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El Palmar gold-copper discovery, northern Ecuador

Drilling intersects porphyry copper system in a large magnetic complex

Visible chalcopyrite supported by pXRF results; Large magnetic body which hosts the mineralisation measures at least 1km vertically with large lateral extent

Key Points

- Drill hole EPDD026 has intersected a porphyry copper system at depth in the domain where the T2 and T3 targets merge.
- The assessment is based on logging of porphyry stockwork veining, visible chalcopyrite distribution and rock alteration and is supported by pXRF results; Assays are pending
- The mineralised interval is now >200m wide (down hole) from 1,060m and remains open with the key characteristics strengthening as it extends. As the drillhole is still in mineralised porphyry drilling is continuing beyond the current depth of 1360m
- The hole is believed to have intersected an extensive magnetic complex which is interpreted to have a vertical extent of greater than 1,000m extending towards surface, and a large lateral extent
- Importantly, this magnetic body sits within the broad Toachi fault zone which is a key control on mineralisation at SolGold's Cascabel project just 65km away

Sunstone Metals Ltd (ASX: STM) is pleased to announce that drilling at the T2 porphyry target within its El Palmar porphyry gold-copper project in northern Ecuador has intersected a porphyry copper system.

The intersection is in the area where targets T2 and T3 merge and strengthens as the hole extends, suggesting T3 hosts the most prospective part of the system.

Widespread chalcopyrite distribution, transitional potassic alteration, copper-sulphide-bearing A vein and B vein stockworks, and anomalous copper readings in pXRF results confirm the porphyry copper system, however assays are pending. The presence of magnetite veins at depth also give confidence that this system correlates with a large cluster of magnetic bodies at the T3 target. The buried T3 magnetic complex has a lateral footprint more extensive than the T1 magnetic target footprint (Figures 1 and 3).

While drill hole EPDD026 has intersected this system at depth it does open up a very large target space for follow-up drilling across the extensive T3 target to establish the scale of this porphyry discovery (Figure 1).

It is interpreted that the T3 mineralisation intersected at depth in EPDD026 extends towards surface. Surface exploration at T3 has identified stockwork veining in minor local outcrops, but the majority of the area is hidden by thick $(0 - ^15m)$ young volcanic cover. Grid-based auger soil sampling that has penetrated below this cover has returned coincident arsenic and antimony anomalies over the southern sector of the T3

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magnetic complex. These two elements are typically elevated in the altered lithocaps over the top and margins of porphyry copper systems.

Assays are expected to be returned from EPDD026 in batches over the next 4-6 weeks.

The T3 target is centred on the regionally-significant Toachi Fault zone and its intersection with orthogonal structures – a scenario strongly similar to the 3 billion-tonne Alpala copper-gold porphyry deposit, within SolGold's Cascabel project, located 65km to the north-east. Age dating of the rocks associated with mineralisation at El Palmar T1 has confirmed that they are the same geological age as Alpala.

Sunstone Managing Director Malcolm Norris said: "Drill hole EPDD026 has tested three targets, firstly the upper gold anomalous zone at T1-T2 drilled in holes EPDD022, 23 and 24, secondly the large MT geophysical anomaly in the southern part of the T2 target at an intermediate depth, and thirdly at depth on the northwest margin of the large cluster of magnetic bodies that make up the T3 target.

"It is in this third environment on the margin of the T3 magnetic complex that an extensive porphyry system is now being intersected.

"While it is early days, it is very exciting to have identified a mineralised porphyry copper system at T3 and to have identified a very large domain of potential mineralisation extending towards surface defined by magnetic bodies".

El Palmar is located in northern Ecuador in the same regional structural belt that hosts the 2.66Bt Alpala copper-gold deposit grading 0.25g/t gold and 0.37% copper, and the 0.53Bt Tandayama-America deposit grading 0.19g/t gold and 0.24% copper, within the Cascabel project (Figure 7; see also <u>www.solgold.com.au</u> for details), and in the vicinity of the 1Bt Llurimagua copper-molybdenum porphyry deposit grading 0.89% copper and 0.04% molybdenum.

Sunstone is also active at its southern Ecuador Bramaderos project where drilling with two drill rigs is in progress at the Limon target. The drilling is following up the exciting results from LMDD017 (177m at 0.97g/t gold and 10.1g/t silver), and visible gold in LMDD020 (see ASX announcements dated 29 March 2023 and 14 April 2023).



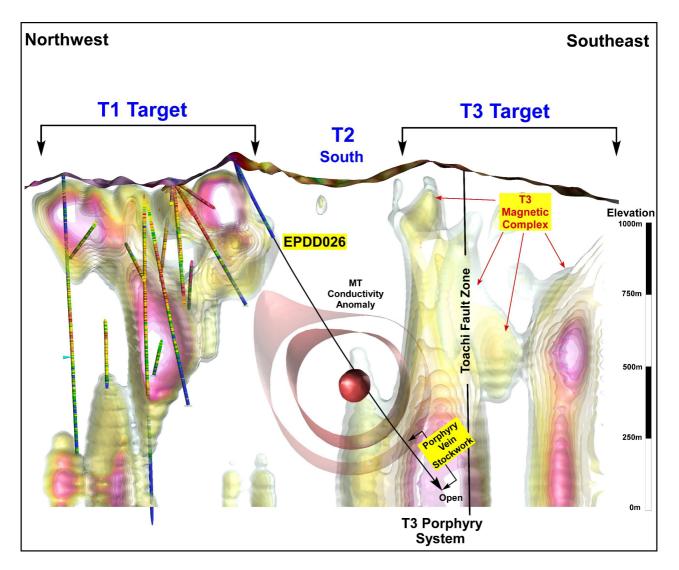


Figure 1: Northwest-Southeast section through the T1, T2 and T3 targets, showing the T1 system which is mineralised from surface on the left of the diagram, and the trend of EPDD026, through the T2 MT geophysical anomaly, and into the T3 magnetic anomalies.





Figure 2: Drill core from EPDD026 over the interval 1270 – 1314m showing strong stockwork veining.



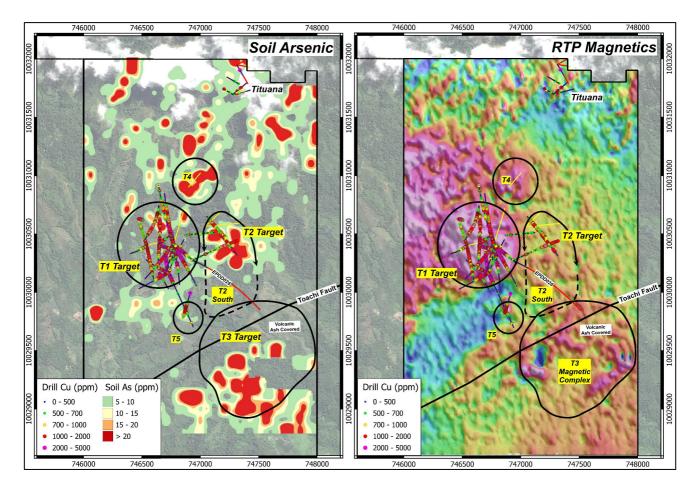


Figure 3: El Palmar project showing porphyry cluster capturing targets T1, T2, T3, T4 and T5. The T3 target is defined by a complex cluster of magnetic bodies coincident with auger soil anomalies of arsenic and antimony. The buried T3 magnetic complex has a lateral footprint more extensive than the T1 magnetic target footprint.



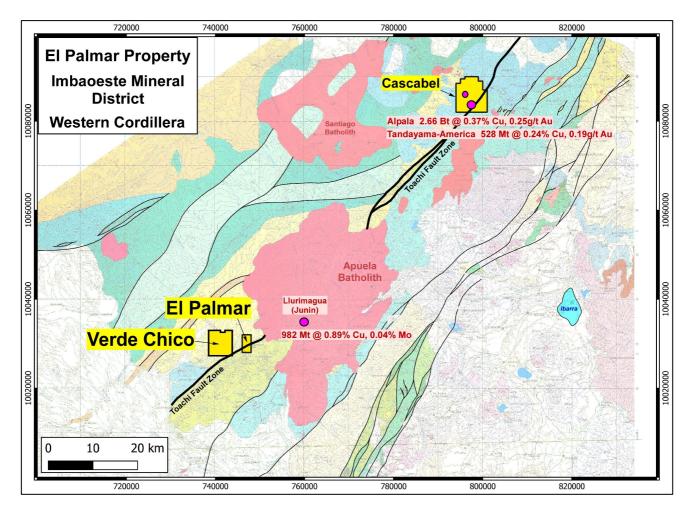


Figure 4: Location of the El Palmar project relative to the giant Llurimagua, Alpala and Tandayama-America (Cascabel project) porphyry deposits, and the Toachi fault system.





Figure 5: Location of the El Palmar project in northern Ecuador, the Verde Chico project nearby, and the Bramaderos Project in southern Ecuador.

Drill Hole ID	Easting (m)	Northing (m)	Dip (degrees)	Azimuth (UTM) (PSAD56 Grid) (degrees)	EOH (m)
EPDD026	746936	10030272	-65	115	Drilling in progress

Table 1: Drill hole details for the El Palmar Project.



For further information, please visit www.sunstonemetals.com.au

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About Sunstone Metals

Sunstone has an advanced portfolio of exploration projects in Ecuador. The portfolio comprises:

 The Bramaderos Gold-Copper Project where Sunstone owns an 87.5% interest with Cornerstone Capital Resources, a subsidiary of SolGold, holding 12.5% (see ASX announcement dated 10th April 2017, 28th August 2019, and 7 January 2020). The Bramaderos gold-copper project is located in Loja province, southern Ecuador, and is highly prospective for the discovery of large porphyry gold-copper systems, and high-grade epithermal gold systems. The Bramaderos concession is host to multiple fertile mineralised systems with significant discovery potential.

The Brama-Alba deposit, within the Bramaderos concession contains an initial Mineral Resource estimate of 156Mt at 0.53g/t AuEq for 2.7Moz gold-equivalent*. In addition to this is the Bramaderos project Exploration Target of between 3.3Moz and 8.6Moz AuEq within 255 to 360Mt at a grade between 0.40 and 0.74g/t AuEq (see ASX release dated December 13, 2022).

The company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement for the Mineral Resource estimate and Exploration Target referred to above and, that all material assumptions and technical parameters underpinning the estimates continue to apply and have not materially changed. The company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.

The potential quantity and grade of the Exploration Target is conceptual in nature. There has been insufficient exploration to estimate a Mineral Resource for the target area reported. It is uncertain if further exploration will result in the estimation of a Mineral Resource.

*The gold equivalent calculation formula is AuEq(g/t) = (Au grade x Au price x Au recov / 31.1035) + (Ag grade x Ag price x Ag recov / 31.1035) + (Cu grade x Cu price x Cu recov / 100)) / (Au price x Au recov / 31.1035). The prices used were US\$1,800/oz gold and US\$9,500/t copper and US\$22/oz silver. Recoveries are estimated at 89% for gold, 85% for copper, and 60% for silver based on metallurgical studies. In Sunstone's opinion all the elements included in the metal equivalents calculation have reasonable potential to be recovered and sold.

2. The El Palmar Copper-Gold Project where Sunstone holds 70% of the highly prospective 800ha El Palmar gold-copper porphyry project in Ecuador. Sunstone can acquire 100% through a Staged Acquisition Agreement. A Staged Acquisition Agreement to acquire the nearby Verde Chico Project has also been signed. The El Palmar and Verde Chico gold-copper projects are located in Imbabura province, northern Ecuador, within the same geological belt that includes the giant Alpala, Tandayama-America and Llurimagua porphyry copper-gold and copper-molybdenum deposits.

Competent Persons Statement

The information in this report that relates to exploration targets and exploration results is based upon information reviewed by Dr Bruce Rohrlach who is a Member of the Australasian Institute of Mining and Metallurgy. Dr Rohrlach is a full-time employee of Sunstone Metals Ltd and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Dr Rohrlach consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

Mr Malcolm Norris, Managing Director of Sunstone Metals Ltd., has authorised this announcement to be lodged with the ASX.

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TABLE 1 – Section 1: Sampling Techniques and Data

Criteria	JORC Code explanation	Commentary
Sampling techniques	• Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as downhole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.	 The drill core sampling was carried out using half core, generally at 1 to 2m intervals. New results are based on visual assessment of drill core.
	• Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	• Core recovery was good, and core aligned prior to splitting and sampling.
	• Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	• Diamond drilling, rock chip and channel sampling points have been guided by geological mapping. The drill samples from El Palmar were dried, crushed to 70% passing 2mm, Split 1000g and pulverised to 85% passing 75microns. A 20g portion of this sample was used for multi-element analysis (IMS-230) and a 30g sample for Fire Assay Au (FAS-111).
Drilling techniques	• Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).	• The El Palmar target areas have been drilled with diamond core.
Drill sample recovery	• Method of recording and assessing core and chip sample recoveries and results assessed.	• Diamond core recovery data for the El Palmar drilling program was good.
,, ,	• Measures taken to maximise sample recovery and ensure representative nature of the samples.	• Core recovery at El Palmar was good.
	• Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.	• No relationship between sample recovery and grade has been established.
Logging	• Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.	• Drill samples were logged for lithology, weathering, structure, mineralogy, mineralisation, colour, and other features. Recent logging and sampling for the El Palmar project were carried out according to Sunstone's internal protocols and QAQC procedures which comply with industry standards.
	• Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	• Drill samples are logged for lithology, weathering, structure, mineralogy, mineralisation, colour, and other features.
	• The total length and percentage of the relevant intersections logged.	• The drill holes have been logged in full. Drill hole lengths are included in the text of the announcement.
Sub-sampling techniques and	• If core, whether cut or sawn and whether quarter, half or all core taken.	• Half core was used to provide the samples that were submitted for assay from the El Palmar drilling.
sample preparation	• If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	• This announcement relates to drill core logging.
	• For all sample types, the nature, quality and appropriateness of the sample preparation technique.	 Historical drill core samples from El Palmar (drilled by Codelco) were analysed by ACME Labs in Vancouver. Samples were crushed and split with 250 grams pulverized to 200 mesh (Method - R200-250). Analysis on drill core was undertaken on a sample split (Method - VAN split pulp).
		• Surface rocks at El Palmar are historical and were collected by 3 different companies. GOEX S.A. samples were analysed at Bureau Veritas Laboratories



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Criteria	JORC Code explanation	Commentary
		 in Peru. Lowell Mineral Exploration rocks were analysed by ALS Minerals, with sample preparation involving fine crushing 70% passing 2mm (Method CRU-31), crushed sample split (Method SPL-21) and pulverise 1000g to 85% passing 75um (Method PUL-32). Codelco surface rock samples were analysed by ACME Labs in Vancouver. Samples were crushed and split with 250 grams pulverized to 200 mesh (Method - R200-250) The sample preparation for the current phase of drilling is carried out according to industry standard practices using highly appropriate sample preparation techniques.
	• Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	 Sunstone used an industry standard QAQC programme involving Certified Reference Materials "standards" and blank samples, which were introduced in the assay batches. Standards (Certified Reference Materials) or analytical blanks were submitted at a rate of 1 in 28 samples. Field duplicates were also taken at a rate of approximately 1 in 28 samples. The check or duplicate assay results are reported along with the sample assay values in the final analysis report.
	• Measures taken to ensure that the sampling is representative of the in-situ material collected, including for instance results for field duplicate/second-half sampling.	 For diamond core, the routine sample procedure is to always take the half/quarter core to the right of the orientation line (looking down hole) or the cut line (in cases where the orientation line was not reliable). Once assay results are received the results from duplicate samples are compared with the corresponding routine sample to ascertain whether the sampling is representative.
	• Whether sample sizes are appropriate to the grain size of the material being sampled.	• Sample sizes are considered to be appropriate for the style of sampling undertaken and the grainsize of the material, and correctly represent the style and type of mineralisation at the exploration stage.
Quality of assay data and laboratory tests	• The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.	 Sunstone uses a fire assay gold technique for Au assays (FAS-111) and a four acid multi element technique (IMS-230) for a suite of 48 elements. FAS-111 involves Au by Fire Assay on a 30-gram aliquot, fusion and atomic absorption spectroscopy (AAS) at trace levels. IMS-20 is considered a near total 4 acid technique using a 20g aliquot followed by multi-element analysis by ICP-AES/MS at ultra-trace levels. This analysis technique is considered suitable for this style of mineralisation.
	• For geophysical tools, spectrometers, handheld XRF instruments, etc., the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.	• A handheld pXRF instrument is used on site for verification of anomalous metal values and to assist with the geological logging and mineral identification. No specific data from this instrument are referenced in this announcement.
	• Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	 Standards, blanks and duplicates are inserted ~1/28 samples. The values of the standards range from low to high grade and are considered appropriate to monitor performance of values near cut-off and near the mean grade of the deposit. The check sampling results are monitored, and performance issues are communicated to the laboratory if necessary.
	• The verification of significant intersections by either independent or alternative company personnel.	• Procedure checks have been completed by the Competent Person for exploration results for this announcement.



Criteria	JORC Code explanation	Commentary		
Verification of	• The use of twinned holes.	• Twin holes have not been drilled in these areas.		
sampling and assaying	• Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	• Sunstone sampling data were imported and validated using Excel.		
	• Discuss any adjustment to assay data.	• Assay data were not adjusted. Core loss intervals are assigned assay values of zero where present.		
Location of data points	• Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.	• Sample co-ordinates are located by GPS and for trench samples measured along the length of the trench.		
	• Specification of the grid system used.	Ecuador projection parameters:		
		Parameter Value		
		Reference Ellipsoid International 1924		
		Semi Major Axis		
		Inverse Flattening (1/f)		
		Type of Projection UTM Zone -17S (Datum PSAD56)		
		Central Meridian: -81.0000		
		Latitude of Origin 0.0000		
		Scale on Central Meridian 0.9996		
		False Northing 10000000		
		False Easting 500000		
	• Quality and adequacy of topographic control.	• The topographic control was compared against published maps and satellite imagery and found to be good quality.		
Data spacing and distribution	• Data spacing for reporting of Exploration Results.	• The drill core samples reported were collected from diamond drill holes from the El Palmar targets, and with sample length generally ranging between 0.5-2m.		
	• Whether the data spacing, and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.	• The data from these samples does not contribute to any resource estimate nor implies any grade continuity.		
	• Whether sample compositing has been applied.	No sample compositing was done.		
Orientation of data in relation to geological structure	• Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	 Drilling orientations were appropriate for the interpreted geology providing representative samples. Trench orientations and rock chip locations were appropriate for the interpreted geology providing representative samples. 		
	• If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.	• No sampling bias is expected at this stage.		
Sample security	• The measures taken to ensure sample security.	 Sunstone sampling procedures indicate individual samples were given due attention. Sample security was managed through sealed individual samples and sealed bags of multiple samples for secure delivery to the laboratory by permanent staff of the joint venture. MS Analytical is an internationally accredited laboratory that has all its internal procedures heavily scrutinised in order to maintain their accreditation. MS 		



Criteria	JORC Code explanation	Commentary
		Analytical is accredited to ISO/IEC 17025 2005 Accredited Methods.
Audits or reviews	• The results of any audits or reviews of sampling techniques and data.	 Sunstone's sampling techniques and data have been audited multiple times by independent mining consultants during various project assessments. These audits have concluded that the sampling techniques and data management are to industry standards. All historical data has been validated to the best degree possible and migrated into a database.

TABLE 1 – Section 2: Exploration Results

Criteria	JORC Code explanation	Commentary
<i>Mineral tenement and land tenure status</i>	• Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.	 The El Palmar property is located in Imbabura province and is held by an Ecuadorian registered company 'GOEX'. Due diligence to date show that there are no wilderness areas or national parks or areas of environmental significance within or adjoining the concession area. There are no native title interests. Sunstone and GOEX have entered into a Staged Acquisition Agreement where Sunstone may earn up to 100% based on defined milestones.
	• The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.	The El Palmar exploration concession was granted in 2003 and is held 100% by GOEX.Sunstone owns 70% of GOEX
Exploration done by other parties	• Acknowledgment and appraisal of exploration by other parties.	 The historic exploration at El Palmar was completed by various groups over the period 1990's, 2007-2008, 2011- 2012 and GOEX (2012 to 2020). Most of the readily available historic data has been acquired and compiled into databases and a GIS project. Exploration by other parties has included stream sediment surveys, geological mapping, rock chip sampling, some local soil sampling, channel sampling and limited diamond drilling (3 holes).
Geology	• Deposit type, geological setting and style of mineralisation.	• The deposit style being explored for includes intrusion- related and stockwork hosted porphyry Au-Cu systems plus epithermal gold-silver-polymetallic veins. The setting at El Palmar is a volcanic arc setting of Miocene or Eocene age intrusions.
Drill hole Information	 A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes: a. easting and northing of the drill hole collar b. elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar c. dip and azimuth of the hole d. down hole length and interception depth e. hole length. 	 Details of the samples discussed in this announcement are in the body of the text. See Figures 1-3 for the location of historical drilling at El Palmar.
	• If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.	• Information included in announcement.



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Criteria	JORC Code explanation	Commentary
Data aggregation methods	• In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.	 Weighted averages were calculated over reported intervals according to sample length. No grade cut-offs were applied.
	• Where aggregate intercepts incorporate short lengths of high-grade results and longer lengths of low-grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.	 Aggregating of intervals represent broad intervals consistent with porphyry gold-copper mineralised systems.
	• The assumptions used for any reporting of metal equivalent values should be clearly stated.	• Metal equivalents are not presented.
Relationship between mineralisation	• If the geometry of the mineralisation with respect to the drill-hole angle is known, its nature should be reported.	• The geometry of the mineralisation relative to the drill holes is not completely known at this stage of exploration.
widths and intercept lengths	• If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	• True widths of mineralised lodes are not known at this stage.
Diagrams	• Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported. These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.	 See Figures 1-3 for maps showing distribution of samples.
Balanced reporting	• Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.	• Figures 1-3 above shows the current interpretations of geology.
Other substantive exploration data	• Other exploration data, if meaningful and material, should be reported) including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	• Figure 1-3 above shows various datasets that are being used to identify target areas and to guide current and future drilling.
Further work	• The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).	• The planned exploration program is outlined in the announcement.
	• Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	• See Figures 1-3 which show areas for further exploration.