump for water management and create room for backfill; and a new cutback design on western flank which left some M45 in-situ (-3.0Mt). Coal Reserves decreases due to new geological model (-1.0Mt).

Remaining mine life expected to be 10 years. Expiry date of relevant mining/concession licenses: Carbones El Tesoro (CET), Consorcio Minero Unido (CMU) and Carbones de La Jagua (CDJ) expire between 2027 and 2038.

Cerrejón: Coal Resources are reported as gross tonnes in situ, i.e. thin seams (<0.65m) excluded with no geological losses applied, approximately 150Mt of coal excluded. The Coal Resources occur within a 'geoshell' constrained by the horizontal and vertical distribution of data within the drill hole (data limits) envelope. Resources include coal for which the continuity, quality and mineability are established but are outside the current LOM plan. Total resources include approximately 780Mt of coal associated to rivers requiring additional permit approvals.

There are approximately 230Mt of coal within the geoshell and within 1 km of major towns that has not been included in the Coal Resources in 2018. Coal Resources comply with current and foreseen mining and marketing criteria and have economic potential.

Coal Reserves have reduced by 85Mt due principally to depletion by mining (-31Mt) and changes to the LOM plan reflecting uncertainties across various mining areas.

The current mining rights expire in 2033.

Competent Persons

GL = Guillermo Leon, Superintendent Mine Planning, Prodeco, (AusIMM).

KJW = Kerry Whitby, Managing Director, McElroy Bryan Geological Services Pty Ltd (AusIMM).

GH = German Hernandez; BSc, BHPBilliton Certificate of Competent Person; GSSA; APS Geology Superintendent, Carbones del Cerrejón.

SC = Shah Chaudari, Strategic Planning Manager, Cerrejon (AusIMM)

Energy Products Coal

Canada Coal Resources

Name of operation	Attributable interest	Mining Method	Commodity	Measured Coal Resources 31.12.18	Measured Coal Resources 31.12.17	Indicated Coal Resources 31.12.18	Indicated Coal Resources 31.12.17	Inferred Coal Resources 31.12.18	Inferred Coal Resources 31.12.17	Qualified Person
Suska	75%	OC	Coking/Thermal Coal (Mt)	–	–	13	13	90	90	KJW
			CV (kcal/kg)	–	–	6,100	6,100	6,100	6,100	
Sukunka	75%	UG/OC	Coking Coal (Mt)	45	45	100	100	40	40	KJW
Coal Resources Canada			**Coking/Thermal Coal (Mt)**	**45**	**45**	**113**	**113**	**130**	**130**	

Notes

Glencore's Canadian coal resources and reserves (Sukunka, Suska) occur in the Peace River area of the Province of British Columbia. Additional tenements adjacent to these Peace River projects are targeted for exploration. These include tenement areas identified as Central South, South Cirque and other tenements that extend north and south of the Pine River.

Coal Resource tonnage and quality are reported at an *in situ* moisture basis. Coal Resources are reported in accordance with the JORC Code 2012 edition.

No coal was mined from the Glencore Canadian coal assets in 2018.

Suska: Coal Resources have not been re-estimated since 2013.

Sukunka: Coal Resources have not been re-estimated since 2015.

Competent Person

KJW = Kerry Whitby, Managing Director, McElroy Bryan Geological Services Pty Ltd (AusIMM).

Energy Products
Oil

Net Reserves (Proven and Probable)[1]

	Working Interest Basis								
	Equatorial Guinea		Chad		Cameroon		**Total**		
	Oil mmbbl	Gas bcf	Oil mmbbl	Gas bcf	Oil mmbbl	Gas bcf	Oil mmbbl	Gas bcf	Combined mmboe
31 December 2017	17	146	96	–	3	–	**116**	**146**	**141**
Revisions	–	8	9	–	–	–	**9**	**8**	**10**
Production	(2)	–	(3)	–	–	–	**(5)**	**–**	**(5)**
31 December 2018	**15**	**154**	**102**	**–**	**3**	**–**	120	154	147

Net Contingent Resources (2C)[1]

	Working Interest Basis								
	Equatorial Guinea		Chad		Cameroon		**Total**		
	Oil mmbbl	Gas bcf	Oil mmbbl	Gas bcf	Oil mmbbl	Gas bcf	Oil mmbbl	Gas bcf	Combined mmboe
31 December 2017	23	454	61	–	4	–	**88**	**454**	**166**
31 December 2018	**23**	**454**	**61**	**–**	**4**	**–**	88	454	166

[1] "Net" Reserves or Resources are equivalent to Glencore's working interest in the asset/property.

Notes

Equatorial Guinea: Equatorial Guinea reserves and contingent resources consist of Block O (Glencore 25% working interest ("WI")) and Block I (Glencore 23.75% WI) reserves and resources.

The Aseng field (Block I, 23.75% WI) came on stream in November 2011. The field is produced from subsea wells tied back to an FPSO. Average 2018 gross production was ~18,100 barrels per day.

The Alen field (95% Block O, 25% WI and 5% Block I, 23.75% WI) came on stream in May 2013. Gross production in 2018 was ~6,050 barrels per day. The field is produced from subsea wells tied back to a production platform where condensate is stripped and transported to the Aseng FPSO (Floating Production, Storage and Offloading) via a subsea pipeline. The produced gas is currently re-injected into the field but will be commercialised from 2021 onwards.

The Aseng and Alen fields have a 25 year exploitation term from approval of a plan of development.

Reserves for Equatorial Guinea were independently assessed by McDaniel & Associates (McDaniel), have been prepared in accordance with the Petroleum Resources Management System (PRMS) and have been extracted without material adjustment from the McDaniel report dated 31 December 2018. Contingent resources are based on Glencore estimates and have been prepared in accordance with PRMS.

Chad: Glencore holds a majority WI in the DOB/DOI, Doseo/Borogop and DOH production sharing contracts. Glencore holds an 85% WI in the Badila and Mangara oil field Exclusive Exploitation Authorisations (EXAs) and a 75% WI in the Krim EXA. The Krim onshore field is due to come on stream in the next few years.

The Badila field is an onshore development which came on stream in September 2013. Oil is transported through an export pipeline to the Chad/Cameroon export pipeline (Totco/Cotco pipeline) with off-take at the Marine Terminal in Cameroon. Average gross 2018 production was ~5,800 barrels per day.

The Mangara field is an onshore development that has been producing since late December 2014. Gross production in 2018 was ~4,700 barrels per day. Oil is transported through an export pipeline to the Totco/Cotco pipeline with off-take at the Marine Terminal in Cameroon.

The EXA's have a 25 year exploitation term after the authorisation of the EXA.

Reserves for Chad were independently assessed by McDaniel, have been prepared in accordance with PRMS and have been extracted without material adjustment from the McDaniel report dated 31 December 2018. Contingent resources are based on Glencore estimates and have been prepared in accordance with PRMS.

Cameroon: Following the state NOC exercising its back-in right and a farm-down agreement signed in 2018 to divest a 37.5% WI in the Bolongo licence, Glencore will hold a 37.5% WI in the licence. This has been reflected in the table above at 31 December 2017 and 31 December 2018. A phased oil development within the license will now follow.

Reserves for Cameroon were independently assessed by McDaniel, have been prepared in accordance with PRMS and have been extracted without material adjustment from the McDaniel report dated 31 December 2018. Contingent resources are based on Glencore estimates and have been prepared in accordance with PRMS.