NORTHPARKES MINING AND TECHNICAL INFORMATION

On behalf of the Northparkes Joint Venture, China Molybdenum Co., Ltd. ("**CMOC**") as operator prepares reserve and resource estimates in accordance with the guidelines and principles of the JORC Code 2012, and under supervision of Competent Persons, and has prepared this summary of mining and technical information.

Project Description, Location and Access

Northparkes is operated by CMOC on behalf of the Northparkes Joint Venture, an unincorporated joint venture between CMOC (80%), SC Mineral Resources Pty Ltd. (6.7%) and Sumitomo Metal Mining Oceania Pty Limited (13.3%) (the latter two collectively, "**Sumitomo**"). Northparkes operates block cave and open cut mines and an ore processing plant located 27 km north of Parkes in central New South Wales, Australia. Northparkes, which is accessible via paved road, is located at an elevation of 280m above sea level on the plains to the west of the Great Dividing Range, in the headwaters of the Bogan River, which is part of the Murray Darling Basin. The land surrounding the operations is mainly used for farming. Annual rainfall is in the range 400 - 1000 mm (average 600 mm).

Northparkes comprises the mining licences ML1247, ML1367, ML1641 and ML1743, which are enclosed by the exploration licences EL5323, EL5800, EL5801 and EL8377. The mining licences are valid and have renewals due between 2029 and 2039 and the exploration licences are valid and have renewals due between 2023 and 2024. Northparkes owns 6,000 ha of land around the mine, of which the mining leases cover 1,630 ha. The remaining land is actively farmed.

A royalty of four percent is payable to the Government of the State of New South Wales and is calculated on an ex-mine basis, less allowable deductions, which include, inter alia, treatment and refining charges, on-site treatment, processing, marketing and penalties.

History

Copper and gold mineralisation was discovered at E22 in 1976 by Geopeko, the exploration arm of Peko-Wallsend Limited, via road-side traverse drilling. Subsequently, the E27 and E26 deposits were discovered by drilling a grid of RAB drillholes in 1978 and 1980, respectively. North Limited ("**North**") acquired the Northparkes project through its merger with Peko-Wallsend Limited in the 1980s. North approved the Northparkes project, comprising underground block cave and open cut mines and concentrator, in 1992, following an extensive and lengthy studies phase. North subsequently formed the Northparkes joint venture with Sumitomo Metal Mining Oceania and Sumitomo Corporation in 1993 in order to obtain a development partner with downstream smelting and refining capability. Rio Tinto acquired North Limited in 2000 and assumed management of the Northparkes joint venture. In 2004 the second block cave mine, E26 Lift 2 was commissioned, with a northern extension added in 2008 (E26L2N) followed by initial production from E48 Lift 1 in 2010. In 2012, the nameplate mill throughput was increased to 6.4 Mtpa. CMOC acquired Rio Tinto's stake in the Northparkes joint venture in 2013. Fully automated mining and haulage was achieved in 2015 from E48 and Northparkes celebrated its 25th year of production in

2019. Northparkes milled 6.5 Mt in 2020 at a grade of 0.63% copper and 0.18 g/t gold to yield 107.5 kt of concentrate at a grade of 32.5% copper and 8.0 g/t gold. Northparkes has recently completed commissioning of the expansion project increasing throughput of the operation to 7.6Mtpa. Table 1 presents a summary of Northparkes historical production statistics for 2018-2020.

Table 1: Northparkes historical production statistics

	Units	2017	2018	2019	2020
Mining					
Tonnage	*(kt)*	6,466	6,525	6,284	6,483
Milling					
Ore Milled	*(kt)*	6,510	6,486	6,423	6,494
Copper Head Grade	*(%)*	0.78	0.73	0.65	0.63
Gold Head Grade	*(g/t)*	0.23	0.21	0.16	0.18
Copper Recovery	*(%)*	87.7	87.5	88.4	853
Gold Recovery	*(%)*	75.4	78.2	76.4	72.6
Copper in Concentrate	*(t)*	45,155	41,297	36,979	34,916
Gold in Concentrate	*(oz)*	37,021	33,322	25878	27,496

Geological Setting, Mineralisation and Deposit Types

The Northparkes deposits occur within the Ordovician Goonumbla Volcanics of the Goonumbla Volcanic Complex and Wombin Volcanics. The Goonumbla Volcanics form part of the Junee-Narromine Volcanic Belt of the Lachlan Orogen and consist of a folded sequence of trachyandesitic to trachytic volcanics and volcaniclastic sediments that are interpreted to have been deposited in a submarine environment.

The Goonumbla Volcanics at Northparkes have undergone little deformation, with gentle to moderate bedding dips as a result of regional folding. The dominant structure observed to date in the Northparkes area is the Altona Fault, an east-dipping thrust fault, which truncates the top of E48 and GRP314 and is known to extend from east of E26 north through E27.

The porphyries form narrow, typically less than 50 m in diameter, but vertically extensive (greater than 1,000 m) pipes. Mineralisation extends from the porphyries into their host lithology. The current life of mine plan is focused on five porphyries, referred to as E26, E48, E22, E31 and GRP314; in addition to these zones numerous other mineralised porphyries exist across the district. The deposits are hosted within both the Goonumbla and Wombin Volcanics, with mineralisation-related intrusive rocks effectively forming part of the latter. A schematic depiction of the mineralisation and major rock types encountered at Northparkes is shown in Figure 1.

Sulphide mineralisation occurs in quartz stockwork veins, as disseminations and fracture coatings. Highest grades are generally associated with the most intense stockwork veining. Sulphide species in the systems are zoned from bornite-dominant cores, centred on the quartz monzonite porphyries, outwards through a chalcopyrite-dominant zone to distal pyrite. As the copper grade increases (approximately > 1.2 per cent copper), the content of covellite, digenite and chalcocite associated with the bornite mineralisation also increases. Gold normally occurs as fine inclusions within the bornite; due to the intimate relationship with bornite, visible gold tends to occur within the highest-grade zones of the central portion of the deposit. A small portion of gold mineralisation does not appear to be directly associated with copper sulphide minerals. Silver is associated with copper sulphide minerals and is present in solid solution and as inclusions of silver-bearing tellurides and electrum. Copper-to-gold ratios differ between the different deposits and within individual deposits.

All of the Northparkes deposits are cross-cut by late faults/veins filled with quartz-carbonate and minor gypsum, anhydrite, pyrite, tennantite chalcopyrite, sphalerite and galena, the associated sericite alteration can extend up to 10 m from the faults. Tennantite, which contributes arsenic to the final copper concentrate, is present in higher concentrations in the E48 deposit.

Oxide mineralisation blankets were well developed over the E22 and E27 deposits. The upper blanket was gold-rich and copper-poor. The lower blanket was enriched in copper by supergene processes. The dominant copper oxide minerals at E22 and E27 were copper carbonates (malachite and azurite) and phosphates (pseudomalachite and libethenite) with lesser chalcocite, native copper, cuprite and chrysocolla. A gold-poor, less well developed, supergene copper blanket was also developed over the E26 deposit. At E26 the oxide copper minerals included atacamite, clinoatacamite and sampleite, in addition to those copper minerals observed in E22 and E27.

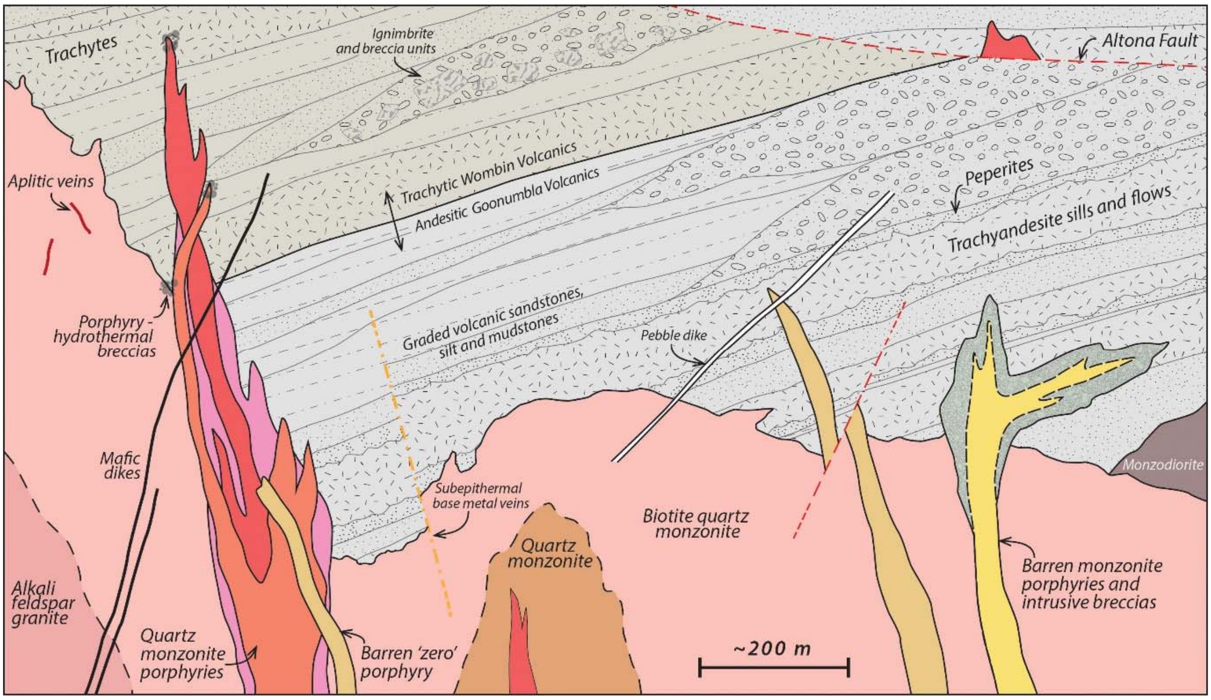

Figure 1: Schematic depiction of the mineralisation and major rock types encountered at Northparkes)

The Northparkes deposits are typical porphyry copper systems, in that the mineralisation and alteration are zoned around multiphase quartz monzonite porphyries. As described by Pacey *et al* (2019) mineralization was caused by the forcible, periodic escape of low-viscosity, crystal- and volatile-rich magmas. These exploited pre-existing structural intersections and focused the discharge of large quantities of magmatic fluids from the underlying chamber. The fluids circulated in intricate fracture networks to produce K-feldspar-sulphide veinlets and quartz sulphide stockwork veins, surrounded by K-feldspar–dominated alteration. Ore grades are exclusively located within the potassic alteration zones, although some have been sericitically overprinted.

Exploration

Exploration activities in the Northparkes area were initially undertaken by the corporate exploration groups of Geopeko and North until 1998. From 1998 onwards, Northparkes has internally managed all exploration in the district, focusing exclusively on the Goonumbla Volcanic Complex. A combination of magnetic gravity and electrical geophysical surveys, bedrock geochemistry, geological interpretation and deep diamond drilling has been used to help discover new porphyry systems, including the GRP314 deposit. Recent exploration activities have provided extensive deep drill coverage in the mine corridor. This has led to the discovery of additional mineralisation at depth beneath existing mining operations at the E22, E26 and E48 deposits.

Drilling

The Northparkes deposits are defined by a series of diamond drill core and reverse circulation drilling intercepts; the majority of diamond drill core is drilled as oriented core. The majority of the Mineral Resource is supported by drill core. Comprehensive downhole geophysical data is collected via several methods, which includes acoustic televiewer, full wafeform and multichannel sonic; density, Gamma-Gamma, dual resistivity and dipmeter.

All diamond drill core, reverse circulation, air core, or grab sample logging is captured electronically with AcQuire to be ultimately housed within the master AcQuire database.

Sampling, Analysis and Data Verification

Sampling of diamond drill core involves sawing samples to obtain half core which is then sampled on two metre lengths for assay. The other half of the core is retained onsite although some samples may be utilized for metallurgical test work.

Reverse circulation samples are collected through a cone splitter at the drill rig. Samples are sampled over a two-metre length, similar to core samples. A duplicate sample is taken at a minimum frequency of 1 in 20 to assess field sampling error.

Samples are sent for sample preparation and Au by fire assay analysis to ALS laboratories in Orange, New South Wales. Analysis for a 48 element suite, including Cu and other base metals, is undertaken by ALS laboratories in Brisbane, Queensland. Samples are received and dried at 105°C for 24 hours in a thermostatically controlled, gas fired oven. All samples are then crushed with 2.5 kg to 3 kg rotary divided off for pulverising. 1 in 20 samples is checked for sizing (80% passing 2mm) as a quality control. A duplicate sample is also collected at this stage of the process at a rate of 1 in 20. The sample is then pulverised and 300 grams sub-sampled and sent for assaying. The pulverised sample is checked to ensure that 90% passed 75µm and duplicates were collected at a rate of 1 in 20.

The initial assay method for Au utilises a trace method fire-assay where 30 grams of pulp is fused in a lead collection fire assay. The prill is digested in aqua-regia and the gold content determined by AAS. The range of this technique is 0.002 to 1ppm. Over-range values are re-analysed using an ore-grade method. The range of the ore-grade analysis is 0.01 to 100ppm.

The assay for base metals uses a 48 element suite (ME-MS61). A sub-sample of the pulp is digested using a HF/multi acid 'Near-Total' digest. Analytes tested are: Ag, Al, As, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cs, Cu, Fe, Ga, Ge, Hf, In, K, La, Li, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Rb, Re, S, Sb, Sc, Se, Sn, Sr, Ta, Te, Th, Ti, Tl, U, V, W, Y, Zn & Zr. An "Ore Grade" OG62 analysis is used to re-assay samples for Cu, for samples assaying higher than 0.4% Cu in the method outlined above. This technique is also a four acid digest, with ICP-AES or AAS finish.

Assay results are reported electronically to Northparkes via email. Where re-assaying due to failed quality assurance and quality control ("**QA/QC**") occurred, the laboratory is required to report the whole batch to Northparkes (including the samples not re-assayed). QA/QC data are reviewed and monitored on a continuous basis.

A comprehensive independent quality control program is implemented by Northparkes as a standard part of each drilling programme, which includes standards, blanks and duplicate samples. A suite of matrix matched Northparkes standards are utilised. Each standard is selected by the logging geologist to match the appropriate level of Cu, Au, and As. Standards are inserted into sample batches at a minimum rate of 1:20. Blanks are also inserted into batches at the rate of 1:20 and consist of locally sourced basalt gravel. Duplicate samples are taken at various stages of sample preparation to assess sampling error; these comprise coarse field duplicates splits of RC samples (1:10); duplicate samples collected after crushing and pulverising (1:20); internal laboratory repeats (1:20) of samples from the same pulp packet and within the same sample batch; and half core duplicates (1:100).

Dry bulk density is measured using two different methods on the same sample – the calliper method (diametric) and a water displacement (immersion) method. Measurements are generally taken at 20 m intervals downhole on diamond drill core. Samples are prepared by cutting 20 cm cylinders of core, rejecting those where substantial chipping occurred when cutting the ends. Samples are weighed after drying in air and then oven dried overnight (~12 hrs) at around 105ºC. The oven dried samples are then cooled and weighed to determine the dry sample weight.

Calliper bulk density measurements are compared with water displacement measurements as a verification step. In the case of samples where the absolute percentage difference between the two methods is more than 5%, the method closest to 2.68 t/m^3 (the average value) is selected as the preferred method, effectively rejecting any erroneous values. For estimation, density values less than 2.40 t/m^3 are excluded and values greater than 3.00 t/m^3 are cut to 3.00 t/m^3.

Mineral Processing and Metallurgical Testing

Metallurgical testwork is performed for each new deposit area as part of the technical studies that are conducted prior to developing a new deposit or cave lift. Metallurgical studies are focused on assessing the ore treatment characteristics of the respective mining area in the Northparkes processing circuit and assessing options to optimise throughput and recovery. Northparkes ore tends to exhibit consistent and predictable metallurgical characteristics and are well understood and characterised. Metallurgical testwork typically includes detailed mineralogical characterisation, comminution testwork (including grindability and abrasivity), locked-cycle floatation on composite samples and dewatering tests.

Arsenic and fluorine are the main penalty elements for Northparkes concentrates and certain offtakers also penalise aluminium (from mica) and magnesium (from carbonates). Northparkes is able to blend its ore sources to manage deleterious elements to minimise penalties and the increased balance of E26 and E22 to ore will positively impact arsenic levels.

Mineral Resource and Mineral Reserve Estimates

Mineral Resources and Mineral Reserves are reported as at 31 December 2020. The Mineral Resource (Table 2) and Mineral Reserve (Table 3) estimates are completed using the latest block models, economic factors, reconciled mining production figures, processing and mining recoveries, and dilution. The estimates have been prepared by Competent Persons in accordance with guidelines and principles of the JORC Code 2012. All Mineral Reserves and Mineral Resources are reported on a 100% attributable basis to Northparkes.

Table 2 Northparkes Mineral Resources

Mineral Resources	Tonnage (Mt)	Copper (% Cu)	Gold (g/t Au)	Silver (g/t Ag)	Copper (Mt Cu)	Gold (Moz Au)	Silver (Moz Ag)
Measured							
E22	10.20	0.43	0.29	2.06	0.04	0.10	0.68
E48L1	1.70	0.39	0.11	1.20	0.01	0.01	0.06
E48L2	90.20	0.54	0.25	1.91	0.49	0.73	5.53
E26L2 Residual	-	-	-	-	-	-	-
E26L3	111.80	0.62	0.15	1.82	0.69	0.55	6.56
GRP314L1	-	-	-	-	-	-	-
GRP314L2	-	-	-	-	-	-	-
E44 - Sulphide	4.30	0.03	1.37	9.82	0.00	0.19	1.36
E44- Oxide	0.70	0.03	0.97	5.78	0.00	0.02	0.12
E31 - Oxide	0.10	0.52	0.38	1.43	0.00	0.00	0.01
Total Measured	**219.00**	**0.56**	**0.23**	**2.03**	**1.24**	**1.60**	**14.32**
Indicated							
E22	4.80	0.37	0.19	1.52	0.02	0.03	0.24
E48L1	-	-	-	-	-	-	-
E48L2	67.40	0.51	0.17	1.77	0.34	0.36	3.84
E26L2 Residual	11.50	0.78	0.15	2.07	0.09	0.06	0.76
E26L3	49.80	0.53	0.12	1.54	0.26	0.20	2.47
GRP314L1	23.00	0.57	0.12	1.74	0.13	0.09	1.28
GRP314L2	46.50	0.54	0.17	1.67	0.25	0.25	2.50
E44 - Sulphide	1.40	0.02	0.96	5.79	0.00	0.04	0.27
E44- Oxide	0.70	0.03	0.93	3.74	0.00	0.02	0.08
E31 - Oxide	0.10	0.38	0.26	1.14	0.00	0.00	0.00
Total Indicated	**205.20**	**0.53**	**0.16**	**1.74**	**1.10**	**1.05**	**11.44**

Measured & Indicated							
E22	15.00	0.41	0.26	1.89	0.06	0.13	0.91
E48L1	1.70	0.39	0.11	1.20	0.01	0.01	0.06
E48L2	157.60	0.53	0.22	1.85	0.83	1.09	9.37
E26L2 Residual	11.50	0.78	0.15	2.07	0.09	0.06	0.76
E26L3	161.60	0.59	0.14	1.73	0.96	0.75	9.02
GRP314L1	23.00	0.57	0.12	1.74	0.13	0.09	1.28
GRP314L2	46.50	0.54	0.17	1.67	0.25	0.25	2.50
E44 - Sulphide	5.70	0.03	1.27	8.83	0.00	0.23	1.63
E44- Oxide	1.40	0.03	0.95	4.76	0.00	0.04	0.20
E31 - Oxide	0.20	0.44	0.33	1.27	0.00	0.00	0.01
Total Measured & Indicated	**424.20**	**0.55**	**0.19**	**1.89**	**2.33**	**2.65**	**25.76**
Inferred							
E22	0.40	0.35	0.19	1.31	0.00	0.00	0.02
E48L1	-	-	-	-	-	-	-
E48L2	-	-	-	-	-	-	-
E26L2 Residual	-	-	-	-	-	-	-
E26L3	-	-	-	-	-	-	-
GRP314L1	22.20	0.59	0.14	1.80	0.13	0.10	1.29
GRP314L2	34.80	0.56	0.22	1.60	0.20	0.24	1.79
E44 - Sulphide	0.04	0.03	0.94	6.20	0.00	0.00	0.01
E44- Oxide	0.10	0.02	0.84	2.30	0.00	0.00	0.01
E31 - Oxide	-	-	-	-	-	-	-
Total Inferred	**57.50**	**0.57**	**0.19**	**1.68**	**0.33**	**0.35**	**3.10**

1) Mineral Resources are reported at cut-off grades between 0.35% and 0.5% copper, depending on the zone and mineralisation type.
2) Rows and columns may not summate due to rounding.
3) Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
4) Mineral Resources are exclusive of those Mineral Resources that have been converted to Ore Reserves (i.e., are in addition to Ore Reserves)

Table 3: Northparkes Ore Reserves

Mineral Reserves	Tonnage (Mt)	Copper (% Cu)	Gold (g/t Au)	Silver (g/t Ag)	Copper (Mt Cu)	Gold (Moz Au)	Silver (Moz Ag)
Proven							
Stockpiles							
Oxide Stockpiles	-	-	-	-	-	-	-
Sulphide	7.67	0.38	0.23	2.17	0.03	0.06	0.53
Subtotal Stockpiles	**7.67**	**0.38**	**0.23**	**2.17**	**0.03**	**0.06**	**0.53**
Open Cut							
E31 N Sulphide	1.12	0.35	0.98	0.88	0.00	0.04	0.03
E31 N Oxide	1.21	0.34	1.09	0.94	0.00	0.04	0.04
E31 Sulphide	0.75	0.75	0.79	2.79	0.01	0.02	0.07
Subtotal Open Cut	**3.08**	**0.44**	**0.98**	**1.37**	**0.01**	**0.10**	**0.14**
Underground							
E22	-	-	-	-	-	-	-
E26	7.01	0.71	0.18	1.84	0.05	0.04	0.42
E48	8.11	0.47	0.12	1.62	0.04	0.03	0.42
Subtotal Underground	**15.13**	**0.58**	**0.15**	**1.72**	**0.09**	**0.07**	**0.84**
Total Proven	**25.88**	**0.51**	**0.27**	**1.81**	**0.09**	**0.07**	**0.84**
Probable							
Stockpiles							
Oxide Stockpiles	-	-	-	-	-	-	-
Sulphide	-	-	-	-	-	-	-
Subtotal Stockpiles	-	-	-	-	-	-	-
Open Cut							
E31 N Sulphide	-	-	-	-	-	-	-
E31 N Oxide	-	-	-	-	-	-	-
E31 Sulphide	0.37	0.39	0.29	1.30	0.00	0.00	0.02
Subtotal Open Cut	**0.37**	**0.39**	**0.29**	**1.30**	**0.00**	**0.00**	**0.02**
Underground							
E22	42.35	0.52	0.39	2.45	0.22	0.53	3.34
E26	48.78	0.61	0.10	1.69	0.30	0.16	2.65
E48	11.76	0.42	0.11	1.38	0.05	0.04	0.52
Subtotal Underground	**102.89**	**0.56**	**0.22**	**1.97**	**0.57**	**0.73**	**6.51**
Total Probable	**103.26**	**0.55**	**0.22**	**1.97**	**0.57**	**0.73**	**6.53**
Proven & Probable							

Stockpiles							
Oxide Stockpiles	-	-	-	-	-	-	-
Sulphide	7.67	0.38	0.23	2.17	0.03	0.06	0.53
Total Stockpiles	**7.67**	**0.38**	**0.23**	**2.17**	**0.03**	**0.06**	**0.53**
Open Cut							
E31 N Sulphide	1.12	0.35	0.98	0.88	0.00	0.04	0.03
E31 N Oxide	1.21	0.34	1.09	0.94	0.00	0.04	0.04
E31 Sulphide	1.12	0.63	0.62	2.30	0.01	0.02	0.08
Total Open Cut	**3.45**	**0.44**	**0.90**	**1.36**	**0.02**	**0.10**	**0.15**
Underground							
E22	42.35	0.52	0.39	2.45	0.22	0.53	3.34
E26	55.79	0.63	0.11	1.71	0.35	0.20	3.07
E48	19.88	0.44	0.11	1.48	0.09	0.07	0.94
Total Underground	**118.02**	**0.56**	**0.21**	**1.94**	**0.66**	**0.80**	**7.35**
Total Proven & Probable	**129.14**	**0.55**	**0.23**	**1.94**	**0.70**	**0.95**	**8.04**

1) The following commodity prices and exchange rate assumptions have been applied in the report of Mineral Reserves: copper – US$2.75/lb, gold US$1,250/oz and 0.73 A$ to US$.
2) Rows and columns may not summate due to rounding.

Validated raw drilling data was composited to top-down, 4 m run-length composites for all data, respecting key geological boundaries, which include: base of oxidation, "zero" porphyry, "half" porphyry and the Altona fault zone. Statistical analysis is conducted for each deposit and domain; grade distributions are not particularly skewed, with co-variances generally less than 2.0, with the exception of arsenic. Limited capping of high grades is required for copper, gold and silver. Variograms are developed for major and minor elements and bulk density for each deposit and domain. Block models are developed which appropriately account of the different lithologies. Copper, gold, silver, bulk density and several deleterious elements are estimated, using ordinary kriging, in to 20 m × 20 m × 20 m sized blocks for each deposit and domain, using appropriate search parameters. Open pit deposits use a more tabulated block size where appropriate. Estimates are validated using various standard techniques, which include visual assessment, swath plots, statistical analysis and contacts plots. Mineral Resource classification is conducted on the basis of the data spacing, estimation parameter and the slope of regression and considers the quality of the underlying data, geological confidence, the quality of the estimator and the uncertainty in the final recoverable estimates. Mineral Resource are constrained by practical mining volumes and are reported at appropriate cut-off grades.

Block cave Mineral Reserves are generate using GEMS PCBC software; which has been employed at Northparkes since the underground mine commenced and is considered industry standard. Detailed analysis of geotechnical parameters is undertaken for each block cave, that include: caveability, fragmentation and subsidence.

PCBC reserve analysis for block cave mining operations is based on a shut-off grade derived from Northparkes site shut-off value and the revenue factor. A similar approach is applied for sub-level caving mining areas. In the block and sub-level cave mines, PCBC and PCSLC allows for dilution based on the mixing algorithms used. Blocks below cut-off are mixed and drawn with blocks above cut-off, until the overall grade of the material reporting to the draw point is below the shut-off value. Cellular Automaton flow modelling was undertaken for the existing E26 caves to provide the residual block model and provide a spatial estimate of the remaining tonnage and grades within the cave. Stockpiles are segregated into discrete volumes based on copper grade and are reconciled to production. Open pit Mineral Reserves are constrained by a pit design. A summary of the changes is presented in Table 4.

Table 4: Comparison of Previous Mineral Reserve and Mineral Resources Statements

Category	Tonnes (kt)		Grades (%Cu)		(Au g/t)		(Ag g/t)		Changes Tonnes (%)	Cu Grade (%)	Au Grade (%)	Ag Grade (%)
	2020	2019	2020	2019	2020	2019	2020	2019				
Mineral Reserve												
Proven	25,880	24,120	0.51	0.52	0.27	0.26	1.81	1.73	7%	-2%	4%	5%
Probable	103,260	108,710	0.55	0.56	0.22	0.21	1.97	1.95	-5%	-2%	5%	1%
Proven & Probable	**129,140**	**132,830**	**0.55**	**0.55**	**0.23**	**0.22**	**1.94**	**1.91**	**-3%**	**-0%**	**5%**	**2%**
Mineral Resource												
Measured	219,000	220,500	0.56	0.56	0.23	0.23	2.03	2.03	-1%	0%	0%	0%
Indicated	205,200	135,980	0.53	0.53	0.16	0.16	1.74	1.76	51%	0%	0%	-1%
Measured & Indicated	**424,200**	**356,480**	**0.55**	**0.55**	**0.20**	**0.20**	**1.89**	**1.90**	**19%**	**0%**	**0%**	**-1%**
Inferred	57,500	126,970	0.57	0.56	0.19	0.17	1.68	1.69	-55%	2%	12%	-1%

Mining Operations

Underground Operations

Block cave mining accounts for the majority of ore production at Northparkes, with minor contributions from surface stockpile reclamation and open pit mining, on a campaign basis. Preproduction mining development work consists of establishing two working levels, the undercut level and extraction level, at the base of each ore block, as well as the development to support the associated material handling system. Northparkes has developed its own unique extraction level layout that locates the material handling system, including crusher, to the side of the extraction level, thereby alleviating the need to construct a third level dedicated to haulage. Similarly, it has established the extraction level as the primary ventilation level, thereby eliminating development to support mine ventilation. The undercut level, which is used to initiate caving, is 14 - 20 m vertically above the extraction level, the height being dependent on the undercutting method. Undercutting, which involves sequential firings of overlapping fans of blastholes to create the initial void for caving, is the rate controlling step for production ramp-up, controlling both the rate of undercutting ore and the start of production from drawpoints.

Northparkes has established comprehensive geotechnical models for all of its block cave mines, based on geotechnical logging of extensive diamond drill core data sets, augmented by mapping of underground openings established during the early study phases. The Northparkes rock mass, including the E48 and E26 deposits, is a highly jointed rock mass with fracture frequencies of between three and 20/m and fracture density that increases with copper grade.

Mine access for all personnel and equipment is provided by surface portal and decline. The decline has a standard 5 m wide by 5.5 m high arched profile. The hoisting shaft represents the second means of egress and the ore skips can be fitted with a man-riding cage in the event that personnel cannot egress the mine via the decline. The mining process involves recovery of broken rock from the drawpoints by 14 t capacity electric LHDs, which tram the ore to a primary crushing station, consisting of plate feeder and jaw gyratory crusher, located on the margin of the extraction level. Typically, four to five LHDs operate on a continuous basis. E48 Lift 1 is highly automated, utilising driverless loaders. Crushed ore is fed onto high-speed inclined conveyors via an ore pass that also provides storage capacity. Ore is conveyed to the underground loading station, which consists of three ore passes feeding the hoisting system. The hoisting system consists of a ground-mounted friction winder with integrated drum and rotor, servicing two 18 t payload skips in counterbalance, running on rope guides in the 6 m diameter concrete lined shaft. Hoisted ore is transferred via an overland conveyor to crushing cicuit located. The hoisting system is planned to be upgraded to facilitate the expansion to 7.6 Mtpa.

Northparkes has developed a comprehensive cave management system based on its experiences with operating the E26 block caves. These management systems are designed to manage the specific catastrophic safety risks particular to block caves; namely airblast, surface subsidence and inrush and large-scale rock falls. The system is also designed to support maximising reserve recovery and optimising mine production. The system is based on a large number of monitoring systems, including real-time microseismic event monitoring, open hole surveys using probes and video cameras, time domain reflectometers installed in grouted boreholes, convergence monitoring using extensometers and manual measurements of mine openings on the extraction level and in key underground infrastructure, drawpoint fragmentation and geology mapping, drawpoint grade sampling, subsidence zone volume surveys and water inflow measurements.

The mine ventilation system consists of two primary exhaust shafts (E26 and E48) each with two fans mounted on surface above a system of vertical and lateral return airways. The primary air intakes are the main decline, the hoisting shaft and E48 intake shaft. The ventilation system typically operates at airflows of 600 - 650 m^3 per second, which are shared across the various work areas.

Water inflows to the mine are relatively modest; of the order of 3 to 5 L/s. Dewatering systems are installed at the base of each extraction level and are designed to cope with large inflows from the cave volume and subsidence zone.

Open Pit Operations

Open cut mining has been used to access the near-surface portions of the copper-gold deposits at Northparkes, initially to allow accelerated ore processing prior to commissioning of underground operations, but also to supplement underground production during the transition from one cave to another. As a result, open cut mining has typically been undertaken on a campaign basis, often relying upon contract mining.

Processing and Recovery Operations

Northparkes operates a conventional flow sheet for ore processing, which consists of four stages: crushing, grinding, flotation and thickening/filtering. The plant was commissioned in September 1995 and designed to process both copper gold oxide and sulphide ore; the cyanide / oxide processing circuity was decommissioned in 1996. The comminution process consists of two parallel grinding modules and a single line flotation plant consisting of a SAG, ball and tertiary mills:

- Module 1: 2.8 MW SAG mill with a pebble crushing circuit followed by a 2.8 MW primary ball mill and 1.3 MW tertiary ball mill; throughput rates vary between 280 tph with a flotation feed of 90 Rm and 310 tph with a flotation feed of 115 Rm; and

- Module 2: 4.9 MW SAG mill with two pebble crushers followed by a 4.9 MW primary ball mill and a 1.6 MW tertiary ball mill; feed rates vary between 480 tph with a flotation feed of 115 Rm and 510 tph with a flotation feed of 130 Rm.

Copper and gold bearing sulphide minerals are recovered using CMS as the primary flotation collector and Interfroth as the frother by using a range of reagents. Concentrate produced from the flotation circuit is thickened and filtered to produce a final concentrate, with a moisture content of 7-10%. Average life of mine processing recoveries are expected to be 88% for copper, 77% for gold and 82% for silver, which is consistent with historical operating performance.

Since 2017, the plant has been operating at a capacity of 6.4 Mtpa. The plant capacity has recently been expanded to 7.6 Mtpa with final commissioning underway. The expansion project comprises:

1) the installation of a closed loop secondary & tertiary crushing circuit to replace the existing open circuit secondary crusher;

2) upgrading of the feed conveyors, discharge screens, hoppers, cyclone clusters and pumps;

3) Relocation of existing pre flotation cell, installing a new flotation cell and refurbishing the cleaner scavenger cells.

Copper concentrate is loaded into 26 t capacity lidded steel containers in a covered concentrate storage facility in the processing plant. The loaded containers are transported by road freight from the mine site to the Goonumbla rail siding, approximately 15 km from the mine. The containers are stored at the siding before being railed to Port Kembla. Each trainload contains approximately 1,500 t of concentrate. The containers are stacked at the port and the concentrate loaded directly into ships in approximately 10,000 t cargo lots for shipping to custom smelters, predominantly in Japan and China.

Infrastructure, Permitting and Compliance Activities

Northparkes infrastructure includes:

- underground mining operations, decline and hoisting shaft;

- an overland conveyor to transport ore from hoisting shaft to the ore processing plant;

- ore processing plant, including surface crusher, crushed ore stockpiles, active grinding mills, froth flotation area and concentrate storage;

- tailings storage facilities (“**TSF**”) (described below);

- water management systems, which include: watercourses, farm dams, settlement, retention and stilling ponds, the caloola dams, the process water dam and the return water dam;

- site offices, training rooms, a vehicle wash down area and workshop facilities; and

- significant electrical and water infrastructure between Parkes and Northparkes.

Across the 25 year operation 135 Mt of tailings has been deposited at the Northparkes operations to date, within TSF1, TSF2, Estcourt TSF, Rosedale TSF and the Infill TSF, located within 2 km from the processing plant. Tailings are sub-aerially deposited into the active TSF, with tailings liquid and runoff contained and directed to the decant towers. Future tailings deposition strategy involves alternating deposition between the Estcourt TSF, Rosedale TSF, TSF Infill and TSF1 Closure. Northparkes utilises a combination of upstream, downstream and centre-line dam construction methods. In 2018, CMOC completed a Tailings Program, which saw a panel of experts review the design and construction of tailings facilities at Northparkes. The TSF are fully compliant with local regulations and acknowledged for several leading practices.

Northparkes has been operating since 1993 following the grant of the original development consent (DA504/90) by the NSW Land and Environment Court. Northparkes operates with all necessary state and federal approvals and benefits from a strong environmental track record and relationship with local stakeholders.

In accordance with licence and approval requirements, Northparkes conducts an annual review which provides a summary of actual operational and environmental management activities, community relations, mine development and rehabilitation undertaken at Northparkes during the reporting period. Northparkes has developed and implemented a Health, Safety and Environment Management System. The environmental related system components and policy are compliant with ISO14001.

Capital and Operating Costs

Capital projects at Northparkes comprise the 7.6 Mtpa expansion project, E26L1N development, extension to the Estcourt TSF, an upstream lift at the Rosedale TSF and a TSF buttress, in addition to sustaining capital, as summarised in Table 5.

Table 5 Capital Expenditure Summary

Type (US$000,000)	2021	2022	2023
Pre-operating Mine Development	49.9	19.1	20.6
Improvements & Expansion	25.8	29.0	11.1
Study & Sustaining	27.2	28.8	9.5

Northparkes is a highly productive, low-cost copper producer; average unit operating costs over the life of mine are approximately:

- Mining: US$5.30/t (underground) and US$3.80/t (open-pit)
- Processing: US$9.30/t
- G&A: US$3.60/t

Exploration, Development, and Production

Northparkes is undergoing an expansion of throughput capacity from 6.4 Mtpa to 7.6 Mtpa. Project scope includes modifications, upgrades and replacements to operating facilities, currently under construction includes upgrades across each of the operating facilities to achieve throughput increase to 7.6 Mtpa;,

The E26L1N block cave is currently being developed, with production commencing from 2021 and completion scheduled for the second half of 2022. Ore will be crushed and conveyed to the existing underground ore bins that feed the hoisting system and will be processed through the existing surface processing plant.

The Northparkes District has a strong history of exploration success on the Mining Leases since the 1970's, with four porphyry Cu-Au deposits having been mined to date. New deposits continue to be discovered, e.g., GRP314 (2002), and the Mining Lease areas are still considered highly prospective. Drilling coverage, especially at depth and beneath the Altona Fault, is sparse away from the known deposits. Current exploration and evaluation activities are focussed on identifying and defining resources that can support a mine expansion. Recent exploration activities in the Mining Leases have been focused on GRP314, E31, E28, E26L1N and E22, predominantly for infill drilling and characterisation purposes.

Regional aircore geochemical drilling has been undertaken on the various Exploration Licences to explore for and evaluate early stage prospects. Closed-spaced ground gravity surveys are being undertaken in the vicinity of the Mining Leases and surrounding Exploration Licenses A high-level detailed hyperspectral survey covering all of the Northparkes tenement package has also been acquired.