



ASX Release

2 September 2019

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**Directors / Officers:**

Rob Scott  
Simon Paull  
Peter Smith  
Gerrard Hall

**Chief Financial Officer:**

Alan Armstrong

**Issued Capital:**

641.6 million shares  
104.5 million options  
26.8 million convertible  
notes

**ASX Symbol:**

CCZ

## Encouraging stockpile assays reinforce upside from developing Cangai Copper Mine

- CCZ has received encouraging assay results for legacy stockpiles at Smelter Creek and along the line of lode at Cangai Copper Mine (CCM), with head grades averaging 2.03% and 1.23% Cu<sup>1</sup> respectively:
  - ❖ Leveraging earlier metallurgical test-work results, which demonstrated copper concentrate recoveries >80% and grades up to 22%<sup>2</sup>, there are compelling arguments to process the stockpiles to generate early stage cashflow
- These results have been shared with Singapore-based, Noble Group, which CCZ is aiming to finalise a binding off-take agreement for the distribution of up to 200,000t of copper concentrate<sup>3</sup>
- In the event of securing regulatory approval, the ability to process then monetise CCM's stockpiles should be relatively straight forward since:
  - ❖ The mine site is readily accessible and, critically, there are experienced labour pools in northern NSW;
  - ❖ There are third-party facilities in the region that potentially are amenable to process the stockpile ore into copper concentrate for export; and
  - ❖ Top-tier infrastructure, with sealed roads and rail network that lead directly to Newcastle port
- As a core pillar to CCZ's strategy, the Board remains totally committed to developing and expanding the resource size at CCM, given it is one of the highest grading deposits in Australia and delivers significant exploration upside
- Currently, the geology team are assessing forward exploration plans and the merits of an economic scoping study – shareholders will be apprised of developments in due course

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**Castillo Copper's Managing Director Simon Paull commented:**

"Reconciling the assay results for the legacy stockpiles with earlier metallurgical test-work findings, clearly demonstrates the value creating potential from closing the distribution agreement with Noble Group. More importantly, the potential ability to monetise the stockpile ore would generate early stage cashflow. Reflecting the Board's core commitment to Cangai Copper Mine, especially as one of the three key strategic pillars critical to transforming CCZ into a mid-tier copper group, the geology team are closely reviewing the best course of action to optimise the next phase of exploration."

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**Castillo Copper Limited (“CCZ” or “the Company”)** is delighted to provide shareholders with an update on encouraging assay results for the legacy stockpiles along the line of lode at CCM and Smelter Creek.

## **STRATEGIC INTENT TO MONETISE LEGACY STOCKPILES**

The assay results for samples collected from legacy stockpiles at Smelter Creek (Figure 1) and along the line of lode had average head grades at 2.03% and 1.23% Cu<sup>1</sup> respectively. These are highly encouraging figures as when reconciled against metallurgical test-work, which showed >80% copper concentrate recoveries at 22%<sup>2</sup>, demonstrates the clear merits of progressing with plans to process the stockpile ore.

Notably, these results have already been shared with Noble Group in Singapore, which CCZ is targeting to close a binding off-take agreement to distribute up to 200,000t of copper concentrate<sup>3</sup>.

**FIGURE 1: SMELTER CREEK STOCKPILE**



Location: 450000mE, 6735800mN  
Source: CCZ geology team

Subject to the NSW Resources Regulator’s (NSWRR) approval, the logistics involved in monetising the stockpile ore should be relatively straight forward, as the utility and transport infrastructure to Newcastle port is first rate. Further, there are potentially several third-party operators in the region amenable to processing the stockpile ore into a marketable concentrate for key Asian export markets. The value creating opportunity is clearly the opportunity to generate early stage cashflow that can be utilised to further develop CCM’s potential and ultimately prove up a JORC compliant resource.

## Next steps

There are several issues which require further follow up which include:

- 1) Liaising with Noble Group and deciding degree of incremental metallurgical work to be conducted to finalise the off-take agreement;
- 2) Re-open discussions with NSWRR on the necessary approvals required to process the stockpile ore; and,
- 3) Evaluate forward exploration plans and merits of undertaking an economic scoping study.

For and on behalf of Castillo Copper

**Simon Paul**

**Managing Director**

## ABOUT CASTILLO COPPER

Castillo Copper Limited (ASX: CCZ) is an ASX-listed base metal explorer primarily focused on copper then nickel, zinc & cobalt.

The group is embarking on a strategic transformation to morph into a mid-tier copper group underpinned by three core pillars:

- **Pillar I:** Cangai Copper Mine in northern New South Wales, which is one of Australia's highest grading historic copper mines with a JORC inferred resource of 3.2Mt @ 3.35% Cu (ASX Announcement - 6 September 2017);
- **Pillar II:** The Mt Oxide project in the Mt Isa district, north-west Queensland, which delivers significant exploration upside through having a sizeable untested anomaly within its boundaries in a copper-rich region.
- **Pillar III:** Several high-quality prospective assets in Zambia, which is the second largest copper producer in Africa.

In addition, Castillo Copper is progressing a dual listing on the standard board of the London Stock Exchange.

## References

- 1) Assays undertaken by Peacocke & Simpson, Zimbabwe <<https://peacockesimpson.com/>>
- 2) CCZ ASX Release dated 6 May 2019
- 3) CCZ ASX Release dated 20 November 2018
- 4) CCZ ASX Release dated 8 August 18

## Competent Person Statement

*The information on the page that relates to Exploration Results of the Smelter Creek stockpiles is based on information compiled or reviewed by Mr Mark Biggs, a consultant of Castillo Copper Limited. Mr Biggs is a member of the Australian Institute of Geoscientists and has sufficient experience of relevance to the styles of mineralisation and types of deposits under consideration, and to the activities undertaken, to qualify as a Competent Person as defined in the 2012 Edition of the Joint Ore Reserves Committee (JORC) Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Biggs consents to the inclusion in this report of the matters based on information in the form and context in which it appears.*

*The information in this report that relates to Mineral Resources of the Cangai Copper Mine is based on information compiled by Peter Smith, a Competent Person who is a Member of the Australian Institute of Geoscientists. Peter Smith is employed by Castillo Copper Pty Ltd. Peter Smith has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken 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'. Peter Smith consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.*

The Australian Securities Exchange has not reviewed and does not accept responsibility for the accuracy or adequacy of this release.



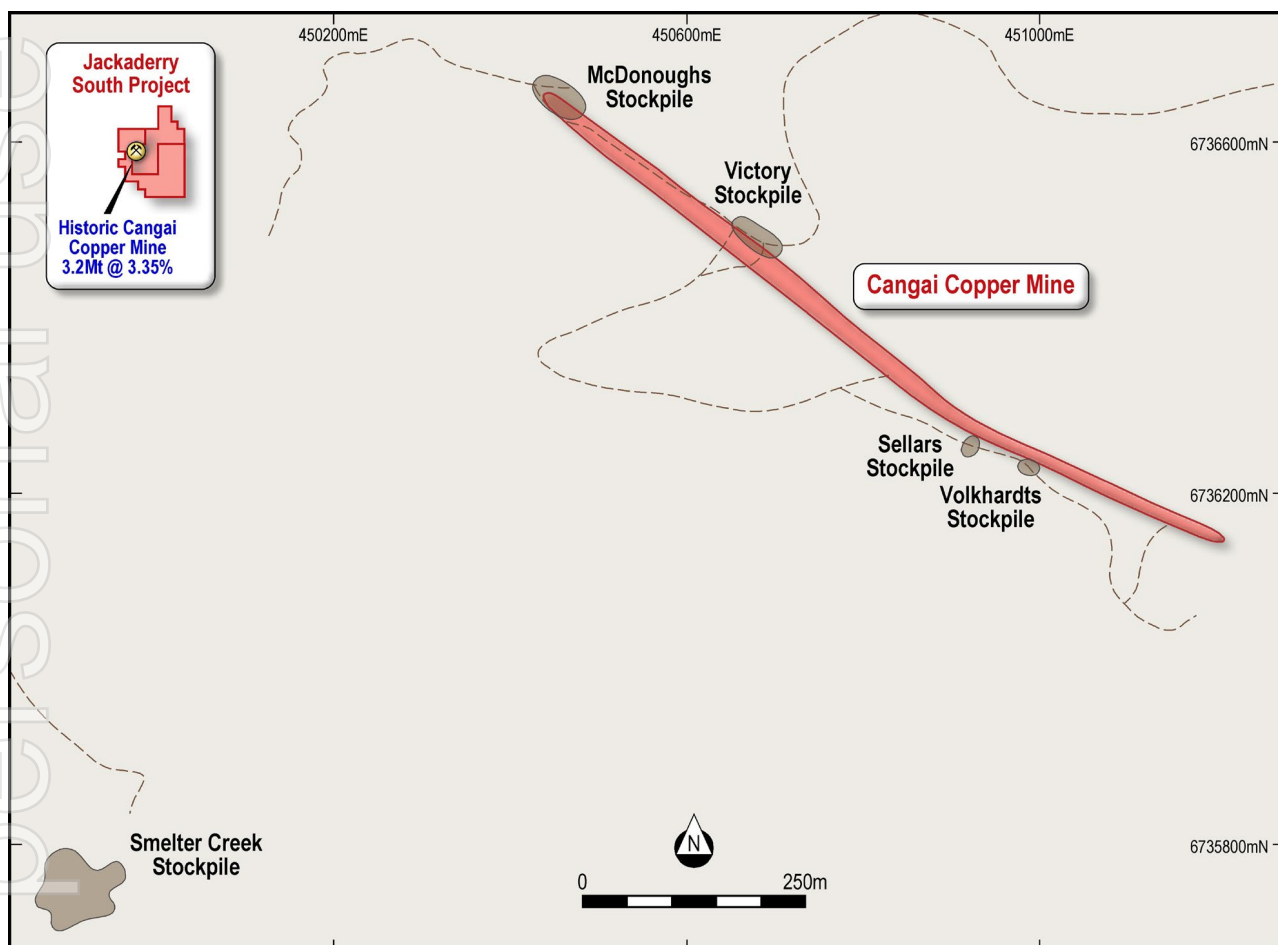
## Appendix 1: Additional metallurgical testing

### Background

Bulk samples at two sites (refer to ASX release above) have provided information that complements prior metallurgical test-work and preliminary concentrate testing undertaken at ALS' Perth Laboratory<sup>4</sup>.

This work intended to obtain more representative samples of possible head grades that would present after mining and transport to preferred beneficiation methodologies. The general location of the legacy stockpiles is given in Figure A1-1. The location of each sample is shown below in Figures A1-3, A1-4 and A1-5 and further sample details provided in Table A1-1.

**FIGURE A1-1: LEGACY STOCKPILES AT CANGAI COPPER MINE**



Source: CCZ geology team

**Table A1-1: MCDONOUGH'S PORTAL and SMELTER SAMPLE LOCATIONS**

Composite	Site ID	Easting	Northing	Elevation	From (m)	To (m)	Sample ID	Sample wt (kg)	Sample type	Lab Dispatch	Comments	Date Assay Finalised
1	SCS	450010	6735560	198	0	0.5	P&S_1	50	bulk	PS/657B/18T	McDonoughs Portal A Level Dump	08.04.2019
2	MCDP	450457	6736659	230	0	0.5	P&S_2	50	bulk	PS/657B/18T	Slag Dump Portal A Level Dump	08.04.2019

Source: CCZ geology team

The sampling used sledgehammers, geological picks and shovels to collect channel samples. Several smaller samples were combined to provide approximately 50kg for testing.

The following processing and analysis procedures (Figure A1-2) were undertaken by material processing engineers Peacocke and Simpson, based in Zimbabwe. Gold was analysed using a modified fire assay technique.

**Figure A1-2: Processing Methodology Cangai Bulk Samples**

<ul style="list-style-type: none"> <li>• Samples are logged into the lab and request form checked against physical sample ID</li> <li>• Anomalies are checked and recorded</li> </ul>	<ul style="list-style-type: none"> <li>• Samples are logged into the lab and request form checked against physical sample ID</li> <li>• Anomalies are checked and recorded</li> </ul>
<ul style="list-style-type: none"> <li>• Samples are dried at 105 °C where necessary</li> <li>• Samples are crushed to 80% passing through 2.36mm</li> <li>• Barren Rock used in between each sample</li> </ul>	<ul style="list-style-type: none"> <li>• Samples are dried at 105 °C where necessary</li> <li>• Samples are crushed to 80% passing through 2.36mm</li> <li>• Barren Rock used in between each sample</li> </ul>
<ul style="list-style-type: none"> <li>• Samples are pulverized using a single pot mill</li> <li>• Pulverized to 80% passing through 75µ</li> <li>• Barren rock and compressed air used in between samples</li> </ul>	<ul style="list-style-type: none"> <li>• Samples are pulverized using a single pot mill</li> <li>• Pulverized to 80% passing through 75µ</li> <li>• Barren rock and compressed air used in between samples</li> </ul>
<ul style="list-style-type: none"> <li>• Lead based flux mixed with sample</li> <li>• 10% replicates on each batch of 24</li> <li>• Reference material on each batch</li> <li>• BLANK sample on each batch</li> </ul>	<ul style="list-style-type: none"> <li>• Representative portion is sampled via Eriez rotating sample divider</li> <li>• 10% replicates on each batch of 20</li> <li>• Reference material on each batch</li> <li>• BLANK sample on each batch</li> </ul>
<ul style="list-style-type: none"> <li>• Samples fired in furnaces with verified temperatures (use of calibrated thermometer)</li> </ul>	
<ul style="list-style-type: none"> <li>• Samples cupelled in muffle furnace with verified temperatures (use of calibrated thermometer)</li> <li>• Copper pattern inputted at flux stage revealed at cupellation to ensure correct order of samples</li> </ul>	
<ul style="list-style-type: none"> <li>• Resultant prills are acid digested with verified chemicals</li> <li>• For gravimetric analysis prills are parted with nitric acid</li> </ul>	
<ul style="list-style-type: none"> <li>• AAS calibrated and verified with 2 different batches of standards</li> <li>• Gravimetric analysis using verified microbalance</li> </ul>	

**Figure A1-3 Location of Dump Samples**



Smelter Creek  
Location: 450000mE, 6735800mN

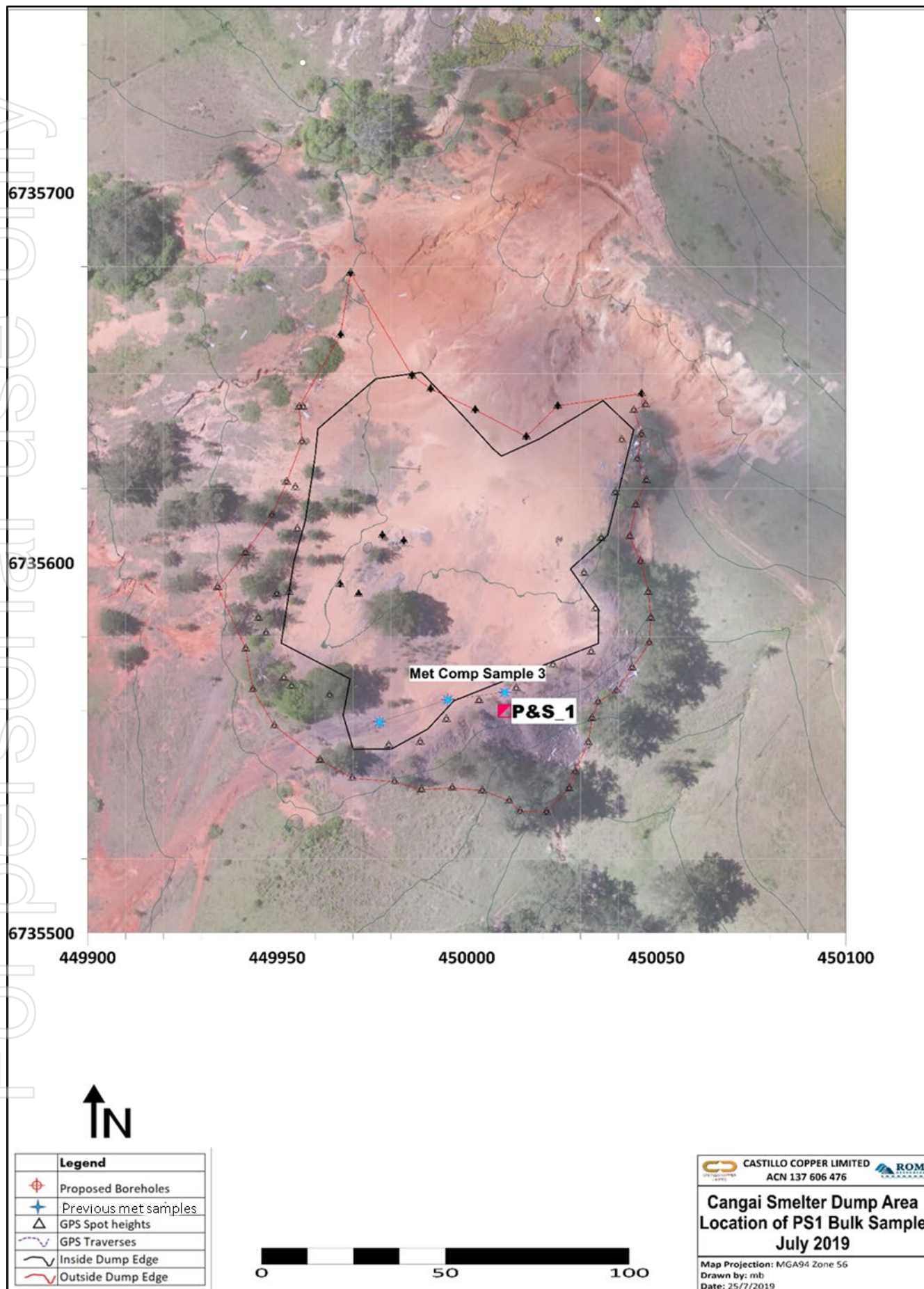


Along line of lode  
Location: 450500mE, 6736600mN

Source: CCZ Geology Team

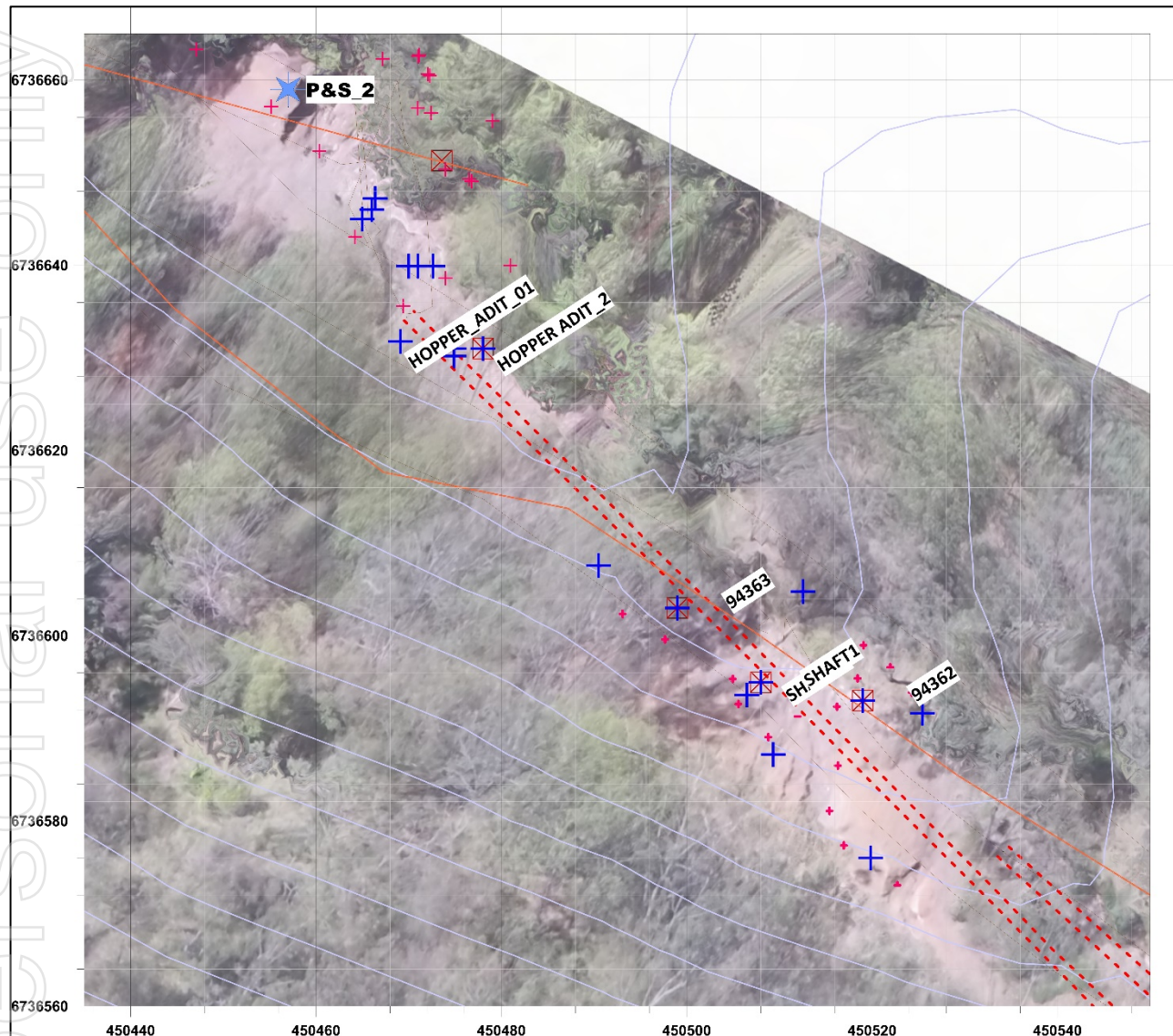


FIGURE A1-4: Smelter Creek Slag Dump Peacocke & Simpson Sample Site at CCM



Source: CCZ geology team

**FIGURE A1-5: McDonough's Portal Dump Peacocke & Simpson Sample Site at Cangai Copper Mine**



Source: CCZ geology team

### Composite 1: Smelter Ck Slag Dump Tailings Dump

Analysis outcomes from the above procedure are given in Table A1-2 below:

**Table A1-2: Average Results from Smelter Creek**

Element	Head 1	Head 2	Average
Gold (g/t Au)	0.15	0.14	0.15
Silver (g/t Ag)	9.74	6.92	8.33
Copper (% Cu)	2.00	2.06	2.03

Source: Peacocke and Simpson (2019)



## Composite 2: McDonough's Main Portal Dump

Analysis outcomes from the above procedure are given in Table A1-3 below:

**Table A1-3: Average Results from *Mcdonoughs Portal Stockpile***

Element	Head 1	Head 2	Average
Gold (g/t Au)	0.08	0.07	0.08
Silver (g/t Ag)	4.48	4.01	4.25
Copper (% Cu)	1.21	1.24	1.23

Source: Peacocke and Simpson (2019)

## Discussion

Testing by experienced mining process engineers confirmed substantial copper grades for both the waste rock dump and the smelter slag dump site. Of note is the fact that the smelter slag grades for each element are generally twice those of the mine dump material.

## APPENDIX 2: JORC CODE, 2012 EDITION – TABLE 1; METALLURGICAL 2019

### Section 1 Sampling Techniques and Data (Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
<b>Sampling techniques</b>	<ul style="list-style-type: none"> <li><i>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.</i></li> <li><i>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</i></li> <li><i>Aspects of the determination of mineralisation that are Material to the Public Report.</i></li> </ul> <p><i>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.</i></p>	<p>Samples from the Cangai bulk program were collected by hand. Initially 50-70kg of rocks and dust was collected and riffled down to a 50kg sample for further lab analysis.</p> <p>The pXRF Analysis on these bulk samples was carried out by using a handheld NITON XLt3 950 Portable XRF analyser. Measurements were taken on the surface of the sample rock specimens in several positions to estimate average grades for the sample. These results have been published in previous ASX releases (c.f. 2/8/2018).</p> <p>All samples are delivered to ALS Laboratory in Orange NSW where that lab undertakes the splitting and compositing of the 15kg samples and undertook to create a single 50kg composite, one for each site, for further testing.</p> <p>The final 50kg composites were freighted to Peacocke and Simpson in Harare Zimbabwe for a suite of metallurgical tests.</p> <p>The bulk sampling program completed to date is shown in tables throughout the body text and the Appendix 1 within this report.</p>
<b>Drilling techniques</b>	<ul style="list-style-type: none"> <li><i>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.).</i></li> </ul>	No drilling was conducted.

<b>Drill sample recovery</b>	<p>Method of recording and assessing core and chip sample recoveries and results assessed.</p> <p>Measures taken to maximise sample recovery and ensure representative nature of the samples. 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.</p>	No holes were drilled as part of this sampling program.
<b>Logging</b>	<p>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.</p> <p>Whether logging is qualitative or quantitative in nature.</p> <p>Core (or costean, channel, etc.) photography.</p> <ul style="list-style-type: none"> <li>•The total length and percentage of the relevant intersections logged</li> </ul>	No holes were drilled as part of this sampling program.
<b>Subsampling techniques and sample preparation</b>	<p>If core, whether cut or sawn and whether quarter, half or all core taken.</p> <p>If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry. For all sample types, the nature, quality and appropriateness of the sample preparation technique. Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.</p> <p>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. Whether sample sizes are appropriate to the grain size of the material being sampled.</p>	<p>Bulk samples were collected, and riffle split into calico bags at the rig. The samples were weighed and details recorded. A pXRF unit was utilized to test the samples for mineralisation to determine the general grade of the dumps. Composite samples were homogenized, and riffle split at the labs prior to assaying.</p> <p>Industry acceptable standards and blanks were used as certified reference material to ensure satisfactory performance of the laboratory. Results are awaiting completion and assay results will be compared will be compared with expected results</p>



<b>Quality of assay data and laboratory tests</b>	<p><i>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</i></p> <p><i>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.</i></p> <p><i>Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.</i></p>	<p>Multi-suite analysis methodology (MS-ME61) which involves a four-acid digestion, is being completed by ALS in Brisbane QLD, for the following elements ; Ag, As, Se, Ca, K, S, Ba, Sb, Sn, Cd, Pd, Zr, Sr, Rb, Pb, Hg, Zn, W, Cu, Ni, Co, V, Ti, Au, Ga, Ge, Li, La, Fe, Mn, Cr, Sc, Mo, Th, U, Ta.</p> <p>The work in Zimbabwe tested Au, Ag, Cu, and Co. Samples containing Au were tested for Au by fire assay method.</p>
<b>Verification of sampling and assaying</b>	<p><i>The verification of significant intersections by either independent or alternative company personnel.</i></p> <p><i>The use of twinned holes.</i></p> <p><i>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</i></p> <p><i>Discuss any adjustment to assay data.</i></p>	<p>Field reading of multi-elements were also estimated using a NITON XLt3 950 Portable XRF analyser as conducted as in internal check prior to sending samples for laboratory analysis.</p> <p>Reading times using 2 beam Geochem Mode was employed via 30sec/beam for a total of 60 sec.</p> <p>All relevant logging and sampling data is collected, and data entered into excel spread sheets. Data was sent to consulting geologists in Brisbane and CCZ'S Database Manager in Perth for compilation, correlation and database inclusion prior to being interpreted.</p>
<b>Location of data points</b>	<p><i>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.</i></p> <p><i>Specification of the grid system used.</i></p> <p><i>Quality and adequacy of topographic control.</i></p>	<p>Figure A1-4 and A1-5 show the field conditions for bulk sample sites at McDonough's portal and shaft dumps, respectively.</p> <p>Sample locations were taken by a Garmin hand-held GPS unit with positional accuracy in x and y previously shown to be in the order of <math>\pm 4m</math>.</p>

Figure A2-1 McDonoughs Portal Dump Site

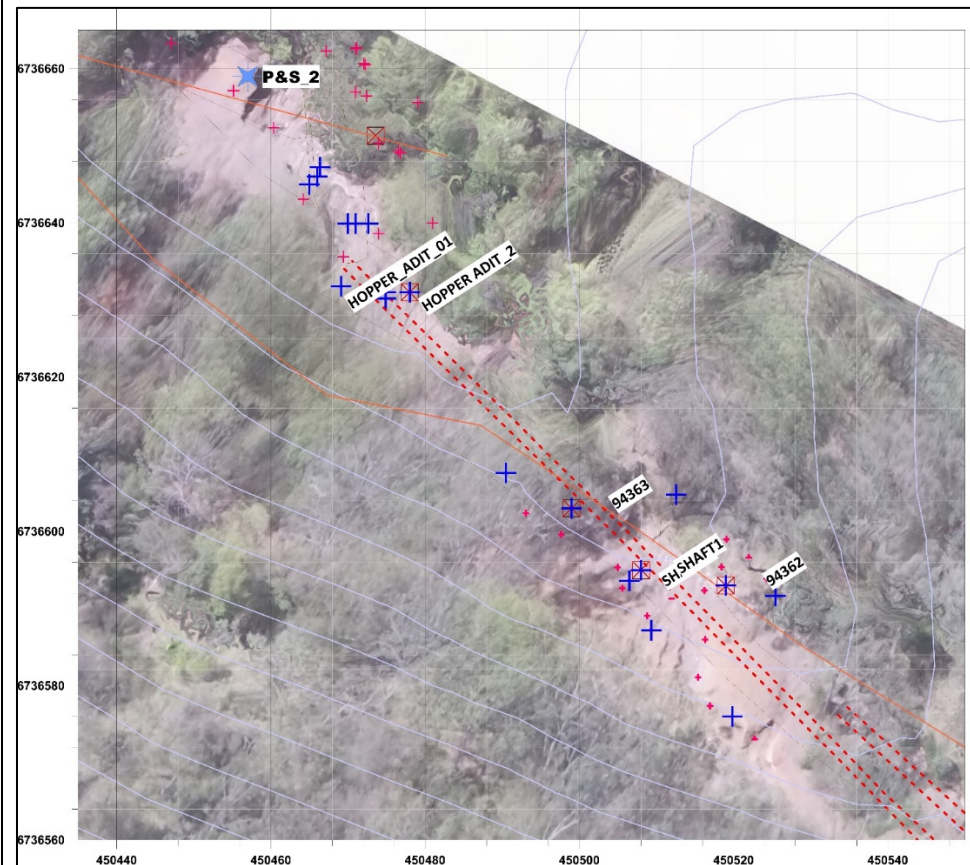
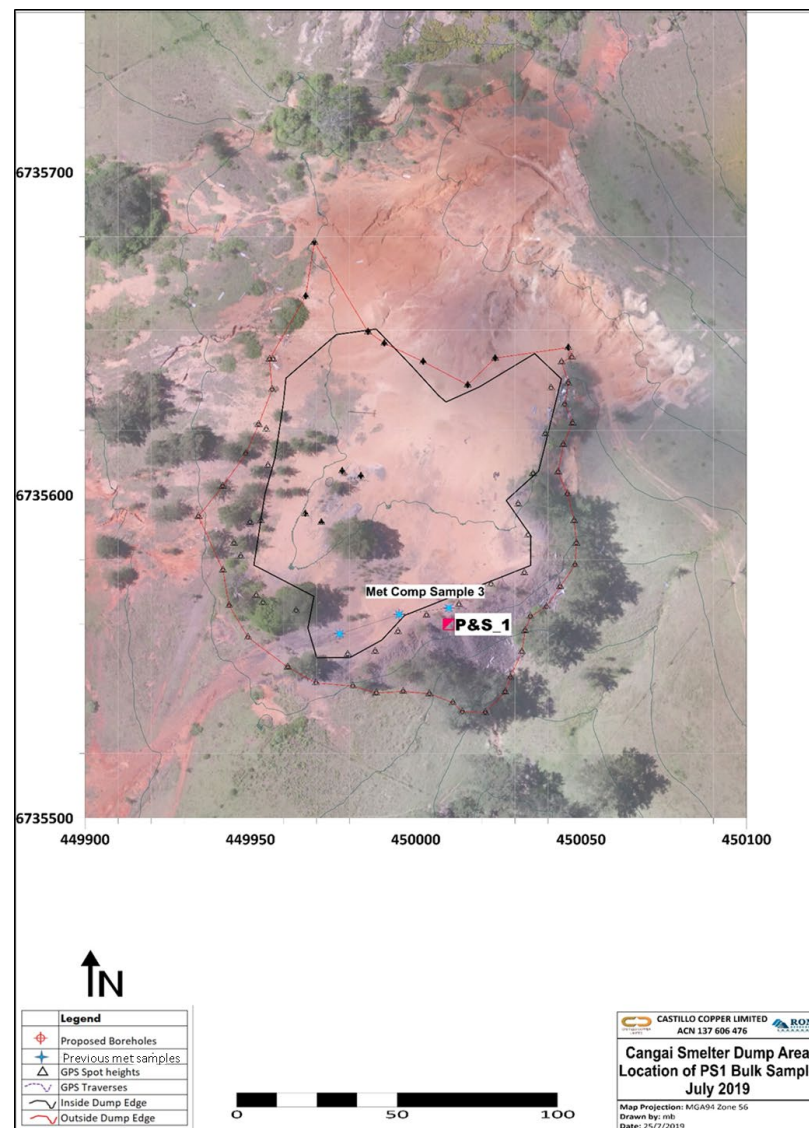


Figure A2-2 Smelter Creek Sag Dump Site





<b>Data spacing and distribution</b>	<ul style="list-style-type: none"> <li>• <i>Data spacing for reporting of Exploration Results.</i></li> <li>• <i>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.</i></li> <li>• <i>Whether sample compositing has been applied.</i></li> </ul>	The spacing of the sub-set bulk samples was approximately 10m apart. Enough samples were obtained at each site to create a 50kg composite sample.

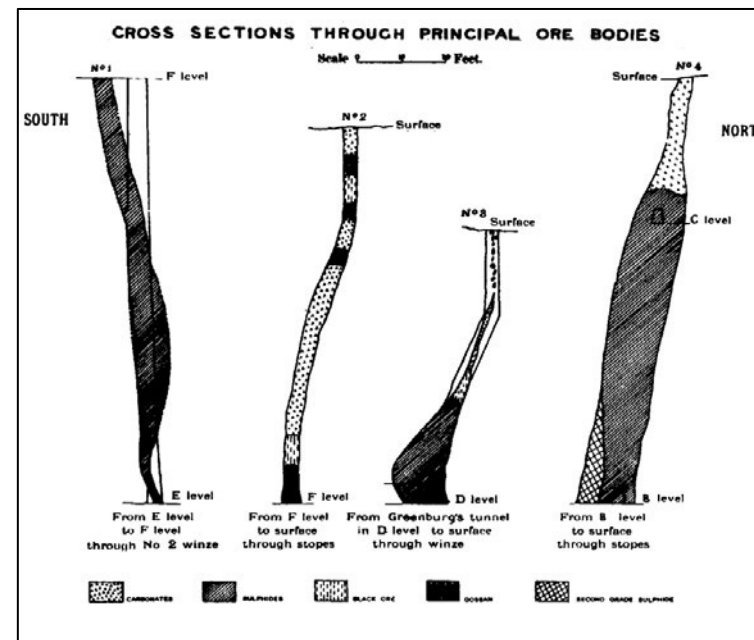
**Orientation of data in relation to geological structure**

- Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.
- 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.

Additional surface bedding and foliation data, and that from some of the accessible underground mine adits was compiled from a UNSW Honours thesis (Brauhart 1991). Information is available from underground workings, open cut(s), shaft(s), adit(s) and scrapings. The Lode sub-vertical to vertical, striking 126 degrees true north and pitching at 60 degrees to the west. The high-grade ore as mined, varies from 0.3m-3.9m wide

The known copper-gold mineralisation around Cangai strikes from 290-330 degrees, It should be noted that these orebody shapes were drawn at >13% Cu so that the width of the major orebody shapes shown by Figure A1-5, below:

Figure A1-5: Orientation of Copper-Gold Mineralisation at the Cangai Mine



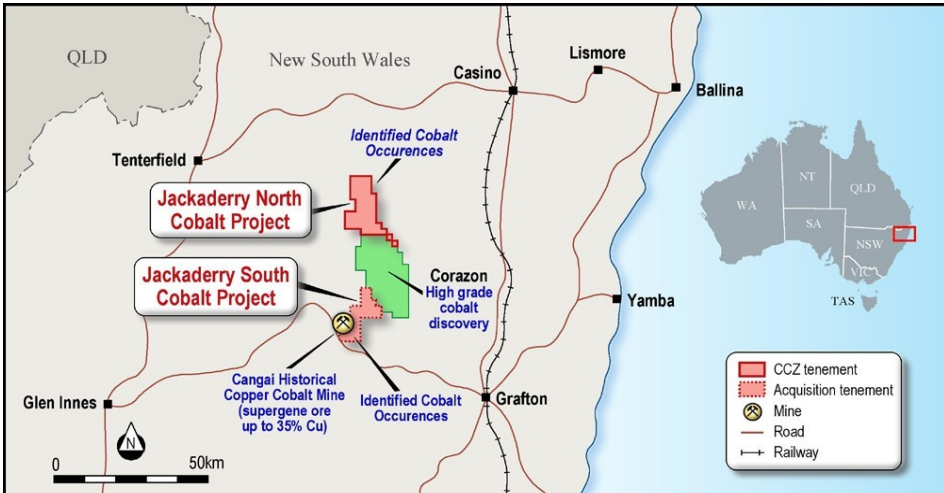
Modelled wireframes in the Maiden Resource estimate were cut at 1% Cu, but resource envelopes in future models will be enlarged to try to capture mineralisation down to 0.5% Cu.

<b>Sample security</b>	<ul style="list-style-type: none"> <li><i>The measures taken to ensure sample security.</i></li> </ul>	Samples were bagged were delivered by Gnomic Exploration Staff to ALS Orange who on-freighted them to ALS Laboratories Brisbane and thence to ALS Perth and overseas to Peacocke and Simpson in Harare Zimbabwe. Their methodology is outlined in Figure A1-2 in the section preceding this.
<b>Audits or reviews</b>	<ul style="list-style-type: none"> <li><i>The results of any audits or reviews of sampling techniques and data.</i></li> </ul>	No audits or reviews have yet been undertaken. This will commence once all assay results have been received.



## Section 2: Reporting of Exploration Results

Criteria listed in the preceding section also apply to this section

Criteria	JORC Code explanation	Commentary
<b>Mineral tenement and land tenure status</b>	<ul style="list-style-type: none"> <li>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.</li> <li>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.</li> </ul>	<p>Castillo Copper holds 100% of EL 8625 &amp; EL 8635. The tenure has been granted for a period of thirty-six months until 17<sup>th</sup> July 2020, for Group 1 minerals. The location of the tenures are shown in Figure A2-1 below:</p> <p>Figure A2-1: Location of EL 8625 and EL8635 Jackaderry South</p>  <p>The current drilling has all been completed on EL 8625 and EL 8635 Jackaderry South only.</p>

<p><b>Exploration done by other parties</b></p>	<p>• <i>Acknowledgment and appraisal of exploration by other parties.</i></p>	<p>Some mining history and discovery information provided by North Broken Hill Ltd (1970) is as follows:</p> <div data-bbox="1128 256 2083 542" style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p><b>Cangai</b>  The Cangai copper mine, located 10 km north west of Jackadgery, is one of the richest copper and gold mines in the region. This deposit was discovered in 1901 by J. Sellers and was subsequently mined by the Grafton Copper Mining Company Ltd from 1904 to 1917. A copper smelter was built and a substantial village with a sawmill developed. Recorded production is 5080 tonnes of copper, 52.7 kg of gold and 1035 kg of silver (Henley and Barnes 1992). The mine was unusual in that its discovery post-dated much of the initial mineral discoveries in New England. It had the distinction of paying its own way from ore produced from the mine and paid rich dividends to its shareholders as a result of the rich ore and the low production costs related to the self fluxing ore and that ore could be easily hauled downhill to the smelter. The mine prompted upgrades to roads and communications into the area.</p> </div> <p>Previous explorers (Brownlow, 1989; Abraham-Jones, 2012) have noted that a 'basement window' of exposed magmatic hydrothermal alteration and historical copper workings may represent the western and upper extent of a much larger hydrothermal system concealed under Mesozoic cover to the east, prospective for:</p> <ul style="list-style-type: none"> <li>• Quartz-tourmaline-sulphide-cemented, magmatic-hydrothermal breccia hosted copper-gold-molybdenum-cobalt (Cu-Au-Mo-Co) deposit;</li> <li>• Concealed porphyry copper-gold-molybdenum-cobalt (Cu-Au-Mo-Co) ore body associated with quartz diorite to tonalitic porphyry apophyses proximal to the tourmaline-sulphide cemented breccia's;</li> <li>• Potential also exists for copper-gold (Cu-Au) skarn;</li> </ul> <p>Considerable exploration has taken place in and around the Cangai Copper Mine (closed) by several large explorers such as Western Mining and CRA Exploration, the results of which are covered in the Local Geology section</p>
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<b>Geology</b>	<i>Deposit type, geological setting and style of mineralisation.</i>	<p style="text-align: center;"><b>Regional Geology</b></p> <p>The underlying geology is contained within the Coffs Harbour Block, east of the Demon Fault. The major basement unit is the Silurian-Devonian Silverwood Group (locally the Willowie Creek Beds), a mixed sequence of tuffaceous mudstones, intermediate to basic igneous rocks, slates, and phyllites, a low stage of regional metamorphism. Overlying this rock formation is a younger tectonic 20élange of Early Carboniferous age – the Gundahl Complex of slates, phyllites and schist, with chert, greenstone and massive lithic greywackes. These rocks are intruded by the Early Permian Kaloe Granodiorite (tonalite), which also in turn is intruded by numerous later-stage mafic (lamprophyre) dykes. Local Geology</p> <p>The local geology is well understood as considerable exploration has taken place in and around the Cangai Copper Mine (closed) by several major explorers such as Western Mining and CRA Exploration, the results of which are covered in the section below. The mineralisation is controlled by the presence of shear zones within the country rock and persistent jointing. Chloritic alteration is pervasive, with the major minerals identified (Henley and Barnes 1990) as:</p> <ul style="list-style-type: none"> <li>• <b>Azurite</b> major ore</li> <li>• <b>Chalcocite</b> major ore</li> <li>• <b>Chalcopyrite</b> major ore</li> <li>• <b>Copper</b> major ore</li> <li>• <b>Malachite</b> major ore</li> <li>• <b>Pyrite</b> major ore</li> <li>• <b>Pyrrhotite</b> major ore</li> <li>• <b>Arsenopyrite</b> minor ore</li> <li>• <b>Sphalerite</b> minor ore</li> <li>• <b>Cuprite</b> minor ore</li> <li>• <b>Gold</b> minor ore</li> <li>• <b>Limonite</b> minor ore</li> <li>• <b>Chlorite</b> major gangue</li> <li>• <b>Calcite</b> major gangue</li> <li>• <b>Quartz</b> major gangue</li> <li>• <b>Sericite</b> minor gangue</li> </ul>
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		<p><b>Western Mining 1982-1984</b></p> <p>Western Mining found that the recognition of substantial amounts of pyrrhotite in high grade ore collected from mine dumps led to the reappraisal of previous explorer's ground magnetics (Brown, 1984). Two soil anomalies were identified @ +60ppm Cu (max 1100ppm) and several strong linear magnetic anomalies (=250nT above background). Soil sampling and detailed ground inspections conducted over the linear magnetic high failed to identify any anomalous geochemistry or a possible source lithology. A 180m diamond drill hole was drilled to test the anomaly. Given the poor results of both the drilling and the follow-up stream sediment sampling, no further work was recommended. The decision was made to relinquish the licence in 1984.</p> <p><b>CRA Exploration 1991-1992</b></p> <p>CRA Exploration examined the geological form, setting and genesis of the mineralisation at the Cangai Copper Mine over several years. The work carried out consisted of geological mapping, collection of rock chip samples, and underground investigations at the mine site. Drill core from a CRA exploration program and mine dumps were also inspected. They concluded that the Cangai Copper Mine is hosted by sedimentary rocks of the Siluro-Devonian Willowie Creek Beds of tuffaceous mudstones, tuffaceous sandstones and conglomerates. Mineralisation appears to be associated with steeply plunging ore shoots in and adjacent to the main shear zone (Figure A2-2). Massive primary ore consists of chalcopyrite, pyrite and pyrrhotite with lesser sphalerite and minor arsenopyrite and galena. A detailed, well documented report was produced, but no reasons were given for the relinquishment of the licence.</p>
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Figure A2-2: Rock Chip Sampling at Cangai Copper Mine

Appendix 5 Ore Sample Assays

Similar dump samples to those collected by the author were submitted for analysis by CRA Exploration. Selected assays are presented below. Values are ppm unless otherwise stated.

	1	2	3	4	5	6
Cu	15.3%	28.6%	12.4%	14.8%	10.6%	11.0%
Pb	640	1200	1800	7550	800	2500
Zn	4.68%	1.27%	2.35%	9.50%	6400	5.10%
Ag	76	86	30	49	160	150
As	4750	1650	4850	3800	4750	7150
Mn	185	240	370	430	155	150
Au	1.80	2.50	0.72	2.30	1.32	1.85
Fe	30.9%	22.6%	28.2%	32.9%	33.8%	27.4%
S	27.5%	3.73%	16.6%	29.6%		
Co	70	25	300	330	370	300
V					<10	<10
Ba					<10	20
Ni					<5	<5
Bi					30	80
Cd					14	90

Sample description

- 1 Massive chalcopyrite-pyrite ore
- 2 Oxide material
- 3 Massive pyrite chalcopyrite rock with gangue clasts
- 4 Well banded pyrite-sphalerite ore
- 5 Weakly banded massive sulfide
- 6 Weakly banded massive sulfide

<b>Drill hole Information</b>	<p><i>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:</i></p> <ul style="list-style-type: none"> <li>• <i>easting and northing of the drill hole collar or elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar</i></li> <li>• <i>dip and azimuth of the hole</i></li> <li>• <i>down hole length and interception depth</i></li> <li>• <i>hole length.</i></li> </ul> <p><i>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</i></p>	<p>No drilling was undertaken as part of this sampling program.</p>
<b>Data aggregation methods</b>	<p><i>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. 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. The assumptions used for any reporting of metal equivalent values should be clearly stated.</i></p>	<p>No top cuts have been applied to reporting of the Significant Intersections and lower cut of 0.5% (5,000ppm) Cu has generally been used. Portions of each individual bulk sample (each approximately 15kg) were used in creating the composites. Full detailed assay intervals for the key elements are included in the Appendices of this report</p>

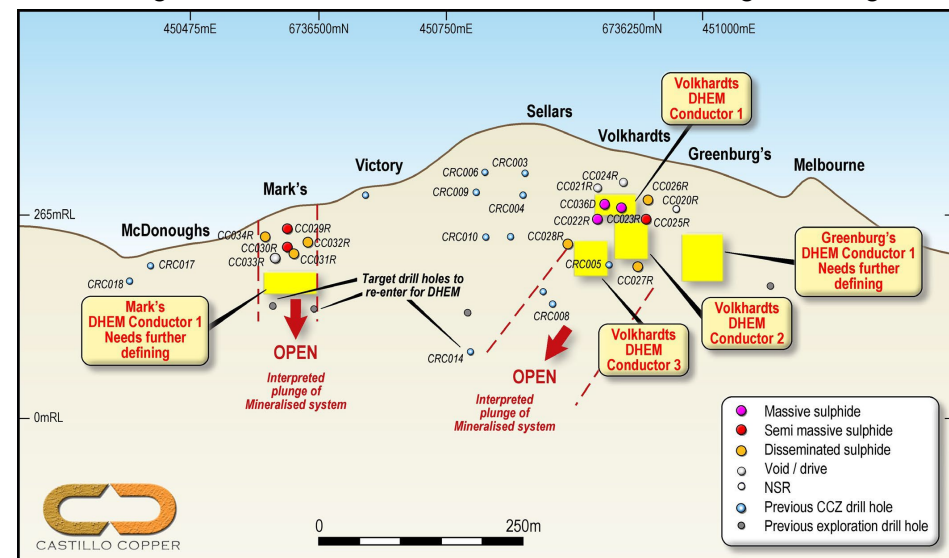
**Relationship between mineralisation widths and intercept lengths**

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').

All sampling was taken on or near the surface at reject dumps.

The Lode is currently modelled to be sub-vertical to vertical, striking 126 degrees and pitching at 60 degrees west. Varies from 0.3m-3.9m wide. The main mining was from Volkhardt's, Melbourne, Marks, Sellers & Greenburg's lenses. The secondary supergene zone grades averaged 20-35% Cu. The sulphide zone decreased to 8-10% Cu at depth. The Lode was largest at structural intersections. Breccia was recorded at D level. The host rock is massive fine-grained intermediate volcanic, and bedding is difficult to define. The deposit is structurally controlled with lodes following or adjacent to the shear zone. A temperature of formation is suggested to be about 380 degrees centigrade (Brauhart 1991). The NSW Geological Survey has characterized Cangai as a metahydrothermal structurally controlled deposit. Figure A2-4, below is a cross-section showing the four (4) main near vertical mineralised zones at the Cangai Mine.

Figure A2-4: NW to SE Cross-section of workings at Cangai Mine



Geo-registering was undertaken in August and September 2017, particularly the anomalous zones (which are in the process of being digitised off the 1908 and 1912 mine plans (Brauhart 1991), which become priority targets for geological mapping, ground magnetic and EM surveys. Further work to shift the mine plan was undertaken in June 2018. Data has also been extracted from a thorough UNSW Honours Thesis as referenced below:

Brauhart, C. (1991). *The Geology & Mineralisation of the Cangai Copper Mine, Coffs Harbour Block Northeastern New South Wales*. CRAE Report No: 17739. University of NSW.



<b>Diagrams</b>	<i>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.</i>	Appropriate diagrams have been included in the body text of the announcement.
<b>Balanced reporting</b>	<i>Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced avoiding misleading reporting of Exploration Results.</i>	All bulk samples completed to date have been reported.
<b>Other substantive exploration data</b>	<i>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.</i>	Other exploration activities at Cangai have been reported in recent ASX releases.
<b>Future Work</b>	<i>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.</i>	Tables A1-3 and 4 (in Appendix 1) lists the lab results already returned of some completed channel sampling (50kg bulk sample) at the McDonough's portal and shaft reject dump sites. Further metallurgical test work is being completed for the smelter slag dump, and will be reported when completed.