TERRAMIN AUSTRALIA LIMITED

ASX Announcement

12 February 2018

ISR Copper Resource at Kapunda

- **An Inferred Resource estimate of 47.4 million tonnes grading 0.25% copper, containing 119,000 tonnes of copper.**
- **Resource estimate only includes shallow mineralisation no deeper than 100 metres which is amenable to in situ recovery.**

Terramin Australia Limited (ASX:TZN) (**Terramin**) is pleased to announce that Terramin Exploration Pty Ltd (**TEL**), a wholly owned subsidiary of Terramin and its joint venture partner, Environmental Copper Recovery Pty Ltd (**ECR**) have completed the maiden in situ recovery **(ISR)** Resource estimate for the Kapunda copper project, located approximately 90 km north of Adelaide in South Australia, (Figure 1).

Terramin's Kapunda Resource has been estimated and reported in accordance with the guidelines of the 2012 edition of the Australasian Code for the Reporting of Exploration results, Mineral Resources and Ore Reserves ("2012 JORC Code").

The joint venture is investigating the potential to extract copper through ISR from the shallow mineralised halo around the historic Kapunda Mine workings. Following an extensive review of historical drill data, historical mining records along with additional test work, TEL and ECR have estimated a combined Resource of 47.4Mt at 0.25% copper using a 0.05% copper cut off (Table A).

Type	Mt	Copper (%)	Copper tonnes
Copper oxide	30.3	0.24	73,000
Secondary copper sulphide	17.1	0.27	46,000
Total	**47.4**	**0.25**	**119,000**

Table A: Kapunda 2018 Resource estimates reported at a 0.05% cut off.

The Resource estimate is only in respect of that part of the Kapunda mineralisation that is considered amenable to ISR (copper oxides and secondary copper sulphides) within TEL's tenement EL 5262 and only reports mineralisation that is within 100 metres of the surface (Figures 2 and 3).

Terramin's 2018 Resource estimate calculated for ISR is not reliably comparable to previous company Resource estimates which were done for extraction by open cut mining.

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Adelaide Chemical Co. Ltd. (ACC) 1992 estimate is the last documented Resource at 4.3 million tonnes @ 1.1% copper (47,000t copper). The ACC Resource was estimated for open cut mining and appears to have been a 2D polygonal estimate carried out using Surpac software, modelled at a 0.5% cut-off on 60m spaced sections and assumed a flat density of 2.0t/m^3.

Terramin's 2018 Resource estimate used Vulcan^{TM} software for 3D modelling of the copper mineralisation, block modelling, and grade and density estimation by ordinary kriging.

The recent advancements in ISR lixiviants and extraction technologies offer new methods that could be permitted to extract the copper. Kapunda has been considered a stranded deposit, with the Kapunda Mine historic site heritage listed and the proximity of the township of Kapunda. The ISR method is considered to be a viable method of extracting the copper in this location.

Figure 1. Kapunda located in Terramin's Adelaide Hills tenement package.

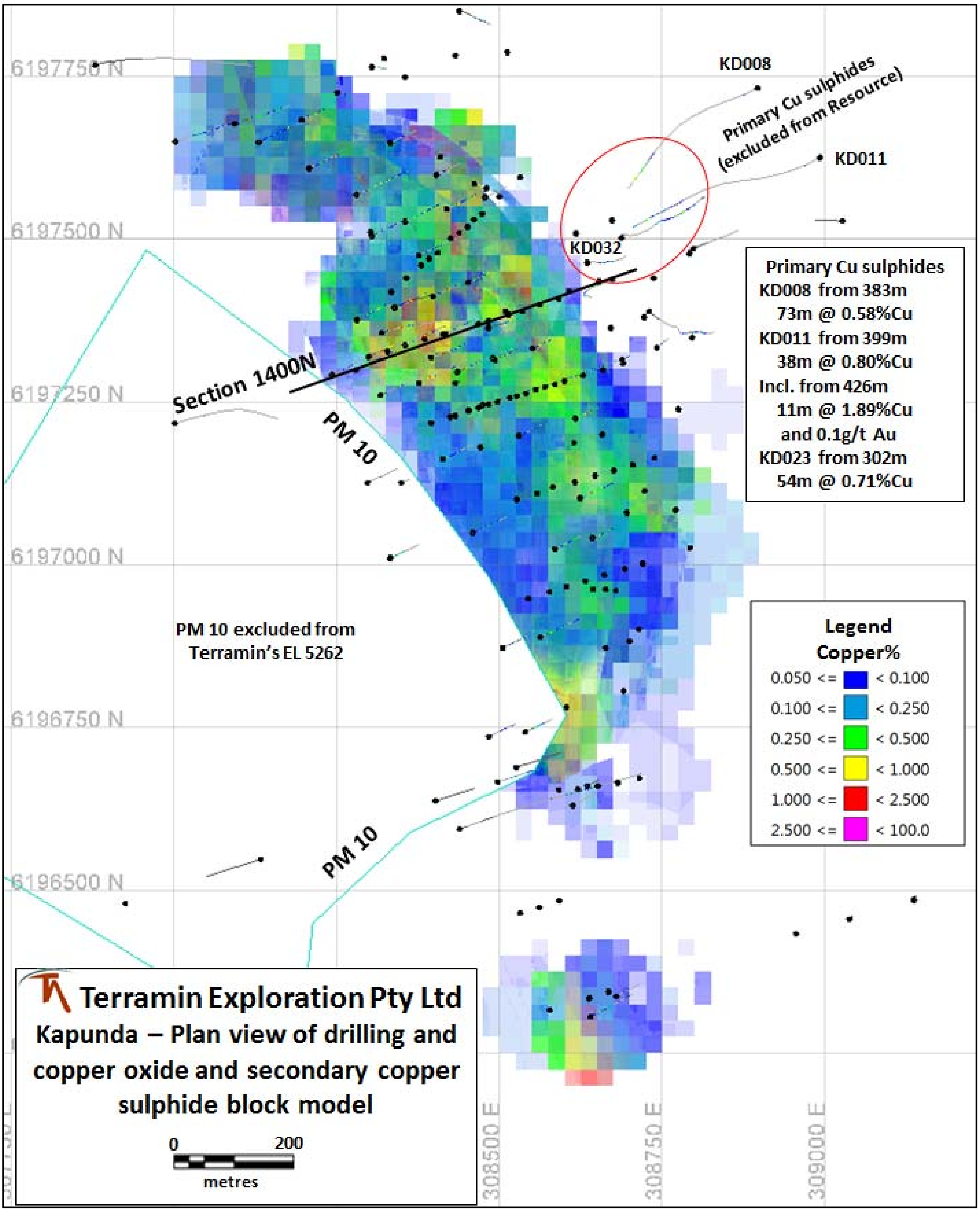

Figure 2. Kapunda plan view showing extent of block model and drillholes.

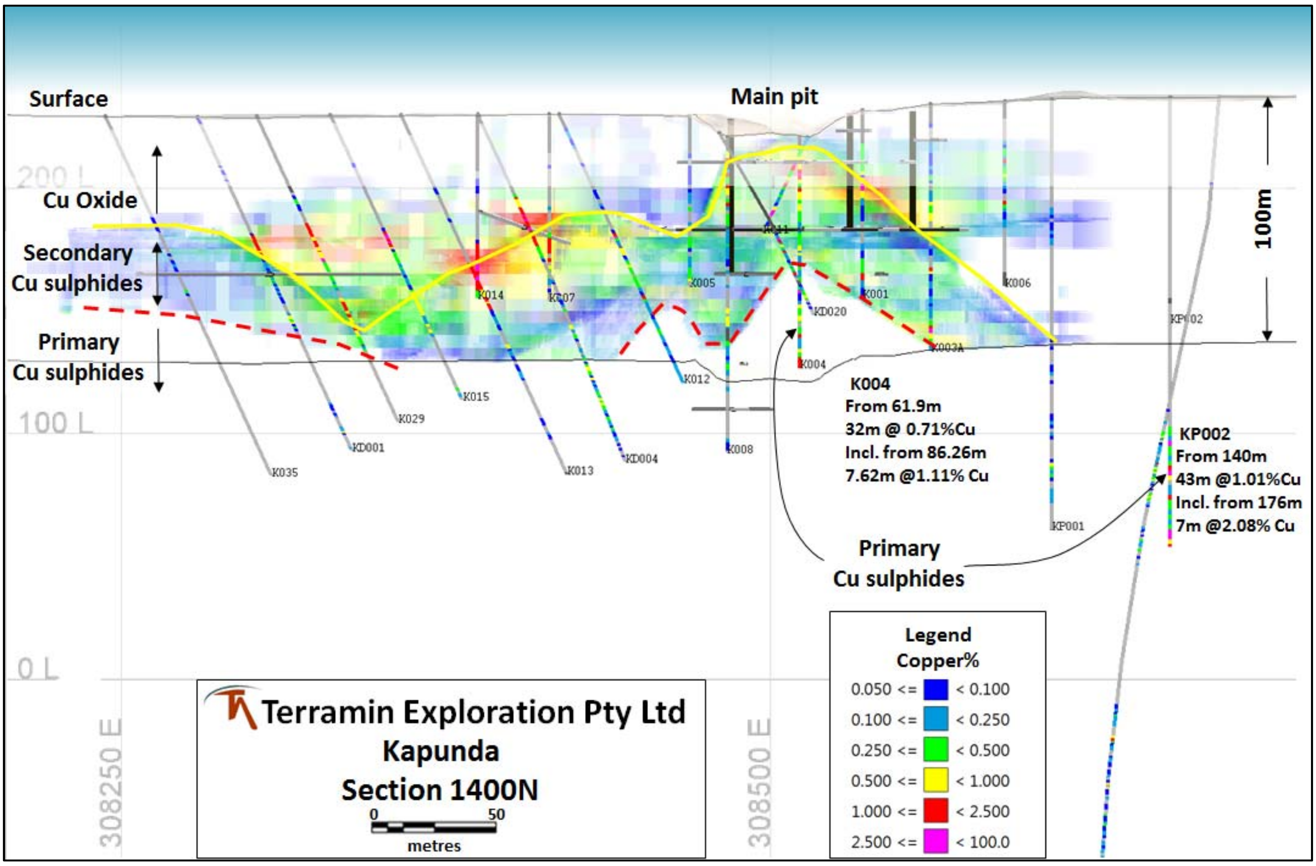

Figure 3. Kapunda cross section 1400N (looking north) showing drillholes and block model coloured by copper grade and historic workings (25m window).

Commenting on the Resource, Terramin's Martin Janes, said:

"Terramin is pleased with the outcomes of the Kapunda project to date. The Resource estimation at 119,000 tonnes of copper is above expectations and at the current copper price of approximately $US 7,000 per tonne the Company is eager to see the results of ECR's ISR modelling and testwork"

The studies at Kapunda will be undertaken under the terms of a joint venture agreement between TEL and ECR which is outlined in an ASX announcement dated 2 August 2017.

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Appendix 1 consists of Table 1: 'Assessment and Reporting Criteria Table Mineral Resource – JORC 2012'. This table is structured in three sections (1-3) that describe the Kapunda Mineral Resource estimate's compliance with the 2012 JORC Code requirements.

Competent Person's Statement

The information in this report that relates to Exploration Results and Mineral Resources is based on information compiled by Mr Eric Whittaker, a Competent Person who is a Member of the Australasian Institute of Mining and Metallurgy (AusIMM). Mr Whittaker is an employee and Principal Resource Geologist of Terramin Australia Limited. Mr Whittaker 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 thee 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Whittaker consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

1. APPENDICES

Checklist of Assessment and Reporting Criteria (JORC Code Table 1)

Section 1: Sampling Techniques and Data

Criteria	JORC Code explanation	Commentary
	• *Nature and quality of sampling (eg 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.*	Since the cessation of mining, Kapunda has been explored by numerous exploration companies. Five of these companies undertook drilling and their work is summarized below. Mines Exploration Pty Ltd's (Mines Exploration) (1965 – 66) drilled diamond core holes; KP1, KP2 and KP3. The core was manually split in half and sampled at 5-foot intervals. Mines Exploration's KV series rotary drillholes (1965-1966) – were sampled at 10-foot intervals using percussion and cyclone down to water table. Below the water table drill cuttings were extracted by water pumping and wet splitting of the sludge to 1/16th fraction. This fraction was collected in calico bags and air dried. The dried 1/16th fraction was weighed and further dry split with a Symons splitter to a final (4 pound) sample. Below the water table and before commencing sampling run the hole was carefully flushed, the sampling run completed then carefully flushed again before the next drilling run. Noranda Australia Ltd (Noranda) undertook a program of percussion drilling between March and April 1970. Drill cuttings were described and sampled at 5 to 10 foot intervals. For Northlands Minerals Ltd's K series diamond holes (1972-73) the core was carefully, placed onto plastic corrugated sheets to dry before being transferred to a core tray. Adhering material (drilling mud) was washed off. Holes were split in half manually from top to bottom; half core sample intervals of various lengths were selected by the Logging Geologist to be sent for assay. Utah Development Co.'s (Utah) KD series diamond holes (1974 -76) were manually split in half at 1m intervals, with one half submitted for assay and the other half retained. Utah's KP series percussion holes (1974 -1976) included several drilling methods: rotary drag bit, tri cone and percussion. Percussion drilling was main form with drag bit and tri cone only used to pre-collar holes. The drillholes were sampled at 2m intervals using a mechanical rotary splitter to homogenize the sample to ensure a representative split was obtained. For percussion drilling, hammer size started at 150 mm and was reduced to 130mm as hole depth increased. The 2008 drilling undertaken by Copper Range utilized reverse circulation with the first 6m collared using a 6 ½ inch hammer bit. Individual metre sample intervals were collected in 600x900mmx150um plastic bags fitted to a rig mounted cyclone. A sub sample for analysis was then collected in a calico bag by passing the whole metre sample through a two tier riffle splitter. A summary of the drilling undertaken at Kapunda is presented in table below. Diamond core holes — Total KP Mines Exploration (1965-66) — 3 K Northlands (1972-73) — 52 KD Utah (1974-76) — 23 Total diamond core holes — 78 Percussion Holes KV Mines Exploration (1966-67) — 43 M Noranda (1970) — 24

Criteria	JORC Code explanation	Commentary
		Z Noranda (1970) 1 KP Utah (1974-76) 36 SM Copper Range (2008) 1 SK Copper Range (2008) 4 Total percussion holes 109 **Total drillholes 187** Total meterage of all drillholes - 22,712.8m.
	• *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.*	Core was aligned and measured by tape, comparing back to downhole core blocks consistent with industry practice. Documentation indicates that the diamond and percussion drilling was completed by previous operators to industry standard at that time.
	• *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 (eg '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 (eg submarine nodules) may warrant disclosure of detailed information.*	KV series holes with 10 foot sample intervals have resulted in broader and more uniform grade intersections. The initial K series diamond drillholes suffered recovery problems but after concerted effort recoveries improved with the program. Core loss intervals in the Mineral Resource estimate were assumed to have a zero grade. Core loss is not thought to seriously affect the Mineral Resource estimate. Sampling was to industry standard at the time of drilling, with samples collected from various interval sizes depending on the company involved. Samples were assayed at certified laboratories.
Drilling techniques	• *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg 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).*	KV series drillholes were rotary percussion drilling conducted with a Boyles Brothers truck mounted rotary drill rig using $4^1/_2$ inch and $2^{15}/_{16}$ inch bits. KP1, 2 and 3 were diamond holes were cored using f foot triple tube NX core barrel. Noranda's M and Z series holes were percussion drilled by Northbridge Pty Ltd. For the K series holes various core lifters, bits, core barrels and drilling muds were used. The best combination was a basket lifter with a side-discharge bit (modified face discharge bit to prevent blocking), drilling with mud (Unical, Supergel etc.) and using a normal NQ barrel. In softer rock a dry method of drilling was used that consisted of driving an NQ core barrel ahead of a down-the-hole hammer. Distortion was always present, but relatively minor. KP series holes utilised a mix of rotary drag, tricone and percussion with the majority of the drilling being percussion. The rotary drag and tricone bits being used primarily for collaring were not sampled. KD series holes were drilled with a Longyear 38 by Boring Enterprises Pty Ltd and were primarily NQ core size with some intervals of BQ and HQ. Core was orientated using a contractor constructed device. Copper Range's SK series holes were drilled using reverse circulation.
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.*	Core recovery was measured for each drill run between the driller's marker blocks. KV series percussion holes had chip sample bags were weighed to compare with expected mass to assess recovery/loss.

Criteria	JORC Code explanation	Commentary
		K series sample recoveries were visually estimated and recorded for each interval. No historic information is available for KP series holes.
	• *Measures taken to maximise sample recovery and ensure representative nature of the samples.*	The historic records describe in length (as detailed above) the efforts that went into maximizing core recovery.
	• *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.*	Statistical analysis indicates no significant sample bias caused by preferential loss/gain of course/fine material. The KV series rotary holes which were sampled at 10 foot intervals yielded broader and more uniform grade within the mineralized zones. Average copper grade of the KV holes above the water table was 0.246% versus 0.253% below the water table.
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.*	All drillholes have been geologically logged for recovery, lithology, mineralisation and colour with abundant petrographical and petrological studies to adequately support the Mineral Resource estimation, mining studies and metallurgical studies. KV series holes were logged in their – entirety for recovery, and colour. Four petrological samples were also described. KP1, 2 and 3 holes were logged in their entirety for lithology, mineralisation, colour and texture. K series holes were logged for recovery, rock type, mineralisation and a geological description which included, colour, texture and grainsize. A total of 98 petrographic samples and 70 petrological samples were described. KD series holes were photographed and were geologically logged for rock type, structure, mineralogy and physical character. KP series holes were logged in their – entirety for rock type, mineralogy and physical characteristics. Geotechnical logging has been undertaken by Environmental Copper Recovery Pty Ltd (ECR) geologists on drill core stored at the South Australian Drill Core Reference Library.
	• *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.*	Logging is qualitative based on visual field estimates. Qualitative code logging was conducted for lithology, alteration, veining, tone and colour. Fifteen holes stored at the South Australian Drill Core Reference Library have been scanned by Hylogger. The HyLogger core scanner is a rapid spectroscopic imaging system developed by CSIRO's Mineral Mapping Technologies Group. The HyLogger uses visible and infrared spectroscopy (wavelength range 300-2500nm and 6000-14500nm), and digital imaging, to characterise and identify dominant mineral species on core, chips and pulps, at spatial resolutions of ~1cm (spectral data) and ~0.1mm (image data).
	• *The total length and percentage of the relevant intersections logged.*	Entire holes are logged in all instances.
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.*	Core from diamond drilling programs was either split manually or sawn, with half core sent to lab for assay and half core retained. Sample intervals were defined by the Logging Geologist along geological boundaries.

Criteria	JORC Code explanation	Commentary
	• *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.*	KV series rotary drillholes were sampled at 10 foot intervals down to water table using air blast and cyclone. Below the water table drill cuttings were extracted by pumping and wet splitting of the sludge to $^{1}/_{16}{}^{th}$ fraction. This fraction was collected in calico bags and air dried. The dried $^{1}/_{16}{}^{th}$ fraction was weighed and further dry split with a Symons splitter to a final (4 pound) sample. Below the water table and before commencing the next sampling run the hole was carefully flushed, once the sampling run completed the hole was carefully flushed again before the next drilling run. KP series percussion holes were sampled at 2m intervals using a mechanical rotary splitter to homogenize the sample from which representative split was obtained. For percussion drilling, hammer size started at 150mm and was reduced to 130mm as hole depth increased. (Env02705 page 549).
	• *For all sample types, the nature, quality and appropriateness of the sample preparation technique.*	Documented sample preparation techniques followed best practice of the time and are considered adequate.
	• *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.*	No additional historical information is available on quality control procedures to that detailed above.
	• *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.*	Techniques followed best practice of the time including regular cleaning of the cyclones and splitters and careful flushing of holes when water encountered. Comparison of results of twinned holes indicates sampling is representative.
	• *Whether sample sizes are appropriate to the grain size of the material being sampled.*	Sample sizes are considered appropriate.
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.*	Assaying was carried out at certified analytical laboratories and the techniques are considered appropriate, although little historical information is available on checks and standards. Mines Exploration KP holes and Northland's K series were analysed by Amdel Analytical Services (Amdel) for copper using their F1 scheme, an A.A.S. method. Amdel claimed a +/-5% accuracy. KD series drillholes were assayed by Labtech Pty. Ltd. - 101B for copper using a hot, long perchloric acid digestion, AAS determination. No information is available on checks and standards. Utah's KP series rotary percussion drillholes were analysed at Labtech Pty Ltd. Midland W.A. using a hot long perchloric acid digestion with AAS determination for copper No information is available on checks and standards.
	• *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.*	Geophysical tools, spectrometers, handheld XRF instruments, etc. were not available to earlier companies. Terramin utilised hand held XRF analyses to validate copper assays from selected percussion holes stored at the South Australian Drill Core Reference Library and as an aid to geological interpretation. No geophysical tools were used by Terramin to estimate published mineral or element percentages.
	• *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.*	Minimal historical information is available on the use of standards, blanks or duplicates. The use of check analyses were documented by Northland. Check analyses were undertaken at their main laboratory, Amdel and cross lab checks done at Robertson Research and McPhar Geophysics.

Criteria	JORC Code explanation	Commentary
		Original assay reports from Amdel show that at the time they ran a mix of standards and blanks every fifteenth sample, although the results of these internal lab checks were not documented.
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.*	Utah's KD005 which returned from 45m, 27m @ 1.18% copper was resampled by Copper Range in 2007. Copper Range's resampling returned from 45m, 27m @ 1.20% copper. Utah's deep intercept of primary copper sulphide in KD011 returned from 426m, 11m @ 2.00% copper was resampled by Terramin returned from 426m, 11m @ 1.89% copper and 0.1g/t gold. Terramin's samples were a quarter cut of the remaining half core sample. (TZN ASX announcement – 1st Quarter Report, 29/4/2016) Other significant intersections from drill core have been visually reviewed by Terramin and ECR staff. Terramin has also utilised a hand held XRF to validate copper assays of percussion holes stored at the South Australian Drill Core Reference Library.
	• *The use of twinned holes.*	There were two sets of planned twin holes: KD001 twinned drillhole K015 and KD0019 twinned drillholes KP046 and K076. There are a further 6 pairs of drillholes that are close enough to be considered twins. As part of compiling data for the Kapunda Mineral Resource estimate it was deemed necessary to be comfortable with the wide variety of drilling and sampling methods used on the Kapunda Project over a number of years. In order to look at the issue it was decided to; • Compare summary statistics for the different drillhole series. • Compare a selection of twined holes. • Compare poor recovery core holes with good recovery drillholes • Compare rotary drilling with diamond drilling within a specific, geologically constrained spatial area. • The process entailed creating a 2m downhole composite set of drill assays and splitting these into their component drill series types for statistical analysis. Results; • The results in general show no significant bias due to drilling type. • Twin holes Q-Q plots indicate there is little bias. • There appears to be very little difference between holes with poor core recovery versus those with good core recovery. • While there are some individual difference between rotary and diamond holes, looking at a larger sample they appear to give relatively consistent results.
	• *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.*	Primary data was recorded on paper log sheets, photocopies of originals were submitted as part of statutory reporting. These have subsequently been scanned to PDF and made available online at South Australian Resources and Information Gateway (SARIG)in the Resource and Energy Georeference Database. Terramin was also able to obtain digital data sets of the drill data from Copper Range Ltd and the digital data set used by Stuart Metals NL (Stuart Metals) for their 1992 Kapunda Resource estimate. Where differences were found between the data contained in the original company reports and the data provided by Stuart Metals database, the original companies' values were used. The data was entered into Excel spreadsheets before being imported into a Maxwell Geo Services' DataShed and QAQCR which

Criteria	JORC Code explanation	Commentary
		was used to validate the data viz; overlapping intervals, excessive drillhole deviation, assay QAQC. Secondary validation by Maptek's Vulcan software and visual validation was also undertaken.
	• *Discuss any adjustment to assay data.*	No adjustments are made to reported summary intersections. The Mineral Resource estimate makes an allowance for core loss with lost intervals assumed to have a zero grade.
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.*	Mines Exploration established the original grid baseline parallel to main strike of mineralization with grid north at 335 degrees magnetic. All subsequent companies, except for Copper Range used this grid. Initial survey control was by licensed surveyor using theodolite. Collars were fixed by theodolite surveys and metal pin bench marks. Coordinate position 1000N 00E (collar of drillhole KV002). The majority of drill collar locations were recorded in company reports and in Stuart Metals digital database. A few remaining drillhole collar locations were obtained from georeferenced maps. Originally drillhole collar RL's were calculated relative to drillhole KV002 but Northland in 1972 had the site resurveyed relative to the State Datum. To allow for the incorporation of drillhole data from Copper Range an affine transformation was used to convert the earlier drillhole coordinates to MGA Zone 54 (GDA 94).
	• *Specification of the grid system used.*	The data is reported in grid system MGA Zone 54 (GDA94).
	• *Quality and adequacy of topographic control.*	In 1972 Northland Minerals contracted surveying consultants Alex & Symonds Pty Ltd to survey the site and locate drill collars. The level datum used throughout the grid and drillhole levelling is based upon a Lands Department Bench Mark Number 6921. A digital terrain model was created by Terramin from the survey's 528 survey points collected across the deposit. Drillhole collar RL's not picked up during this survey were then assigned a value from this surface. With the exception of the historic workings, the area has low relief. The site has a gentle slope to the south, over the 1,500m of strike length there is just a maximum difference of 25m in collar RLs.
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.*	Drillhole spacings and sample interval lengths are considered appropriate.
	• *Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.*	The data spacing and the characteristics of the Kapunda mineralisation determined from reviewing historical drilling results, and visual inspections of the core are suitable for the defined Mineral Resource to be classified as Inferred for ISR. However, the protocol for estimation and reporting of Mineral Resources for exploitation using ISR has a number of additional steps compared to conventional mining and processing. Before any portion of the Kapunda Mineral Resource can be classified as Indicated or Measured pump testing and hydrogeological modeling will be required.
	• *Whether sample compositing has been applied.*	Field sample compositing was not undertaken on any of the diamond or percussion drill samples. Sample sizes are considered appropriate.
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 orientation of the drilling is considered to be appropriate for the oxide copper and secondary copper sulphide mineralisation.
	• *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*	Drilling orientation is not deemed to have introduced any significant sampling bias.

Criteria	JORC Code explanation	Commentary
	reported if material.	
Sample security	• *The measures taken to ensure sample security.*	Chain of custody management was not documented.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	Prior to acquiring the Kapunda Project from Maximus Resources Ltd (Maximus), Terramin audited the Stuart Metals database against original reports and viewed drill core at the South Australian Drill Core Reference Library. Historical density techniques were considered inappropriate and discarded. New measurements collected by TZN and ERC show that density had previously been overcalled by over 10%. All data was loaded into a DataShed database and validated. Mineralisation was then visually checked and modelled using Maptek's Vulcan. Re-assaying of drill core by Copper Range and Terramin has confirmed the veracity of original sampling techniques and results. External audits and review of modelling techniques and data has been undertaken by Leon Faulkner from ECR.

Section 2: Reporting for 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 Kapunda Mineral Resource is located approximately 90 km north of Adelaide and sits within exploration license (EL) 5262 held by Terramin Exploration Pty Ltd (Terramin Exploration). EL 5262 is currently in good standing and owned 100% by Terramin Exploration. In August 2017 Terramin Exploration entered a joint venture agreement with ECR (TZN ASX announcement – New Copper Joint Venture Development, 2/8/2017) who will investigate the potential to extract the copper through low cost in-situ recovery (ISR) from shallow oxide ores in and around the historic Kapunda Mine area. The majority of the Mineral Resource sits beneath the heritage listed Kapunda Mine historic site which is owned by Light Regional Council. The southern extent of the Mineral Resource sits beneath freehold farmland. With the Kapunda Mine historic site heritage listed and the encroachment of housing within a few hundred metres of the site there is no likelihood of extracting copper by traditional open cut or underground mining techniques. ISR is seen as the only potential method that could be permitted to extract copper. The site consists of an unrehabiliated historic mining site covered by numerous old workings including open cut pits, shafts and waste dumps. There are also remnants of Australia's first heap leach trials which were undertaken in the 1950's. Vegetation regrowth has been minimal because of the high copper content of the soils and a large portion of the historic workings fenced off for the safety of the general public.
	• *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.*	EL 5262 is currently in good standing. The majority of the project area falls within the Kapunda Mine historic site which is owned by the Light Regional Council and as such the land is classified as exempt land under the South Australian Mining Act 1971. This will require a waiver of exemption to be signed before any exploration or mining activities can take place. Clearance from the Department of Environment, Water and Natural Resources (DEWNR) will be required before activities can be conducted within the Heritage Site. Proximity to the Kapunda township means that significant community engagement will need to be carried out before preliminary testing or mining operations can be conducted.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	Since the cessation of mining, Kapunda has been explored by several different government agencies and exploration companies including; SA Dept of Mines (1961-64) Mines Exploration (Broken Hill South) (1964-69) Minefields Exploration (1970) Noranda (1970) Northern Minerals Syndicate (1970-72) Northland Minerals (1971-85) (including Utah Development Co. (1974-78) Aztec Minerals Ltd (1987-88) Shell company (1995) Stuart Metals (1995-99) Minefinders Pty Ltd (1999-2000) Flinders Mines Ltd (2003-08) Copper Range (2007 – 09) Maximus (2008-2013) Terramin (2013-present)

Criteria	JORC Code explanation	Commentary
		Work carried out by these groups has included geophysics, mapping, rock chip sampling, trenching, percussion and diamond drilling. Metallurgical and economic studies on the feasibility of restarting the Kapunda mine have been undertaken on at least 2 occasions. The largest phases of exploration occurred during the mid-1960's through to the mid 1970's with several groups undertaking detailed drilling programs. A brief summary of the larger drilling programs is provided below. Detail is available in the open file envelopes on the South Australian government's SARIG website. Mines Exploration Pty. Ltd. 3 Diamond holes 45 Percussion holes Noranda Australia Ltd. 56 percussion holes Northland Minerals Ltd. 53 diamond holes 369 Auger holes (not used in the Mineral Resource estimate) 11 percussion holes Utah Development Co. 18 diamond core holes 66 non-core holes Copper Range 4 RC holes 1 Diamond core hole
Geology	• *Deposit type, geological setting and style of mineralisation.*	The Kapunda Mineral Resource is located in the Tindelpina Shale Member of the Tapley Hill Formation. It is a structurally controlled copper deposit with the orebody sitting on the western limb of an antiform with primary copper mineralisation consisting of an en echelon series of lodes striking at ~020 degrees magnetic and dipping ~70 degrees west. Secondary supergene enrichment has taken place leading to the development of a significant copper enriched zone with kaolinized metasediments. Mineral species targeted by this Kapunda Mineral Resource include copper oxides (azurite, malachite and cuprite) and secondary copper sulphide minerals (chalcocite and covellite) within 100m of surface.
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*	No new drillhole data or other exploration results are reported. All information has been compiled from "open file envelopes" available for download through the South Australian Government's SARIG website- http://minerals.statedevelopment.sa.gov.au/

Criteria	JORC Code explanation	Commentary
	• *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.*	
	• *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.*	No new exploration results have been reported, all information is publically available from SARIG.
Data aggregation methods	• *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg 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.*	No new exploration results have been reported, all information is publically available from SARIG.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No metal equivalents are reported.
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 (eg 'down hole length, true width not known').*	No new exploration results have been reported, all information is publically available from SARIG.
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.*	Figures 2 and 3 in main 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.*	No new exploration results have been reported, all information is publically available from SARIG.

Criteria	JORC Code explanation	Commentary
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.*	The overall copper grade of the Mineral Resource estimate fits within the accepted parameters for copper ISR operations. Initial hydrogeological investigations show that the en echelon and conjugate fracture systems provide transmissivity values within the range needed for successful ISR operations. The copper mineral species targeted are considered to be potentially recoverable by ISR but laboratory testing needed to confirm this. The majority of the Mineral Resource sits below the current water table. Laboratory testing of samples with different lixiviant systems is required to assess the recoverability of the ore and determine the mineral species that will exist in the pregnant solutions.
Further work	*The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).*	Following approvals from the Light Regional Council and regulators, a groundwater sample from the mineralized lode system will be collected and be used in the laboratory testing of lixiviant systems on core samples to be undertaken by CSIRO. Further hydrogeological investigations including aquifer pump testing and beneficial use studies will be undertaken. Understanding the hydrogeology of the area is critical to the Kapunda Project. Consequently, detailed hydrogeological investigations will be undertaken to accurately model groundwater parameters. These models will allow ECR to undertake design work to ensure that there is no compromising existing users' water quality or ability to access water. Groundwater Science has been engaged by ECR to carry out further groundwater studies.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	Additional drilling is required to better define and potentially extend the southern limits of the Kapunda mineralisation, Figure 2.

Section 3: Estimation and Reporting of Mineral Resources

Criteria	JORC Code explanation	Commentary
Database integrity	*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.*	The 2018 Kapunda Mineral Resource estimate is based on drilling largely undertaken during the 1960's and 1970's and minor drilling undertaken in 2008. Data for the Mineral Resource estimate came from scanned copies of reports that cover all drilling periods available on "South Australian Resources Information Gateway" (SARIG). Terramin was also able to obtain digital data sets of the drill data from Copper Range Ltd and the digital data set used by Stuart Metals NL for their 1992 Resource Estimate.
	Data validation procedures used.	Drillhole data was extracted from the original reports by Terramin and crossed checked with the digital datasets from Stuart Metals and Copper Range. Where differences were found between the data contained in the original company reports and the provided Stuart Metals database, the original companies' values were used. The data was then imported into a Maxwell Geo Services' DataShed and QAQCR were used to validate the data viz; overlapping intervals, excessive drillhole deviation, assay QAQC. Secondary validation by Maptek's Vulcan software and visual validation.
Site visits	*Comment on any site visits undertaken by the Competent Person and the outcome of those visits.*	The Competent Person has undertaken several site visits to the Kapunda project. These visits have verified that the dimensions of the physical site correspond with dimensions implied by the data sets. Copper oxide in the form of malachite is present in the mullock piles and copper efflorescence visible on many of the historic pit faces. Evidence of previous mining operations is visible with numerous open cuts, shafts and waste dumps still clearly visible. Visits have also been undertaken at the South Australian Drill Core Reference Library where over 100 Kapunda drillholes are stored.
	If no site visits have been undertaken indicate why this is the case.	Site visits have been undertaken.
Geological interpretation	*Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.*	The extensive surface and underground mining of the Kapunda lodes combined with the large amount of diamond drilling history of the Kapunda projects implies confidence in the current geological interpretation There are no alternative geological models of the secondary copper mineralisation (copper oxides and secondary copper sulphides). The vertical extent of secondary copper mineralisation modelled by Terramin using drillhole data is broadly comparable to the line "approximate lower limit of secondary enrichment" mapped out on a longitudinal section produced by the South Australian Mines Department in 1942 (Plan N2788).
	Nature of the data used and of any assumptions made.	The 2018 Kapunda Resource utilized data from 78 diamond and 109 percussion holes with a combined meterage of 22,712.8m. Original lab assays were used. Resampling and lab analysis of selected diamond core intervals and xrf analysis of drill chips from percussion holes stored at the South Australian Drill Core Reference Library by both Copper Range Pty and Terramin confirmed the appropriateness and accuracy of historic assay methods. All original density measurements were considered inappropriate as they did not make allowances for porosity of the rock. ECR and Terramin collected 202 new density measurements from 19 drillholes using a modified Archimedes method. Historically the assumed density was between 2.0 t/m^3 (ACC and Stuart Minerals) and 2.4 t/m^3 (BHS and Northland) whereas the average calculated density of the 2018 Mineral Resource estimate is only 1.84 t/m^3.

Criteria	JORC Code explanation	Commentary
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	No alternative interpretations for the secondary copper enrichment have been put forward for serious consideration. Alternative geological interpretations may be developed with further drilling but in the Competent Person's opinion they would not significantly affect the global resource estimate, but could affect local estimates.
	The use of geology in guiding and controlling Mineral Resource estimation.	The 2018 Mineral Resource estimate was focused on defining the extent and nature of secondary (oxide/supergene) copper mineralisation. Important boundaries modelled were the top and base of copper oxides, top and base of secondary sulphides and top of primary copper sulphides. The lower limit of (significant) weathering corresponds with the base of secondary copper mineralisation. Detailed geological control has not been attempted at this stage. Primary copper mineralisation was bounded on the east by the Mine Fault, which dips 65°E. The old workings immediately west of this structure occur principally in sets of en echelon lodes comprising of quartz-sulphide filled fractures of which 28 were worked at an average width of 45cm.
	The factors affecting continuity both of grade and geology.	The main controlling features of the secondary copper are seen to be proximity to primary mineralisation, the water table and the partial replacement of pyritic horizons by copper within the supergene zone and depth of weathering.
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.*	The Mineral Resource has a strike length of 1700m, a plan width of 500m and has been limited to a maximum depth of 100m. Copper mineralisation was historically mined from surface and copper efflorescence is visible on many of the pit faces.
Estimation and modelling techniques	*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.*	Wireframes modelled included; top and base of copper oxide mineralisation, top and base of secondary copper sulphides and top of primary copper sulphides. Compositing of drillhole samples was completed at 2m (downhole) intervals, with composites flagged to identify the copper's mineralogy. The 2m composites were used for statistical analysis and continuity modeling. Variogram models for copper were developed using Snowden's Supervisor software. Ordinary kriging estimation technique was used for estimation of copper grade. Estimation of blocks was limited to a maximum of three composites per hole from a maximum of three drillholes. Maximum distance of extrapolation was limited to 100m. There are no "extreme grade values" as all copper grades of the 2m composites were below the average historic production grade of 19% copper. The maximum assay from the oxide and secondary sulphide portions of the Resource estimate were respectively 6.3% and 17.7% copper. All geological modelling, block model construction, grade interpolation and reporting were completed using Maptek's Vulcan software.

Criteria	JORC Code explanation	Commentary
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	Previous Mineral Resource estimates, calculated for mining by open cut are; • BHS (1969) - 5.5Mt @ 0.74% copper for 41,000t of contained metal. • Northland (1978) - 6.3Mt @ 1.50% copper for 94,000t of contained metal. • ACC (1989) - 7.2 Mt @ 0.83% copper for 60,000 tonnes of contained metal • Stuart Metals (1992) - 4.3 Mt @ 1.10% copper for 47,000 tonnes of contained metal. •
	The assumptions made regarding recovery of by-products.	No assumptions made. Potential by-products have not been modelled.
	Estimation of deleterious elements or other non-grade variables of economic significance (eg sulphur for acid mine drainage characterisation).	No deleterious elements have been estimated. For the majority of drillholes only copper was analysed.
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	The parent block size is 25 m E by 25 mN by 5.0 m RL. Sub blocking of 1mE by 1mN by 1mRL was required to honour wireframe boundaries of the historic underground workings. Sub blocks used parent block's grade. Drilling is typically on 50m spaced sections with drillholes on sections variably spaced 10m to 60m.
	Any assumptions behind modelling of selective mining units.	The selective mining unit reflects ISR as the proposed extractive technique.
	Any assumptions about correlation between variables.	No correlation between variables assumptions is made.
	Description of how the geological interpretation was used to control the resource estimates.	Geological logs were used to map out the extents of copper oxides, secondary and primary copper sulphides which were validated against Hylogger results and core inspections undertaken by Terramin. Surfaces generated included; base of copper oxides, top and base of secondary copper sulphides and top of primary copper sulphides.
Estimation and modelling techniques (continued)	*Discussion of basis for using or not using grade cutting or capping.*	No top cuts were applied. This was considered appropriate as all copper grades of the 2m composites were below the average historic production grade of 19% copper. The maximum assay from the oxide and secondary sulphide portions of the Resource were respectively 6.3% and 17.7% copper.
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	Various visual and statistical checks were undertaken to validate modelling and grade interpolation. The global results are comparable with the reported OK models with localised differences as expected.
Moisture	*Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	The Mineral Resource estimate is based upon dry tonnages. Moisture content has not been included.
Cut-off parameters	*The basis of the adopted cut-off grade(s) or quality parameters applied.*	A cut-off of 0.05% total copper for oxide and transitional is industry standard for ISR of copper projects. Both Excelsior Mining Corp and Cirus Resources Ltd both use a resource cut-off of 0.05% copper in their economic studies for their respective Gunnison Copper Project and Florence Copper Project located in Arizona, USA.

Criteria	JORC Code explanation	Commentary
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 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.*	The proposed use of the ISR method to extract copper from oxide and secondary sulphide copper mineralization was chosen based on several criteria including: the majority of the ore body sitting below the water table; the fractured nature of the host rock providing transmissivity for fluids through the preferentially mineralized fracture systems; the potential amenability of the mineral species to the leaching and recovery process; the relatively low visual and environmental impact of the ISR method (no bulk movement of rock, no open cut pits or waste dumps, little noise or dust pollution) given the proximity of the orebody to the local population.
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.*	While historic work has shown the mineral species to be targeted are amenable to leaching by a number of lixiviant systems, detailed metallurgical test work has not been completed at this stage.
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.*	ISR allows the extraction of minerals with little physical disturbance to the environment. Since there is no physical movement of rock, there are no open cut pits, shafts or dumps to manage on surface. ISR is a closed loop system that generates much smaller volumes of mining and hydrometallurgical effluents that require management than conventional operations. While little current environmental work has been carried out on the project to date, it is assumed that waste will be minimal and will be disposed of at an EPA licenced facility.
Bulk density	*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.*	Historic density measurements were considered inappropriate as they did not make allowances for porosity of the rock. ECR and Terramin collected 202 new density measurements from 19 drillholes using a modified Archimedes method. Previous Resource estimates used an averaged density. was between and BHS and Northland used a density of 2.4 t/m^3 and ACC and Stuart Minerals 2.0 t/m^3. While the average interpolated density for the 2018 Mineral Resource estimate is 1.84 t/m^3.

Criteria	JORC Code explanation	Commentary
	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.	The modified Archimedes method is considered an appropriate method as it allows for water absorption, there was no slaking of the samples and no vugs were present.
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	Bulk density was modelled using the same domains and search parameters used for the copper mineralisation. There is slight negative correlation with copper grade, presumed due to increased kaolinization of the metasediments..
Classification	*The basis for the classification of the Mineral Resources into varying confidence categories.*	The whole Kapunda Mineral Resource has been classified as Inferred. It is the view of the Competent Person that additional hydrological studies and leaching tests are required before any portion of the Mineral Resource can be classified at a higher confidence category than Inferred.
	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).	Historic data input is well documented and considered reliable. Within the Resource the distribution of data and continuity is good.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The result appropriately reflects the Competent Person's view of the deposit.
Audits or reviews	*The results of any audits or reviews of Mineral Resource estimates.*	The 2018 Mineral Resource Estimate has been reviewed Terramin Australia.
Discussion of relative accuracy/ confidence	*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.*	This Kapunda Mineral Resource estimate relates to copper oxide and secondary copper sulphide mineralisation within 100m of surface. The Mineral Resource estimate is considered robust and representative. This model is intended only for use in aiding scoping study investigations into the use if ISR. The Mineral Resource estimate has been classified in accordance with the JORC Code, 2012 Edition using a qualitative approach. All factors that have been considered have been sufficiently documented in Section 1 and Section 3 of this Table.
	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.	The Kapunda Mineral Resource estimate relates to the copper oxide and secondary copper sulphide mineralisation where it is likely to have local variability. The global assessment is more of a reflection of the average tonnes and grade estimate.

Criteria	JORC Code explanation	Commentary
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	Historic production data is not relevant for the proposed ISR extraction method as the ISR method will target the low grade halo to the historically mined mineralisation. Mining of the high grade supergene from 1844 to 1866, largely from underground produced 13,500t of copper from 68,000t of ore at an average grade of 19.8% copper. From 1867 to 1878 approximately 300,000t of tailings, waste rock and low grade copper mineralisation mined from open cuts were leached to produce 1,600t of copper at an average grade of 0.5%.

Hole	East	North	RL	Max Depth	Azimuth	Dip	Company
KP001_1965	308474	6197245	225.9	311.28	65	-45	Mines Exploration Pty Ltd
KP002_1965	308439	6196594	216.8	400.43	63	-45	Mines Exploration Pty Ltd
KP003_1965	310226	6196978	241	243.08	247	-50	Mines Exploration Pty Ltd
KV001	308432	6197229	226.2	91.44	0	-90	Mines Exploration Pty Ltd
KV002	308395	6197218	225.7	91.44	0	-90	Mines Exploration Pty Ltd
KV003	308424	6197227	226.2	91.44	0	-90	Mines Exploration Pty Ltd
KV004	308461	6197530	235	91.44	0	-90	Mines Exploration Pty Ltd
KV005	308483	6197246	225.7	91.44	0	-90	Mines Exploration Pty Ltd
KV006	308516	6197256	225.5	91.44	0	-90	Mines Exploration Pty Ltd
KV007	308541	6197263	227.2	63.09	0	-90	Mines Exploration Pty Ltd
KV008	308570	6197273	229.5	54.86	0	-90	Mines Exploration Pty Ltd
KV009	308600	6197282	229.5	51.82	0	-90	Mines Exploration Pty Ltd
KV010	308629	6197291	229.4	49.07	0	-90	Mines Exploration Pty Ltd
KV011	308659	6197300	229.3	48.77	0	-90	Mines Exploration Pty Ltd
KV012	308690	6197309	229.3	33.53	0	-90	Mines Exploration Pty Ltd
KV013	308438	6197510	232.5	51.82	0	-90	Mines Exploration Pty Ltd
KV014	308453	6197236	226.2	42.67	0	-90	Mines Exploration Pty Ltd
KV015	308392	6197470	232.8	91.44	0	-90	Mines Exploration Pty Ltd
KV016	308334	6197419	233.3	91.44	0	-90	Mines Exploration Pty Ltd
KV017	308357	6197440	233.3	35.05	0	-90	Mines Exploration Pty Ltd
KV018	308380	6197460	232.9	91.44	0	-90	Mines Exploration Pty Ltd
KV019	308405	6197479	233.6	91.44	0	-90	Mines Exploration Pty Ltd
KV020	308425	6197501	230.1	57.91	0	-90	Mines Exploration Pty Ltd
KV021	308451	6197519	233.8	68.58	0	-90	Mines Exploration Pty Ltd
KV022	308474	6197539	235.7	38.1	0	-90	Mines Exploration Pty Ltd
KV023	308500	6197565	238.5	76.2	0	-90	Mines Exploration Pty Ltd
KV025	308585	6197277	229.6	24.99	0	-90	Mines Exploration Pty Ltd
KV026	308556	6197269	228.5	51.82	0	-90	Mines Exploration Pty Ltd
KV027	308527	6197259	226.2	91.44	0	-90	Mines Exploration Pty Ltd
KV028	308497	6197250	225.5	91.44	0	-90	Mines Exploration Pty Ltd
KV029	308468	6197241	226	91.44	0	-90	Mines Exploration Pty Ltd
KV030	308527	6197100	222	91.44	0	-90	Mines Exploration Pty Ltd
KV031	308558	6197109	222.5	91.44	0	-90	Mines Exploration Pty Ltd
KV032	308582	6197119	222.3	91.44	0	-90	Mines Exploration Pty Ltd
KV033	308616	6197127	222.4	91.44	0	-90	Mines Exploration Pty Ltd
KV034	308647	6197137	222.4	70.1	0	-90	Mines Exploration Pty Ltd
KV035	308676	6197145	223.1	91.44	0	-90	Mines Exploration Pty Ltd
KV036	308705	6197154	223.2	89	0	-90	Mines Exploration Pty Ltd
KV038	308545	6196948	219.3	91.44	0	-90	Mines Exploration Pty Ltd
KV039	308577	6196958	219	91.44	0	-90	Mines Exploration Pty Ltd
KV040	308603	6196966	219.2	91.44	0	-90	Mines Exploration Pty Ltd
KV041	308632	6196975	218.9	91.44	0	-90	Mines Exploration Pty Ltd
KV042	308661	6196984	218.4	91.44	0	-90	Mines Exploration Pty Ltd

Hole	East	North	RL	Max Depth	Azimuth	Dip	Company
KV043	308693	6196994	218.8	79.25	0	-90	Mines Exploration Pty Ltd
KV044	308738	6197164	224	64.01	0	-90	Mines Exploration Pty Ltd
KV045	308720	6197002	219.2	67.06	0	-90	Mines Exploration Pty Ltd
M001	308663	6196962	217.9	32	0	-90	Noranda Australia Ltd
M002	308679	6196960	218.1	24.38	0	-90	Noranda Australia Ltd
M003	308644	6196962	218.4	11.58	0	-90	Noranda Australia Ltd
M004	308715	6196672	213.8	40.23	0	-90	Noranda Australia Ltd
M005	309960	6196934	261	57.91	0	-90	Noranda Australia Ltd
M006	310020	6196953	250	45.72	251	-65	Noranda Australia Ltd
M007	310078	6196978	244	45.72	250	-62	Noranda Australia Ltd
M008	310078	6196978	244	45.72	230	-59	Noranda Australia Ltd
M009	309975	6197098	253	45.72	230	-59	Noranda Australia Ltd
M010	310035	6197121	247	27.43	240	-60	Noranda Australia Ltd
M011	308682	6196666	213.9	34.75	0	-90	Noranda Australia Ltd
M011A	308682	6196665	213.8	60.35	0	-90	Noranda Australia Ltd
M012	308651	6196660	213.8	53.95	0	-90	Noranda Australia Ltd
M013	308621	6196655	214	42.67	0	-90	Noranda Australia Ltd
M014	308591	6196654	214.2	42.67	0	-90	Noranda Australia Ltd
M015	308592	6196484	213.7	39.62	0	-90	Noranda Australia Ltd
M016	308561	6196474	214.3	39.62	0	-90	Noranda Australia Ltd
M019	308714	6196901	217.7	41.15	0	-90	Noranda Australia Ltd
M020	308663	6196872	216.9	41.76	0	-90	Noranda Australia Ltd
M021	308700	6196882	217.2	45.72	0	-90	Noranda Australia Ltd
M022	308696	6197080	221.1	21.34	0	-90	Noranda Australia Ltd
M023	308723	6197113	222.3	39.62	0	-90	Noranda Australia Ltd
M025	308793	6197026	220.5	39.62	0	-90	Noranda Australia Ltd
M027	308577	6196316	217	30.48	0	-90	Noranda Australia Ltd
Z011	310087	6197141	242	24.38	0	-90	Noranda Australia Ltd
K001	308536	6197389	231.7	76.2	0	-90	Northland Minerals Ltd
K003A	308562	6197399	234.1	100.58	0	-90	Northland Minerals Ltd
K004	308509	6197389	220.6	93.88	0	-90	Northland Minerals Ltd
K005	308468	6197370	229.5	69.49	0	-90	Northland Minerals Ltd
K006	308591	6197408	235.3	75.5	0	-90	Northland Minerals Ltd
K007	308413	6197354	230	76.2	0	-90	Northland Minerals Ltd
K008	308483	6197374	220.6	128.32	0	-90	Northland Minerals Ltd
K009	308691	6196806	221.4	74.9	0	-90	Northland Minerals Ltd
K010	308603	6196781	218.1	91.75	0	-90	Northland Minerals Ltd
K011	308514	6197384	220.5	42.6	245	-65	Northland Minerals Ltd
K012	308417	6197355	230	120.7	64	-65	Northland Minerals Ltd
K013	308355	6197337	229.7	161.5	64	-65	Northland Minerals Ltd
K014	308385	6197346	229.9	74.98	0	-90	Northland Minerals Ltd
K015	308328	6197327	229.7	128.02	65	-65	Northland Minerals Ltd
K016	308452	6197434	229.6	92.66	65	-65	Northland Minerals Ltd

Hole	East	North	RL	Max Depth	Azimuth	Dip	Company
K017	308551	6197332	230.1	72.54	64	-65	Northland Minerals Ltd
K018	308419	6197546	235.1	121.92	64	-65	Northland Minerals Ltd
K019	308493	6197314	227.5	89.9	64	-65	Northland Minerals Ltd
K020	308398	6197412	231	107.29	64	-65	Northland Minerals Ltd
K021	308196	6197683	250.9	91.44	64	-65	Northland Minerals Ltd
K022	308302	6197511	239.4	33.83	0	-90	Northland Minerals Ltd
K023	308435	6197296	227.9	122.83	65	-64	Northland Minerals Ltd
K024	308643	6197041	220.4	83.21	64	-65	Northland Minerals Ltd
K025	308453	6197238	226.2	135.33	0	-90	Northland Minerals Ltd
K026	308339	6197394	232	128.02	64	-65	Northland Minerals Ltd
K027	308585	6197024	220.1	106.38	64	-65	Northland Minerals Ltd
K028	308130	6197649	244.7	136.55	64	-65	Northland Minerals Ltd
K029	308299	6197319	229.2	137.54	65	-65	Northland Minerals Ltd
K030	308376	6197279	228	151.49	65	-65	Northland Minerals Ltd
K031	308355	6197527	228.8	140.21	64	-65	Northland Minerals Ltd
K032	308478	6197564	237	90.53	64	-65	Northland Minerals Ltd
K033	308403	6197599	238	107.24	64	-65	Northland Minerals Ltd
K034	308304	6197505	239	128.02	64	-65	Northland Minerals Ltd
K035	308243	6197292	229.2	161.5	64	-65	Northland Minerals Ltd
K036	308281	6197376	232.1	127.71	63	-65	Northland Minerals Ltd
K037	308540	6196743	226	110.03	64	-65	Northland Minerals Ltd
K038	308317	6197260	227.4	137.16	64	-65	Northland Minerals Ltd
K039	308484	6196736	226	106.68	64	-65	Northland Minerals Ltd
K040	308563	6196889	219.3	156.97	65	-65	Northland Minerals Ltd
K041	308530	6197198	224.9	91.44	64	-65	Northland Minerals Ltd
K042	308471	6197180	224.2	14.63	64	-65	Northland Minerals Ltd
K043	308332	6197648	246.4	106.68	64	-65	Northland Minerals Ltd
K044	308617	6197225	227.4	106.68	64	-65	Northland Minerals Ltd
K045	308413	6197162	222.7	124.36	64	-65	Northland Minerals Ltd
K046	308505	6196872	222.9	106.38	64	-65	Northland Minerals Ltd
K047	308207	6197609	248	121.92	65	-65	Northland Minerals Ltd
K048	308459	6197049	223.2	136.25	65	-65	Northland Minerals Ltd
K049	308297	6197126	231.2	122.2	65	-65	Northland Minerals Ltd
K050	308332	6197010	237.4	118.87	65	-65	Northland Minerals Ltd
K051	308280	6197568	244	137.16	65	-50	Northland Minerals Ltd
K052	308376	6197475	230.9	149.35	65	-65	Northland Minerals Ltd
K053	308624	6197102	221.9	88.54	65	-50	Northland Minerals Ltd
KD001	308280	6197300	228.8	150	65	-65	Utah Development Co
KD002	308432	6197279	227.6	25.2	65	-65	Utah Development Co
KD003	308490	6197317	227.5	75.8	65	-65	Utah Development Co
KD004	308395	6197318	229.1	153	65	-65	Utah Development Co
KD005	308338	6197396	232.1	176.6	65	-65	Utah Development Co
KD006	308001	6197217	233	601.4	65	-65	Utah Development Co

Hole	East	North	RL	Max Depth	Azimuth	Dip	Company
KD007	308673	6197438	237	449.2	245	-85	Utah Development Co
KD008	308897	6197732	247	481.9	245	-60	Utah Development Co
KD009	308798	6197486	237.4	313.9	0	-90	Utah Development Co
KD010	308828	6197859	250.63	388.3	330	-80	Utah Development Co
KD011	308993	6197625	240.76	520.5	235	-60	Utah Development Co
KD012	308688	6197502	238.9	524.9	0	-90	Utah Development Co
KD013	308319	6197356	230.9	245.2	65	-65	Utah Development Co
KD015	308304	6197764	249.3	299.5	0	-90	Utah Development Co
KD016	308972	6197402	232.84	487.4	245	-80	Utah Development Co
KD017	308438	6197850	243.7	288.2	65	-85	Utah Development Co
KD020	308483	6197364	222.4	83.5	65	-60	Utah Development Co
KD022	309027	6197528	237.38	249.5	265	-80	Utah Development Co
KD023	308635	6197464	238.8	499.2	0	-90	Utah Development Co
KD024	308730	6197389	233.8	539.5	0	-90	Utah Development Co
KD026	307879	6197767	236.18	447.8	65	-60	Utah Development Co
KD027	308671	6197364	236.3	162.6	0	-90	Utah Development Co
KD029	307902	6195909	225.04	591.4	245	-60	Utah Development Co
KP001	308607	6197420	236.2	175.4	0	-90	Utah Development Co
KP002	308653	6197435	236.9	183.1	0	-90	Utah Development Co
KP003	308792	6197478	237.3	196.5	0	-90	Utah Development Co
KP004	308480	6197578	237.7	170.8	0	-90	Utah Development Co
KP007	308462	6197585	237.1	115	0	-90	Utah Development Co
KP008	308775	6197239	226.6	167.6	0	-90	Utah Development Co
KP009	308658	6197200	225.4	182.9	0	-90	Utah Development Co
KP013	308722	6197380	233.5	173.5	0	-90	Utah Development Co
KP014	308618	6197509	240.4	172	0	-90	Utah Development Co
KP015	308673	6197529	240.2	184	0	-90	Utah Development Co
KP016	308615	6197187	223.9	172	0	-90	Utah Development Co
KP017	308349	6197126	228.1	160	65	-85	Utah Development Co
KP025	309317	6197644	245.22	200	0	-90	Utah Development Co
KP027	307579	6195883	232	157	245	-60	Utah Development Co
KP028	307604	6195907	233	150	245	-60	Utah Development Co
KP029	307753	6195963	234	200	245	-60	Utah Development Co
KP030	307823	6195982	235	138	245	-60	Utah Development Co
KP031	309771	6197749	260	200	245	-60	Utah Development Co
KP032	309876	6197778	259	200	252	-60	Utah Development Co
KP033	308002	6197650	247	176	65	-60	Utah Development Co
KP034	308093	6197677	246.1	182	65	-60	Utah Development Co
KP035	308251	6197725	251.7	160	0	-90	Utah Development Co
KP036	308355	6197749	246.7	146	0	-90	Utah Development Co
KP037	308512	6197787	241.4	192	0	-90	Utah Development Co
KP041	308323	6197777	248	178	0	-90	Utah Development Co
KP042	308432	6197782	243.2	200	0	-90	Utah Development Co

Hole	East	North	RL	Max Depth	Azimuth	Dip	Company
KP046	308497	6196666	219.5	162	65	-60	Utah Development Co
KP057	308689	6197315	229.7	168	0	-90	Utah Development Co
KP058	308742	6197333	231.4	196	0	-90	Utah Development Co
KP060	308956	6196433	210.73	131	0	-90	Utah Development Co
KP061	309038	6196456	209.84	124	0	-90	Utah Development Co
KP062	309137	6196485	211.23	110	0	-90	Utah Development Co
KP063	308409	6197626	239.6	152	0	-90	Utah Development Co
KP064	309183	6197866	255.64	200	0	-90	Utah Development Co
KP069	308133	6196548	229.2	176	245	-60	Utah Development Co
KP070	307925	6196480	233.51	136	0	-90	Utah Development Co
SK001	308680	6196337	212.7	82	62	-60	Copper Range Ltd
SK002	308640	6196306	215.1	150	62	-60	Copper Range Ltd
SK003	308635	6196660	214	41	62	-60	Copper Range Ltd
SK004	308613	6196630	213.7	81	62	-60	Copper Range Ltd
SM001	310015	6196862	264	119	0	-90	Copper Range Ltd