MINERALS

Excellence in Exploration

**ASX Code: IPT** 

# **ASX ANNOUNCEMENT**

Date: 16<sup>th</sup> February 2021 Number: 733/150221

# ON THE CHARGE AT APSLEY. MULTIPLE DRILL TARGETS FOR PORPHYRY COPPER-GOLD DEPOSITS

IDENTIFIED IN IP DATA, LACHLAN FOLD BELT, NSW.

- Drill targets of significant size and depth extent have been defined by chargeability and resistivity anomalies in new ground Induced Polarisation (IP) data at Apsley.
- The IP anomalies occur within the core zone of a large 2,000 m long by 500 m wide soil geochemistry anomaly defined by copper-gold-platinum-palladium, a metal assemblage characteristic of alkalic porphyry deposits such as Cadia-Ridgeway.
- The core is surrounded by a halo of zinc-lead-manganese covering several square kilometres and together these define a text book example of a "zinc doughnut", a pattern well recognised and understood in porphyry copper-gold exploration and present around major deposits globally.
- A set of priority targets have been identified in the IP and soil geochemistry data which have been fast tracked for drilling.
- A drill rig has been secured and will commence drill testing as soon as practicable after the receipt of statutory approvals, expected by early March.
- Detailed mapping and sampling along the IP traverses as well as drill pad preparation is in progress.

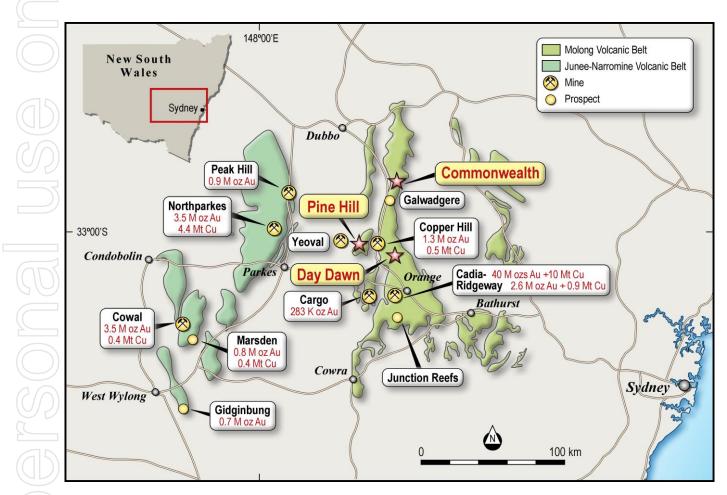
Impact Minerals Limited Managing Director Dr Mike Jones said "These exceptional IP results, in particular the chargeability anomalies, are very exciting given they are coincident with our "text book" soil geochemistry patterns that are characteristic of those around major porphyry copper-gold deposits around the world".

"The anomalies start close to surface, extend to considerable depth and appear to link up along trend, thus supporting our contention that the whole area is potentially part of one large mineralised system" he said.

"These are now the most prospective targets in our entire portfolio and they warrant immediate drill testing. We are charging forward as fast as possible and have already secured a drill rig, lodged the paperwork for the required statutory approvals and have people on the ground doing further field checking of the drill sites. We aim to drill these compelling targets as soon as we can and we are certainly very hopeful that we could be about to find the "jam" in the middle of our zinc doughnut. Dr Jones said.



New Induced Polarisation geophysical data from Impact Minerals Limited's (ASX:IPT) Apsley Prospect within its 100% owned Commonwealth project in the Lachlan copper-gold province of New South Wales (Figure 1) has helped define numerous drill targets with the potential for the discovery of a major porphyry copper-gold deposit.



**Figure 1.** Location of Impact's Commonwealth, Pine Hill and Day Dawn Projects covering about 900 sq km of the Lachlan Fold Belt of NSW, home to many significant gold and copper mines.

The IP survey was completed over a large and significant soil geochemistry anomaly which comprises a core zone 2,000 metres long and 500 metres wide with coincident copper-gold-platinum and palladium anomalies which is surrounded by a larger zone or halo of zinc-lead and manganese. Together these zones define a soil anomaly that covers nearly four square kilometres (ASX Release 10<sup>th</sup> August 2020).

A total of 11 IP traverses were completed over the entire soil geochemistry anomaly with a further three traverses completed to the north which are still being interpreted.



#### **Induced Polarisation Results**

Significant IP chargeability and resistivity anomalies have been defined on all 11 survey traverses with five priority traverses showing an excellent correlation with the soil geochemistry. The chargeability, resistivity and soil geochemistry results for two stand-out traverses from the priority five are shown in Figure 2 together with the proposed location of drill holes to test the various anomalies.

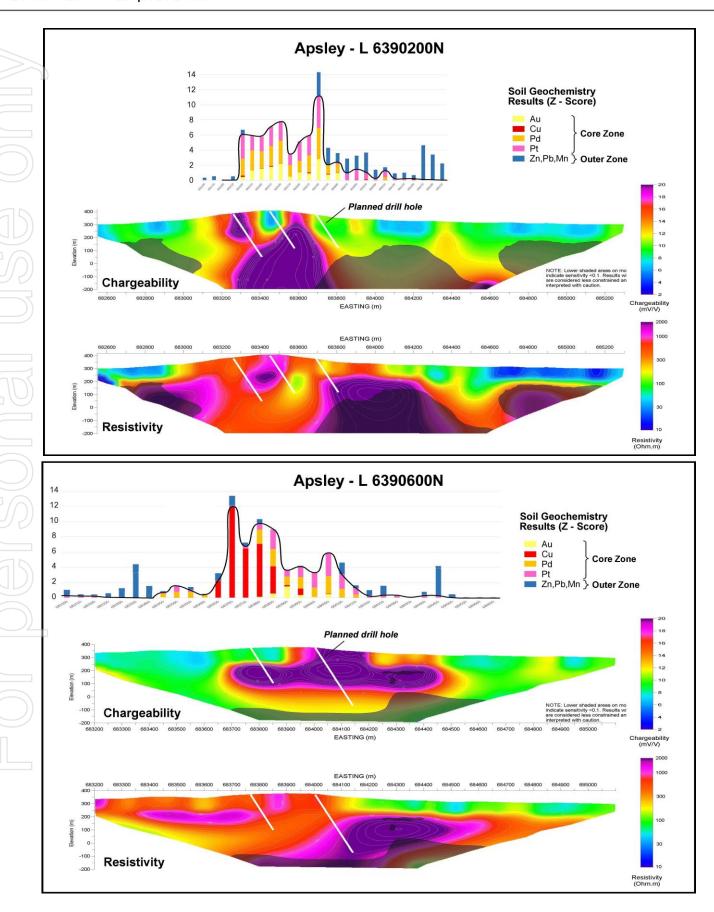
On Traverse 6,390,200 mN two very strong chargeability anomalies, separated by a resistivity anomaly, extend from surface to a depth of at least 300 metres. The anomalies lie directly below strong geochemical responses dominated by gold, platinum and palladium and together these define a target zone up to 600 metres wide (Figure 2).

On Traverse 6,390,600 mN a very strong chargeability anomaly extends from surface to a depth of about 200 metres, where it is possibly truncated by a low-angle structure which separates it from a deeper resistivity anomaly. The anomalies lie directly below strong geochemical responses dominated by copper, platinum and palladium and together these also define a target zone that is up to 600 metres wide (Figure 2).

Similar relationships are also self-evident on the other three priority traverses (Figure 3). In addition, similar correlations but with weaker IP and soil geochemistry responses are present on most of the other traverses.

The chargeability anomalies in particular can be tracked across numerous traverses thus implying continuity to the anomalies over hundreds of metres of trend in places. Figure 4 shows an interpretation of the extent of the chargeability anomalies on an image of the airborne magnetic data over the Apsley target. The correlation with the copper-gold-platinum-palladium core of the soil geochemistry anomaly and mapped porphyry intrusions is very evident (ASX Release 10<sup>th</sup> August 2020).





**Figure 2.** IP and Soil Geochemistry results shown as stacked bar charts of the Z scores for Traverses 6,390,200mN and 6,390,600mN. All results are at the same scale.

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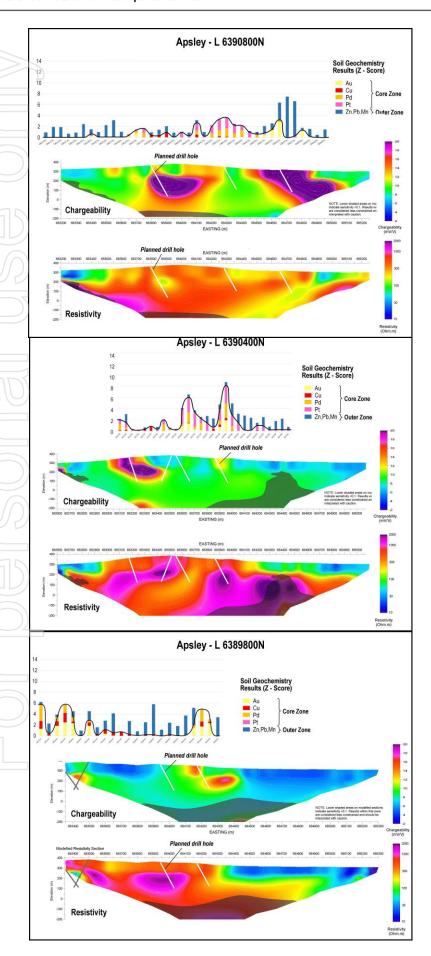
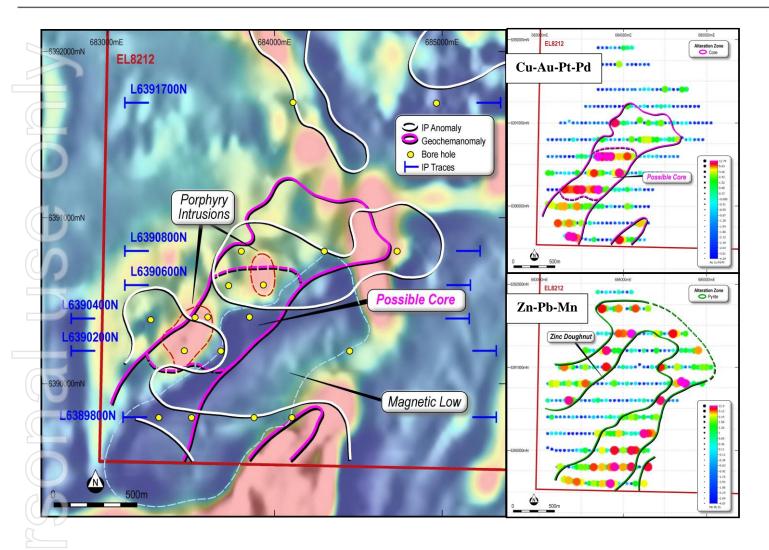


Figure 3. IP and Soil Geochemistry results for Traverses 6,390,800mN, 6,390,400mN and 6,389,800mN





**Figure 4.** Image of airborne magnetic data over the Apsley prospect with more magnetic units shown in warmer colours showing the interpreted outlines of the chargeability anomalies and the core of the soil geochemistry anomaly. Note also the coincidence with the isolated magnetic anomalies that are targets for the parent porphyry intrusions to any copper-gold mineralisation.

For reference the results of the soil geochemistry survey (shown as additive Z-scores) are also shown. The core zone of copper-gold-platinum-palladium (top right) is surrounded by an outer zone of zinc-lead-manganese thus defining a classic zinc doughnut. In addition, the outer zone is also in part coincident with a significant magnetic low which may reflect replacement of magnetite in the host rocks by pyrite as may be expected in outer alteration zones of porphyry systems (for further discussion of these results and the zonation around porphyry copper-gold deposits see ASX Release 10th August 2020 and the end of this report).

Apsley is a text book area for the discovery of a major porphyry copper-gold deposit.



#### **Discussion**

Work by Impact has shown that the Apsley area contains many characteristic features associated with giant alkaline copper-gold deposits of which Cadia-Ridgeway and North Parkes are the type examples in the Lachlan Fold Belt. These include:

- 1. Widespread copper-bearing shoshonite host rocks of Ordovician age (a specific high potassium alkaline volcanic and intrusive rock).
- 2. Rock chip samples and soil geochemistry anomalies with metal assemblages and alteration minerals characteristic of the inner to outer zones of large porphyry copper-gold deposits.
- 3. The presence of platinum and palladium together with the copper and gold anomalism in the core of the soil anomaly. Platinum group metals are commonly considered diagnostic metals in alkalic porphyry copper-gold deposits.
- 4. A so-called "zinc doughnut" evident in the soil geochemistry data, a characteristic pattern that is well understood and seen around many significant porphyry copper-gold deposits globally. An example around the Wafi-Golpu deposit in PNG which is of a similar size to that at Apsley is described at the end of this report.
- 5. An association with magnetic anomalies that may represent the parent intrusion to the system or "skarn' alteration directly associated with copper-gold mineralisation as is seen at the recent Boda discovery of Alkane Resources Limited (ASX:ALK and IPT ASX Releases 22<sup>nd</sup> November 2019, 14<sup>th</sup> January 2020, 23<sup>rd</sup> April 2020, 23<sup>rd</sup> June 2020, 10<sup>th</sup> August 2020).

For reference a schematic model and detailed description of the metal assemblages and alteration zones around a porphyry copper deposit is given at the end of this report. The model is widely used in exploration for this style of deposit.

The new IP data and its spatial coincidence with the soil geochemistry and magnetic data adds immensely to the prospectivity of the Apsley area and further supports Impact's contention that the entire area may be part of one very large mineralised system (ASX Release 10<sup>th</sup> August 2020).

Apsley is a compelling area for the discovery of a major porphyry copper-gold deposit.

#### **NEXT STEPS**

Impact considers the targets at Apsley to be the most prospective in its entire project portfolio and accordingly has prioritised and fast tracked them for drilling.

Field checking and rock chip sampling along the priority IP traverses and inspections of specific drill sites for ground clearance is in progress.

A drill programme comprising up to 3,000 metres of RC drilling will commence as soon as practicable after the receipt of statutory approvals which are expected within a few weeks.



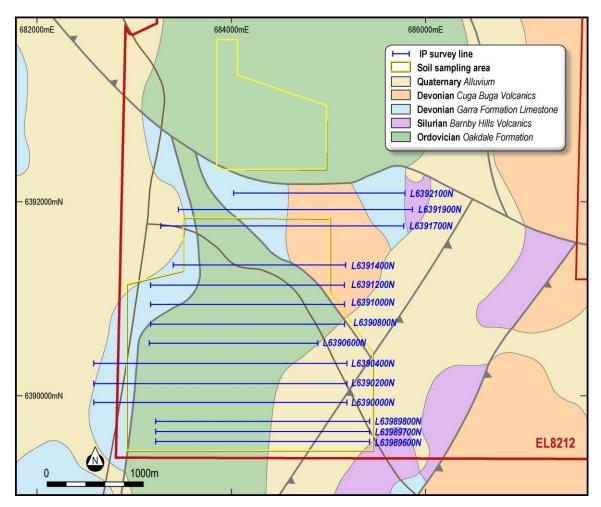
#### **About the Induced Polarisation Ground Geophysical Survey**

The Induced Polarisation technique is a widely used electrical geophysical technique in exploration for porphyry copper-gold (and epithermal gold) deposits that are characterised by disseminated sulphide. This is because the IP technique can identify zones of disseminated sulphide as areas of strong electrical conductivity known as "chargeability anomalies".

In addition, the technique can identify areas that strongly resist electrical current flow called "resistivity anomalies" and which may for example, represent areas of strong silica alteration or intense development of quartz veins.

A total of 14 traverses each about 2,500 metres long and between 100 m and 300 metres apart were completed, mostly over the core area of the major soil geochemistry anomaly (Figure 5).

The survey was extended several times because of ongoing encouraging results.



**Figure 5.** Geology of the Apsley Prospect showing the location of the IP traverses and the outline of the soil geochemistry survey reported previously (ASX Release 10<sup>th</sup> August 2020).



### The Role of Zonation in Exploration for Porphyry Copper-Gold Deposits

A key driver in the exploration for porphyry copper-gold deposits is to develop an understanding of the nature and distribution of the distinct zones of commodity metals, pathfinder metals and associated alteration minerals that form around such deposits in order to provide vectors to the high-grade cores.

These zones, shown in Figure 6, are well understood in the scientific literature and are widely used in exploration models for porphyry deposits in the Lachlan Fold Belt and elsewhere. Impact has modified the diagram to show the location of the main ore zones and the outer pyrite shell both of which are commonly detectable by electrical geophysical techniques such as Induced Polarisation.

From top to bottom the zones and associated metal assemblages are as follows:

- 1. Advanced argillic zone: thallium (Tl), lithium (Li), antimony (Sb) and arsenic (As).
- 2. Upper phyllic zone: bismuth (Bi), tellurium (Te) and selenium (Se).
- 3. Lower phyllic zone: tin (Sn), tungsten (W) and molybdenum (Mo).

The phyllic zone is also characterised by extensive pyrite. The pyrite will generally replace pre-existing magnetite in the parent rocks and accordingly the alteration systems around many porphyry copper-gold deposits are associated with marked lows in magnetic survey data.

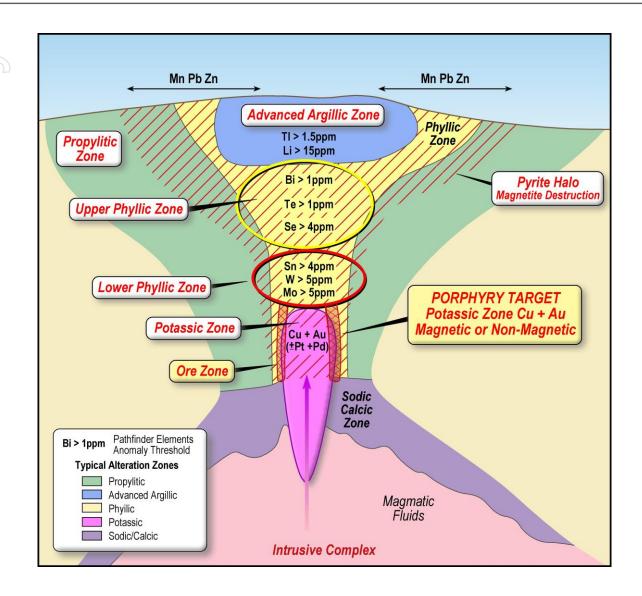
4. Potassic zone: This zone contains the copper (Cu) and gold (Au) ore. It is commonly centred on the parent porphyry intrusion which may contain magnetite and be recognisable as a discrete high in magnetic data.

In addition, it is well documented that the inner zones of alkalic porphyries world-wide commonly contain platinum group metals (PGM), palladium in particular. This is particularly the case at North Parkes. PGM's have not been widely used as an exploration tool in porphyry copper-gold exploration in the Lachlan Fold Belt.

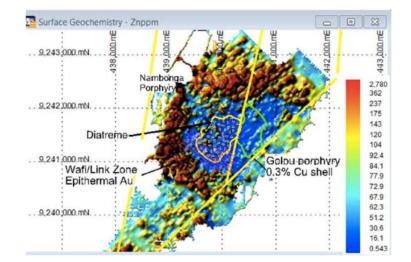
5. The entire porphyry copper-gold system is surrounded by an outer propylitic zone which is characterised by a wide range of metals as well as pyrite. The propylitic and phyllic zones are commonly associated with a metal assemblage of zinc-lead-manganese. In many major porphyry copper-gold deposits this produces a characteristic "zinc doughnut" where zinc and related metals are not present over the core of the porphyry but form a distinctive ring or annulus of base metals around the core of the porphyry. An example from Wafi-Golpu (>30 million ounces of gold and 10 Mt of copper) is also shown in Figure 7.

All of these features were potentially recognised in Impact's soil geochemistry survey and airborne magnetic data (ASX Release 10<sup>th</sup> August 2020). The new IP data has shown that the core area may also contain significant disseminated sulphide, further supporting the model.





**Figure 6.** Model of the alteration zones and metal assemblages expected around major copper-gold deposits. In plan view these zones would be concentrically arranged around the host porphyry and this gives rise to the zinc doughnut phenomenon as shown for Wafi-Golpu shown below. Here soil geochemistry data for zinc shows a well-developed annulus around the centre of the porphyry copper-gold deposit. Note the scale of the system which is similar to that defined at Apsley.





#### **COMPLIANCE STATEMENT**

This report contains new Exploration Results for a major Induced Polarisation ground geophysical survey commissioned by Impact Minerals Limited.

Dr Michael G Jones Managing Director

#### COMPETENT PERSONS STATEMENT

The review of exploration activities and results contained in this report is based on information compiled by Dr Mike Jones, a Member of the Australian Institute of Geoscientists. He is a director of the company and works for Impact Minerals Limited. He has sufficient experience which is relevant to the style of mineralisation and types of deposits 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 (the JORC Code). Mike Jones has consented to the inclusion in the report of the matters based on his information in the form and context in which it appears.



#### **APPENDIX 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 down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.	IP Survey An industry standard ground dipole-dipole survey was completed by Fender Geophysics. A receiver dipole length of 100 m and transmitter pole spacing of 100 metres was used.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used	Standard industry daily calibration completed by Fender Geophysics.
	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	Numerous chargeability and resistivity anomalies were identified.
Drilling techniques	Drill type (e.g. 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).	N/A
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed	N/A
	Measures taken to maximise sample recovery and ensure representative nature of the samples	N/A
	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.	N/A
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.	N/A
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.	N/A
	The total length and percentage of the relevant intersections logged	N/A



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Criteria	JORC Code explanation	Commentary
Sub-sampling techniques and sample preparation  If core, whether cut or sawn and whether quarter, half or all core taken.		N/A
	If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.	N/A.
•	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	N/A
•	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	A minimum of three separate readings, each a 15 fold stack were completed at each station to verify repeatability.
	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.	Not appropriate for this stage of exploration.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	The size of samples is appropriate for this stage of exploration.
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.	N/A
	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.	Instrumentation GDD Rx32 16-channel IP Receiver  Voltage Measurement: Resolution $1\mu$ V, Accuracy $\leq$ 0,15%  Chargeability measurement: Resolution $1\mu$ V/V, Accuracy $\leq$ 0.4%  Adjustment: Automatic synch, SP compensation, gain setting and stacking  ADCs: 24-bit  Primary Voltage: $\pm$ 10 $\mu$ to $\pm$ 15V for any channel  Operating Temperature: 40° C to +60° C  Full waveform acquisition: -Yes $-$ QC with GDD Full Waveform post-processing software
	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.	As above
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel.	The anomalies generated have not been verified by independent or alternative companies. This is not required at this stage of exploration.
	The use of twinned holes.	N/A
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	Standard procedures apply to ground geophysical surveys.
•	Discuss any adjustment to assay data.	No significant adjustments have been required.



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Criteria	JORC Code explanation	Commentary
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.	Samples were located with a handheld GPS.
	Specification of the grid system used.	The grid system for Commonwealth is MGA_GDA94, Zone 55.
	Quality and adequacy of topographic control.	N/A
Data spacing and distribution	Data spacing for reporting of Exploration Results.	Station spacing is appropriate for the scale of target being considered.
a	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.	N/A
	Whether sample compositing has been applied.	N/A
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.	The traverse lines have been completed at a high angle to the trend of stratigraphic units as interpreted from airborne magnetic data.
	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.	N/A
Sample security	The measures taken to ensure sample security.	N/A
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	This is not material for these Exploration Results.



#### **SECTION 2 REPORTING OF EXPLORATION RESULTS**

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	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 Commonwealth Project currently comprises 5 exploration licences covering 800 km². The tenements are held 100% by Endeavour Minerals Pty Ltd, a subsidiary company of Impact Minerals Limited. No aboriginal sites or places have been declared or recorded in areas where Impact is currently exploring. There are no national parks over the license area.
	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 tenements are in good standing with no known impediments.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	No significant exploration has been recorded by previous explorers. Some rock chip samples have been taken but no drilling.
Geology	Deposit type, geological setting and style of mineralisation.	Exploration is focussed on the discovery of porphyry copper-gold mineralisation and other intrusive-related gold deposit styles.
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:  • easting and northing of the drill hole collar  • elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar  • dip and azimuth of the hole  • down hole length and interception depth  • hole length.	N/A
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.	N/A
	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.	N/A
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	N/A
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results.  If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.  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').	N/A



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	Criteria	JORC Code explanation	Commentary
	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.	Refer to Figures in body of text.
	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.	IP anomalies of varying strengths and extent were recorded on every traverse. As noted in the text only the strongest anomalies are discussed and presented. Further work will be focussed on these areas.
	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.	Assessment of other substantive exploration data is not yet complete however considered immaterial at this stage.
	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).  Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive	Follow up work programmes will be subject to interpretation of recent and historic results which is ongoing.