









#### Avanco Resources (ASX: AVB)

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# ASX ANNOUNCEMENT 26 May 2016

# RESOURCE UPGRADE ADVANCES PEDRA BRANCA DEVELOPMENT STRATEGY

The Company is pleased to announce that results from infill drilling have significantly increased confidence in the Pedra Branca<sup>1</sup> ("PB") East Mineral Resource.

## **HIGHLIGHTS**

➤ The PB East Mineral Resource<sup>2</sup> now stands at:

# 10.48mt at 2.8% copper and 0.7g/t gold

- ➢ Greater than 70% reporting to the higher confidence Measured and Indicated categories
- ➤ A maiden Measured and Indicated Resource<sup>2</sup> of:

# 4.5mt at 2.8% copper and 0.7g/t gold for 129,000t of copper and 106,000oz of gold

reported for the hangingwall high grade zone ("HW-HGZ") at PB East<sup>3</sup>

- ➤ The above is being targeted for pre-commercial development under the low-capex, accelerated, start-up strategy
- The resource model highlights good continuity of the HW-HGZ, which averages approximately seven metres in thickness and affirms expectations of employing low cost underground mining methods
- The updated resource model represents a key input for mine design and costing
- Studies are well advanced evaluating the feasibility of an expandable 1,000t/day underground mining operation from the HW-HGZ
- ➢ It is envisaged that initially ore will be transported to Antas for treatment facilitating a near term increment in Avanco's copper production⁴
- Management view a pre-commercial start-up as a prudent strategy in the current copper price environment. This approach keeps PB moving towards a near term development decision and can be readily expanded to a larger scale operation as market conditions improve



## 1. PEDRA BRANCA RESOURCE UPGRADE

Pedra Branca ("PB") is the Company's second and much bigger copper project located 50km southwest of Antas North (Stage 1). A revised PB East resource model has been completed incorporating results from a 1,790m infill drill programme in the East zone.

The updated PB East Mineral Resource estimate is comparable in size to the July 2015 estimate with over 70% now reporting to the higher confidence Measured and Indicated categories.

Pedra Branca East: May 2016 Mineral Resource Estimate (above a cut-off grade of 0.9% Cu)						
DEPOSIT	Category	Million Tonnes	Cu (%)	Au (g/t)	Copper Metal (T)	Gold Metal (Oz)
Pedra	Measured	1.98	2.7	0.7	53,000	43,000
Branca East	Indicated	5.72	2.8	0.7	161,000	123,000
Last	M + I	7.70	2.8	0.7	214,000	166,000
	Inferred	2.78	2.7	0.6	75,000	55,000
	Total	10.48	2.8	0.7	289,000	221,000

A maiden resource is reported for the hangingwall high grade zone ("HW-HGZ") within the PB East orebody, of which 4.5mt at 2.8% copper and 0.7g/t gold is classified in the higher confidence Measured and Indicated categories and is the focus for the proposed precommercial underground mine.

Pedra Branca East HW-HGZ: May 2016 Mineral Resource Estimate (above a cut-off grade of 0.9% Cu)						
DEPOSIT	Category	Million Tonnes	Cu (%)	Au (g/t)	Copper Metal (T)	Gold Metal (Oz)
Pedra	Measured	1.3	2.90	0.70	38,000	30,000
Branca East	Indicated	3.2	2.80	0.70	91,000	76,000
Last	M + I	4.5	2.8	0.70	129,000	106,000
	Inferred	2.4	2.40	0.50	37,000	27,000
	Total	6.1	2.7	0.70	166,000	133,000

There has been a marginal decrease in global tonnage in comparison to the July 2015 PB East estimate resulting from more accurate definition of the plunging shoot geometry and removal of some low confidence Inferred Resource zones. The overall copper grade remains unchanged at 2.8%, while the gold grade has increased by 13% to 0.7g/t.

The following table provides a comparison between the July 2015 and May 2016 resource estimates for PB East.

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		July 2015 ource estin			May 2010 ource esti	6 Mineral mate		Compariso	on
	Tonnes (mt)	Grade (Cu %)	Grade (Au g/t)	Tonnes (mt)	Grade (Cu %)	Grade (Au g/t)	Tonnes	Grade (Cu %)	Grade (Au g/t)
TOTAL	11.39	2.78	0.62	10.48	2.8	0.7	-8%	0%	+13%

## 2. PEDRA BRANCA STUDY

A pre-commercial start-up mine, targeting early development of the PB deposit is being evaluated. Underground mining will develop ore in the HW-HGZ, averaging 7m thickness, being the highest grade, largest and most continuous mineralised zone.

The substantial thickness of the HW-HGZ will reduce mining dilution and the overall resource update underscores the selection of "sub-level open stoping" as the preferred low cost mining method.

The updated resource model represents a key input for mine design, costings and economics. The resource is also an essential input for confirming the location of the boxcut, portal and decline.

A number of implementation schedules are being examined. The most aggressive plan assumes commencement of the box-cut/decline as early as Q3 2016<sup>4</sup>, with first ore extraction during Q2/Q3 2017. Over the following 24 months, ore extraction will ramp-up to approximately 1,000 tonnes per day.

Ore will be transported to Antas for treatment facilitating a near term increment in Avanco's copper production<sup>4</sup>.

Management view a pre-commercial start-up as a prudent strategy in the current copper price environment. This concept not only increment's Avanco's copper output in the near term but targets the project to be to expanded to a larger scale operation as market conditions improve.

Updates on study outcomes will be provided as and when they are completed.

**Tony Polglase** 

**Managing Director** 



#### **ABOUT AVANCO**

- Avanco (ASX: AVB) is an emerging mid-tier copper company situated in the mining friendly, world class Carajas Mineral Province of Brazil
- Avanco either owns, or holds the rights to 100% of the second largest area of mineral tenure in the Carajas region behind Vale
- ➤ The Company is well positioned to potentially operate a number of high grade, low cost copper-gold mines in the region, which will establish Avanco as a profitable long life producer
- Management has been successful in financing the development of Antas via an equity capital raising placing Avanco in a strong position being fully funded into production whilst remaining debt and covenant free
- ➤ The commissioning of Antas and ramp-up to commercial production is advancing to plan and is expected to produce around 12,000tpa of copper in concentrate (with 7,000ozpa of gold credits) from 2016, increasing to 15,000tpa by 2018
- Antas is producing a desirable, clean copper concentrate and the Company has executed a three-year offtake contract
- ➤ The future development of the nearby Pedra Branca underground project has the potential to increase Avanco's production to ~50,000tpa of copper in 4-5 years. Study of an initial, smaller scale operation is at an advanced stage as a pre-cursor to full scale development
- The Company is well supported by institutional shareholders with Blackrock World Mining Trust, Appian Natural Resources Fund, Greenstone Resources and Glencore currently holding ~57% of the issued capital
- Avanco is managed by highly experienced international and Brazilian mining professionals, most of whom are Portuguese speaking and reside in Brazil
- Whilst near term priorities are focused on mine life growth, Brazil offers significant opportunities to enhance shareholder value through new discoveries, acquisitions or partnerships with neighboring majors and other companies

### For further information, please contact:

#### **Phil Retter**

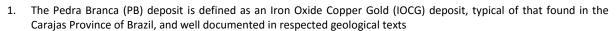
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	CARAJAS	- TOTAL JORC	Reporte	ed M	ineral F	Resources <sup>5,6,</sup>	7,8,9	
DEPOSIT	Category	Million Tonnes	Cu (%)	Au ( <sub>l</sub>	ppm)	Copper Metal (T)	_	old al (Oz)
	Measured	1.98	2.7	C	0.7	53,000	43	3,000
DD 5+10	Indicated	5.72	2.8	C	0.7	161,000	12	3,000
PB East <sup>10</sup>	Inferred	2.78	2.7	C	0.6	75,000	55	,000
	Total	10.48	2.8	C	0.7	289,000	22	1,000
	Indicated	4.46	2.04	0.	61	91,000	87,	000
PB West <sup>10</sup>	Inferred	2.74	1.72	0.	56	47,000	49,	000
	Total	7.19	1.92	0.	59	138,000	136	,000
PEDRA BRANCA	Total	17.67	2.44	0.	65	427,000	357	,000
	Measured	2.83	3.01	0.	72	85,000	66,	000
ANITAC NORTHIO	Indicated	1.65	2.20	0.	42	36,000	22,	000
ANTAS NORTH <sup>10</sup>	Inferred	1.9	1.59	0.	23	30,000	14,	000
	Total	6.38	2.38	0.	50	152,000	102	,000
	Measured	0.59	1.34	0.	18	8,000	3,0	000
ANITAC COUTUII	Indicated	7.50	0.7	0	.2	53,000	49,	000
ANTAS SOUTH <sup>11</sup>	Inferred	1.99	1.18	0	.2	24,000	13,	000
	Total	10.08	0.83	0	.2	85,000	65,	000
TOTAL		34.13	1.95	0.	.49	664,000	524	4,000
	ANTAS I	NORTH – JORG	C Report	ed O	re Rese	erves <sup>12,13</sup>		
Classification	Туре	Economic Cut- Off Cu%	Tonne (Mt)	I	Copper (%)	Gold (g/t)	Copper Metal (T)	Gold (Oz)
Proved	ROM Ore	0.90	1.385	5	3.62	0.74	50,137	33,046
Probable	ROM Ore	0.90	1.264	ı	2.72	0.57	34,381	23,231
PROVEN + F	ROBABLE R	OM ORE	2.649	9	3.19	0.66	84,518	56,277
Proved	Low Grade	0.65	0.342	2	0.74	0.30	2,531	3,308
Probable	Low Grade	0.65	0.635	5	0.72	0.23	4,572	4,709
TOTAL PROVEN + PROBABLE			3.63	3	2.53	0.55	91,621	64,294

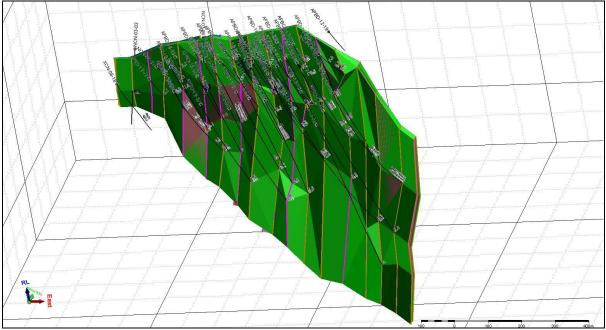
### **Competent Persons Statement**

The information in this report that relates to Mineral Resources is based on information compiled by Mr Dmitry Pertel, who is a member of the Australian Institute of Geoscientists (MAIG), and is an employee of CSA Global Pty. Ltd. Mr Pertel has sufficient experience 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 Mineral Resources and Ore Reserves". Mr Pertel consents to the inclusion of such information in this report in the form and context in which it appears.

The information in this report that relates to Exploration Results is based on information compiled by Mr Simon Mottram who is a Fellow of the Australasian Institute of Mining and Metallurgy. Mr Mottram is an Executive Director of Avanco Resources Limited; in which he is also a shareholder. Mr Mottram 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 (CP) 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 Mottram consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.



- 2. JORC Reported Mineral Resource. The announcement includes an updated Mineral Resource estimate for the PB East zone which hosts the hangingwall high grade zone (HW-HGZ) within it
- The HW-HGZ is defined as a geologically distinct zone of higher grade mineralisation that sits on the hangingwall contact of PB East. It is the widest and most prominent high grade zone within PB East and persists throughout the entire deposit
- 4. A decision to start mining at PB will include consideration of all variables, including CAPEX, OPEX, the feasibility of processing PB ore at the Antas plant, commodity prices, and the Company's cash positon
- Refer ASX Announcement "Resource Upgrade Advances Pedra Branca Development Strategy", 26 May 2016, for Competent Person's Consent, material assumptions, and technical parameters underpinning the Pedra Branca resource estimates
- 6. See ASX Announcement "Pedra Branca Resource Upgrade Delivers Substantial Increase in Both Contained Copper and Confidence", 13 July 2015, for Competent Person's Consent, material assumptions, and technical parameters underpinning the Pedra Branca resource estimates
- 7. See ASX Announcement "Stage 1 set to excel on new high grade Copper Resource", 7 May 2014, for Competent Person's Consent, material assumptions, and technical parameters underpinning the Antas North resource estimate
- See ASX announcement "Major Resource Upgrade for Rio Verde", 8 February 2012, for Competent Person's Consent, material assumptions, and technical parameters underpinning the Antas South resource estimate
- The Antas South JORC compliant resource was prepared and first disclosed under the JORC Code 2004. It has not been updated since to comply with the JORC Code 2012, on the basis that the information has not materially changed since it was last reported
- 10. Grade Tonnage Reported above a Cut-off Grade of 0.9% Copper
- 11. Grade Tonnage Reported above a Cut-off Grade of 0.3% Cu for Oxide Resources
- 12. See ASX Announcement "Maiden Reserves Exceed Expectations for Antas Copper", 17 September 2014, for Competent Person's Consent, material assumptions, and technical parameters underpinning the Antas North JORC (2012) Reported Reserve estimate
- 13. Measured and Indicated Resources are inclusive of those Mineral Resources modified to produce the Ore Reserves



Wireframe model showing extent of the modelled PB East mineralisation (looking north)



The following Table and Sections are provided to ensure compliance with the JORC Code (2012 Edition)

# **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.	Diamond drilling core is cut in half onsite using an industry standard core saw, perpendicular to mineralisation or geology to produce two identical (mirrored) halves. Samples are collected consistently from the same side of cut core, sent to an internationally accredited independent assay laboratory, and analysed for a suite of elements by appropriate analytical techniques for the style and type of Iron Oxide Copper Gold (IOCG) mineralisation.
	• Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	• The drill hole collar locations are surveyed by a Global Positioning System (GPS) instrument, and surveyed accurately (centimetre precision) after completion. Drill samples are logged for lithology, weathering, structure (diamond core), mineralogy, mineralisation, colour and other features. Logging and sampling is carried out according to Avanco protocols and QAQC procedures as per industry standard, and overseen by Avanco's Geological Managers and the Competent Person (CP).
	<ul> <li>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.</li> </ul>	<ul> <li>Diamond core is HQ and NQ in size, sampled on mineralised intervals or regular 1.0 m intervals in wide mineralised zones. Core is cut in half to produce sample weights of 3–5kg. Samples are crushed, dried and pulverised (total prep) to produce a sub-sample for analysis. Using a four-acid digest, drill core samples are analysed for Cu, Ni (ICP) and Au (Fire Assay, 50g). Mineralised zones and samples with &gt;2,000 ppm Cu are further analysed for "Ore Grade" Cu by Atomic Absorption Spectrometry (AAS). Additional elements may be assayed based on geological observations.</li> </ul>
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).	Diamond drilling is a combination of HQ and NQ. Core is reconstructed into continuous runs on an angle iron cradle orientation device.



Criteria	JORC Code explanation	Commentary
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed.	Diamond core recoveries are logged and recorded in the database. Overall recoveries are consistently >95% in oxide and >99% in fresh rock. Drill sample recoveries are recorded as an average for each metre and recorded in the database. Recoveries are excellent and there are no known sample recovery problems, with the exception of the soil profile.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	Diamond core is reconstructed into continuous runs on an angle iron cradle for recovery measurement and core orientation. Depths are checked against those marked on the core blocks, and against the drilling company's records.
	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.	There is no known sample bias or potential for sample bias.
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.	<ul> <li>Drill samples are logged for lithology, weathering, structure (diamond core), mineralogy, mineralisation, colour and other features. Logging and sampling is carried out according to Avanco protocols and procedures as per industry standard, and overseen by the Company's Geological Managers. The Company believes that the level of detail and quality of the work is appropriate to support current and future studies.</li> </ul>
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.	Drill samples are logged for lithology, weathering, structure (diamond core), mineralogy, mineralisation, colour and other features. Core is photographed both wet and dry.
	The total length and percentage of the relevant intersections logged.	All drill holes are logged in full from start to finish of the hole.
Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken.	<ul> <li>Where sampled, core is cut in half onsite using an industry standard core saw, perpendicular to mineralisation or geology to produce two identical (mirrored) halves. Samples are collected consistently from the same side of cut core.</li> </ul>
	If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.	All drilling to date has been by diamond core.
	For all sample types, the nature, quality and appropriateness of the	Sample preparation is according to industry standard, including oven drying,



Criteria	JORC Code explanation	Commentary
	sample preparation technique.	coarse crush, and pulverisation to 85% passing 100μm or better.
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	<ul> <li>Avanco uses an industry standard QAQC programme involving Certified Reference Materials "standards" for Cu (with Cu grades ranging from low to very high), and blank samples, which are introduced in the assay batches at an approximate rate of one control sample per 20 normal samples. These QAQC results are reported along with the sample values in the preliminary and final analysis reports. Umpire checking of the Primary laboratory is then carried out by a Secondary laboratory. Both are internationally accredited independent assay laboratories.</li> </ul>
	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.	Duplicates are inserted at an approximate rate of 1 duplicate per 40 normal samples. Umpire checking of the Primary laboratory is then carried out at by a Secondary laboratory, at an approximate rate of 1 control sample per 20 normal samples, or a minimum of 3 umpire samples per hole.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	Sample sizes are considered to be appropriate and correctly represent the style and type of mineralisation.
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.	<ul> <li>Assaying uses a four acid digest, which is a standard industry method for Base and Precious metals analysis. The acids used are hydrofluoric, nitric, perchloric and hydrochloric acids, suitable for silica based samples. The method approaches total dissolution of most minerals. "Ore grade" Cu is further analysed by an accredited AAS "Ore Grade" analysis method. The analysis is considered total and appropriate.</li> </ul>
	• 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.	• It is the Company's policy not to use in-house tools to determine reportable results for anything other than regional soil sampling. Portable XRF's are used internally by Company geologists to assist in geological and mineralogical interpretation.
	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.	Avanco uses an industry standard QAQC programme involving Certified Reference Cu Materials "standards" (with Cu grades ranging from low to very high), blank samples, duplicates and Umpire Laboratory check sampling. Data is analysed and reported internally on a monthly basis for accuracy, precision, repeatability and various biases.



Criteria	JORC Code explanation	Commentary
Verification of sampling and	The verification of significant intersections by either independent or alternative company personnel.	Avanco's Exploration Manager (>30 years' experience) and senior exploration geologist visually verify significant intersections and results.
assaying	The use of twinned holes.	The Company uses twin holes routinely in the more advanced stages of resource definition drilling, and for metallurgical drilling.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	<ul> <li>Primary data is collected on Excel templates with detailed geological and structural logging recorded on paper. Information is transferred, validated, complied, and managed by the Company's in-house database manager in a relational database. All Company Intellectual Property is stored on a central server, kept in a secure and environmentally controlled room. Automated tape back-up occurs on a nightly basis and duplicate back-ups are regularly rotated "off-site" as a secondary precaution in case of loss of the Server site.</li> </ul>
	Discuss any adjustment to assay data.	No adjustments or calibrations are made to assay data.
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.	Collar locations are surveyed by GPS on the State Survey Datum using true Mean Sea Level RL's, and surveyed accurately (centimetre precision) after completion Downhole surveys are completed using a Maxibor digital downhole tool with readings taken every 3 m.
	Specification of the grid system used.	Universal Transverse Mercator, SAD69 Zone 22 South.
	Quality and adequacy of topographic control.	Regional Topographic control (1 m contours) and Digital Terrain Models are used. The whole Pedra Branca area has been accurately surveyed on ground, survey points are nominally 30m apart, and more detailed in areas with greater relief.
Data spacing and distribution	Data spacing for reporting of Exploration Results.	• The current drill spacing at Pedra Branca East is nominally 50 m by 50 m. The drill holes completed in the current programme and discussed in this report, closes the drill spacing to a nominal spacing of 50 m by 25 m in the core of the deposit. This was completed to increase Mineral Resource confidence and support later studies.



Criteria	JORC Code explanation	Commentary
	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.	• Sufficient continuity in both geology and mineralisation has been established to support the classification of Mineral Resources reported herein under the JORC Code (2012). As the Company progresses resources to higher levels of confidence it will collect appropriate data to ensure compliance with any new classification.
	Whether sample compositing has been applied.	• In the JORC Code reported Mineral Resource estimate, the majority of samples are 1 m in length with only a small number of (mostly end of hole) samples being larger than 1 m long, or less than 1 m where core samples are cut to the limit of mineralisation. In these cases, samples are composited to 1 m. Statistical analysis shows that this has no effect due to their location.
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.	<ul> <li>Geology and mineralisation at Pedra Branca is approximately sub-vertical, dipping slightly to the south. Thus the majority of drilling is angled to the north, dipping at an angle aimed at achieving the most representative intersections.</li> </ul>
	<ul> <li>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.</li> </ul>	The company does not believe that any sample bias has been introduced.
Sample security	The measures taken to ensure sample security.	• Chain of custody is managed by Avanco. All core samples are received intact and in their entirety in their core trays at the Company's secure Core Yard in Parauapebas, Para, Brazil. All sampling and work on the samples is carried out within the confines of this secure facility. Samples are delivered by Avanco personnel directly to the laboratory in Parauapebas and thus at no point do the samples leave the possession of Avanco staff prior to arriving at the laboratory. Avanco has protocols and procedures for tracking the progress of the samples through the laboratory, ensuring accurate validation and authentication of results issued by the laboratory in relation to the samples that were submitted.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	CSA Global Pty Ltd (CSA Global) competed a full onsite (in Brazil) review of all Company drilling, sampling, data and exploration management



Criteria	JORC Code explanation	Commentary
		procedures from start to finish, including a visit to the independent laboratory facilities, as part of their own due diligence in 2012, prior to commencing Mineral Resource estimation work for Avanco on the Company's projects in Brazil. Avanco received a very favourable review, with no area needing any significant change or improvement, or any concern with the quality and integrity of data received by CSA Global from Avanco.

# **TABLE 1 – Section 2: 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.	<ul> <li>AVB MINERAÇÃO Ltda and VALE DOURADO MINERAÇÃO Ltda are wholly owned Brazilian subsidiaries of Avanco Resources Ltd, who own the rights to 100% of the tenements in the current exploration drill programme. Existing third party Royalties amount to 3% NSR on Cu and 25% NSR on Au. State royalties amount to 2% NSR on Cu and 1% NSR on Au. Unless negotiated otherwise with the owner, the surface rights owner (farmer) receives a royalty equal to 50% of the State royalty.</li> </ul>
	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.	All tenements are granted exploration licenses
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	AVB's CP has determined that the quality and integrity of historical work is adequate for inclusion, consideration and interpretation in the current work programme.
Geology	Deposit type, geological setting and style of mineralisation.	Iron Oxide Copper Gold (IOCG) breccia pipe, hosted predominantly by mafic metavolcanic and granitic rocks.



Criteria	JORC Code explanation	Commentary
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:	Not relevant for the reporting of Mineral Resource estimates.
	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.	
	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.	Not relevant for the reporting of Mineral Resource estimates.
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.	Not relevant for the reporting of Mineral Resource estimates.
	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.	Not relevant for the reporting of Mineral Resource estimates.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No assumptions are included in this report, because Metal Equivalents have not been used.
Relationship between mineralisation widths and	If the geometry of the mineralisation with respect to the drill-hole angle is known, its nature should be reported.	<ul> <li>Geology and mineralisation at Pedra Branca is approximately sub-vertical, dipping slightly to the south. Thus the majority of drilling is angled to the north, dipping at an angle aimed at achieving the most representative intersections.</li> </ul>



Criteria	JORC Code explanation	Commentary
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').	Not relevant for the reporting of Mineral Resource estimates.
Diagrams	<ul> <li>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.</li> </ul>	Not relevant for the reporting of Mineral Resource estimates.
Balanced reporting	<ul> <li>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.</li> </ul>	Not relevant for the reporting of Mineral Resource estimates.
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.	All material and meaningful exploration data, relevant to the scope of work in this report, has been included in this report. There is no other information, which is available and/or in the opinion of the Company's CP is lacking in this report.
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 current drilling is in-fill in nature. Future work will consist of further in-fill drilling as required for Resource and Reserve work, and exploration at depth where mineralisation remains open and untested.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	Diagrams included in this report.



# TABLE 1 – Section 3: Estimation and Reporting of Mineral Resources

Criteria	JORC Code explanation	Commentary
Database integrity	<ul> <li>Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.</li> <li>Data validation procedures used.</li> </ul>	<ul> <li>The database is maintained by a database professional on site.</li> <li>The exploration database used for the Mineral Resource estimation has been validated and is considered accurate.</li> </ul>
Site visits	<ul> <li>Comment on any site visits undertaken by the Competent Person and the outcome of those visits.</li> <li>If no site visits have been undertaken indicate why this is the case.</li> </ul>	The Competent Person (CP) for this Mineral Resource estimation is a full time employee of CSA Global. The site was visited previously by CSA Global employees who completed the QA/QC analysis, and who are is satisfied that industry standards have been adopted during field data collection programmes.
Geological interpretation	<ul> <li>Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.</li> <li>Nature of the data used and of any assumptions made.</li> <li>The effect, if any, of alternative interpretations on Mineral Resource estimation.</li> <li>The use of geology in guiding and controlling Mineral Resource estimation.</li> <li>The factors affecting continuity both of grade and geology.</li> </ul>	<ul> <li>Wireframe interpretations were completed by CSA Global based on sectional interpretation of the mineralisation.</li> <li>Wireframes were generated based on 50 m spaced cross sections. This was based on exploration and grade control drilling patterns.</li> <li>The mineralised boundaries are considered robust, and alternative interpretations do not have the potential to impact significantly on the Mineral Resource.</li> <li>Mineralisation cut-off grades (0.2% Cu for the low grade domain and 1.0% Cu for the high grade domain) were used to define the mineralised envelopes.</li> <li>Continuity along strike and at depth of grade (mineralisation) and geology is well defined by alteration and structure (the breccia).</li> </ul>
Dimensions	The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.	<ul> <li>Mineralisation at the Pedra Branca East extends from 6,606,500 m E to 607,500 m E, 9,272,500 m N to 9,273,200 m N, and from about 10 m below surface to beyond the depth of current drilling. Within the deposit there are multiple lodes generally striking east-west and dipping towards the south at 70° to 80°.</li> </ul>



Criteria	JORC Code explanation	Commentary
		• 1 m composites were created and used for statistical analysis, variography and estimation.
Estimation and modelling techniques	<ul> <li>The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.</li> <li>The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.</li> <li>The assumptions made regarding recovery of by-products.</li> <li>Estimation of deleterious elements or other non-grade variables of economic significance (eg sulphur for acid mine drainage characterisation).</li> <li>In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.</li> <li>Any assumptions behind modelling of selective mining units.</li> <li>Any assumptions about correlation between variables.</li> <li>Description of how the geological interpretation was used to control the resource estimates.</li> <li>Discussion of basis for using or not using grade cutting or capping.</li> <li>The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.</li> </ul>	<ul> <li>Thorough univariate statistical analysis of weighted by length 1 m downhole composites, flagged for mineralogy has been completed for copper and gold in each mineralogical domain. Top-cuts were used where applicable.</li> <li>Statistical analysis indicated that outlier management was crucial to prevent severe high grade smearing that could result in potential overestimation for some elements. The approach used has been capping (Top-cuts were defined by domain, following thorough examinations of histograms, probability curves and the spatial locations of the outliers). Top cuts ranged from 2.4% Cu to 14% Cu and 1.2 g/t Au to 4.5 g/t Au, based on analysis of individual domain statistics.</li> <li>Variogram modelling was completed using Micromine software and used to assess the spatial continuity of copper and gold mineralisation within all lodes. Variogram parameters were used in the interpolation and classification processes.</li> <li>Directional ranges have been determined from variogram modelling and are used to constrain the search distances used in block grade interpolation, incorporating geologists' interpretations of ore geometry and continuity. Estimation search strategies implemented have sought to ensure robust estimates while minimising conditional bias. Three search estimation runs were used with initial short-search runs extending the sample influence in later runs.</li> <li>Block estimation has been completed within Micromine 2014 software. These wireframes were used as hard boundaries for the interpolation.</li> <li>A flattening algorithm was used to flatten all modelled lodes to a vertical plane.</li> <li>Ordinary Kriging was used for block grade estimation using uniquely coded 1 m composite data for respective lodes.</li> </ul>
		All block estimates are based on interpolation into parent blocks. Parent



Criteria	JORC Code explanation	Commentary
		block estimates are then assigned to sub-blocks. The Mineral Resource estimate does not include any form of dilution.
		• The block model extends from local grid 606,500 m E to 607,500 m E, 9,272,500 m N to 9,273,300 m N and from -1000 m RL to 350 m RL.
		Six variables, namely copper, gold, silver, nickel, cobalt and density were estimated.
		No selective mining units were assumed in this estimate.
		Standard model validation has been completed using visual and numerical methods and formal peer review sessions by key geology staff.
		The Mineral Resource block model has been validated visually against the input composite/raw drill hole data with sufficient spot checks carried out on a number of block estimates on sections and plans.
		Easting, northing and elevation swath plots have been generated to check input composited assay means for block estimates within swath windows.
		A comparison of the block volume weighted mean versus the drill hole cell de-clustered mean grade of the composited data was undertaken.
Moisture	Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	Tonnages are estimated on a dry basis.
Cut-off parameters	The basis of the adopted cut-off grade(s) or quality parameters applied.	• The Mineral Resource is reported above a cut-off grade of 0.9% Cu, which is considered reasonable for an underground operation. Top-cuts were defined by domain, following thorough examinations of histograms, probability curves and the spatial locations of outliers. Top cuts ranged from 2.4% Cu to 14% Cu and 1.2 g/t Au to 4.5 g/t Au, based on analysis of individual domain statistics.
Mining factors or assumptions	• Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding	<ul> <li>Underground mining design and a Pre-Feasibility Study is being carried out.</li> <li>Detailed mining assumptions such as dilution and minimum mining widths will be included in the optimisation, detailed mine planning and Life of Mine plan that will be completed in an Ore Reserve estimation.</li> </ul>



Criteria	JORC Code explanation	Commentary
	mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	
Metallurgical factors or assumptions	The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.	<ul> <li>Metallurgical amenability is based on comprehensive metallurgical test work that has been completed for the Pedra Branca deposit and the proposed flotation plant.</li> <li>This work includes preliminary, detailed and final metallurgical test work. Bench scale flotation test work has been completed, including production and detailed analysis of concentrate and tailings produced by this work. Finally, detailed analysis of design concentrates has been completed, including analysis of concentrate grades and deleterious elements.</li> </ul>
Environmental factors or assumptions	• Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.	<ul> <li>Bench scale flotation test work has been completed. This includes production of tailings and tailings analysis. This data has been fed into the tailing dam engineering design, which is in progress.</li> <li>Sulphide material mined from the operation will be processed in the concentrator, while waste rock characterisation is in progress.</li> </ul>
Bulk density	<ul> <li>Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.</li> <li>The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and alteration zones within the deposit.</li> </ul>	<ul> <li>The Pedra Branca East drill database includes 1336 density measurements.</li> <li>Data has been selected to cover in detail all possible mineralisation types and rocks types and over the full range of depth and width of the deposit.</li> <li>Data has been collected from diamond drill core, and all work performed by the same accredited independent assay laboratory that completed the sample assays.</li> <li>The measurement procedure followed four steps:</li> </ul>



Criteria	JORC Code explanation	Commentary
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	<ol> <li>A sensitive balance was fitted with a fishing line harness which could hang freely below and then recalibrated to zero.</li> </ol>
		2. A specimen was placed in the harness and weighed in air.
		<ol><li>A water vessel was raised below to immerse the specimen, which was then weighed in water.</li></ol>
		<ol> <li>The appropriate values were substituted into the formula BD = weight in air / (weight in air – weight in water).</li> </ol>
		The Pedra Branca East Mineral Resource have been classified and reported in accordance with The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code 2012 Edition). Resource classification is based on confidence in the geological domaining, drill spacing and geostatistical measures.
Classification	<ul> <li>The basis for the classification of the Mineral Resources into varying confidence categories.</li> <li>Whether appropriate account has been taken of all relevant factors (ie relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).</li> <li>Whether the result appropriately reflects the Competent Person's view of the deposit.</li> </ul>	• The initial classification process was based on the interpolation distance and minimum samples within the search ellipse as defined by macros in MicroMine mining software. An initial classification was carried out as follows. The Mineral Resource was classed as Measured if blocks were interpolated using search based on two thirds of the modelled semi-variogram ranges, Indicated – within full semi-variogram ranges, and all the rest – Inferred The initial classification was then reviewed visually. Based on the initial classification, two solids were created to define Measured and Indicated Mineral Resources. These defined resource categories were based on a combination of data density and geological confidence.
		<ul> <li>Resource classification is defined in the model by the following codes: Measured Mineral Resource (class = 1), Indicated Mineral Resource (class = 2) and Inferred Mineral Resource (class = 3).</li> </ul>
Audits or reviews	The results of any audits or reviews of Mineral Resource estimates.	This Mineral Resource and estimation procedures have been reviewed internally within CSA Global. This Mineral Resource has not been audited externally.
		The processes for geological modelling, estimation and reporting of Mineral Resources is industry standard, and the process has been subject to an



Criteria	JORC Code explanation	Commentary
		<ul> <li>independent external review.</li> <li>CSA Global completed peer review from 2 through 4 May 2016, and found the Mineral Resource to be robust.</li> </ul>
Discussion of relative accuracy / confidence	<ul> <li>Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.</li> <li>The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.</li> <li>These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.</li> </ul>	<ul> <li>Mineral Resources has been classified and reported in accordance with the guidelines of the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves and reflects the relative accuracy of the Mineral Resources estimates.</li> <li>The current Mineral Resource model represents a robust global estimate of the in-situ mineralisation at the Pedra Branca East deposit.</li> <li>It is recommended that optimised pit shells and underground design are used as a guide to create drilling programmes that maximise the conversion from lower classification Mineral Resources (Inferred to Indicated) to higher classification Mineral Resources (Indicated to Measured) and reduce mining risk attributed to data density and quality. Careful consideration of mining dilution is warranted, as some internal waste between lodes will be difficult to exclude during mining.</li> </ul>