ASX Code: "THR"

22 February 2018

THOR MINING PLC

Registered Numbers:
United Kingdom 05276 414
Australia 121 117 673

Registered Office:
58 Galway Avenue
MARLESTON, SA, 5035
Australia

Ph: +61 8 7324 1935
Fx: +61 8 8351 5169

Email:
corporate@thormining.com

Website:
www.thormining.com

Twitter
@ThorMining

Enquiries:
Mick Billing
Executive Chairman
Thor Mining PLC
+61 8 7324 1935

Nominated Advisor
Colin Aaronson
Grant Thornton
+44 (0) 20 7383 5100

AIM & ASX Listings:
Shares: THR

Directors:
Michael Billing
David Thomas
Paul Johnson
Alastair Middleton
Richard Bradey

Key Projects:

- **Tungsten**
  Molyhil NT
  Pilot Mountain USA
- **Copper**
  Kapunda SA

Company Announcements Office
ASX Securities Limited,
20, Bridge Street,
Sydney, N.S.W. 2000

CLARIFICATION

SUBSTANTIAL COPPER RESOURCE – KAPUNDA PROJECT, SOUTH AUSTRALIA

INFERRED ISR COPPER RESOURCE OF 119,000 TONNES CONTAINED COPPER

The Board of Thor Mining Plc ("Thor" or the "Company") (AIM, ASX: THR), is pleased to announce that a substantial Resource estimate containing 119,000 tonnes of copper, considered amenable to In Situ Recovery techniques ("In Situ Recovery" or "ISR"), released 12 February by Environmental Copper Recovery SA Pty Ltd. ("ECR") and Terramin Australia Limited ("Terramin" ASX: "TZN").

Thor, as announced on 1 August 2017, is earning up to a 60% interest in ECR, which in turn is earning, from Terramin, up to a 75% interest in the mineral rights and claims over the portion of the historic Kapunda copper mine in South Australia recoverable by way of in situ recovery techniques. Subject to full earn in Thor would therefore hold an effective 45% interest in Kapunda.

Highlights:

- An Inferred Resource estimate of 47.4 million tonnes (MT) grading 0.25% copper (Cu), containing 119,000 tonnes of contained copper;
- Resource estimate is only for that part of the Kapunda mineralisation dominated by copper species (copper oxides and secondary copper sulphides) that is considered amenable to ISR techniques;
- Estimate reports mineralisation that is within 100 metres of the surface;
- The Resource grade is well within the recommended ranges for In Situ recovery of copper and preliminary investigations of hydro geological parameters appear favourable
- ISR processes are not burdened by the normally high capital and operating cost activities of mining, crushing, grinding, and often flotation associated with conventional mining and processing operations. Subject to feasibility study outcomes at Kapunda, there is therefore an expectation that copper production from shallow deposits, amenable to ISR techniques may be at relatively low cost.
- Further work is required to advance a range of areas prior to commercial development including ongoing local government and community engagement, continuing technical assessment, and various environmental and regulatory issues.

Figure 1: Face of the historic Kapunda Stockyard Pit showing distinctive oxidised copper mineralisation on the face.

Figure 2: View of the wall of the Kapunda Main Pit showing distinctive oxidised copper mineralisation on the face.

Mick Billing, Executive Chairman, commented:

"An Inferred Resource estimate containing 119,000 tonnes of copper is well above expectations and is outstanding news for our investors”.

”Global copper prices have moved upwards strongly over the past 12 months, and we expect this trend to continue. However, at the price at the date of this announcement of approximately US$7,000 per tonne, this Inferred Resource demonstrates that the project has considerable potential value.”

“Thor is uniquely placed with a right to earn into an effective 45% interest in this strategically significant project, just at a time when new copper opportunities are being sought in safe jurisdictions.”

“The advancements in ISR and lixiviant technologies offer new methods to extract copper. The ISR method is considered to be a viable method of extracting the copper in this location with minimal disturbance to the existing surface profile.”

“We are very pleased to have been able to access the Kapunda opportunity at an early stage and are naturally delighted with the Resource findings announced today”.

“To upgrade the Resource estimate from Inferred to Indicated and/or Measured status does not require significant infill drilling, rather successful pump test work and field recovery trials, which will include modest levels of drilling to conduct that work”.

Thor and ECR are committed to ongoing community engagement being fundamental in the development of the Kapunda project, and we will engage widely through review and feedback of our plans and processes as we advance this important project”.

“We look forward to updating investors regularly as news on this project becomes available.”

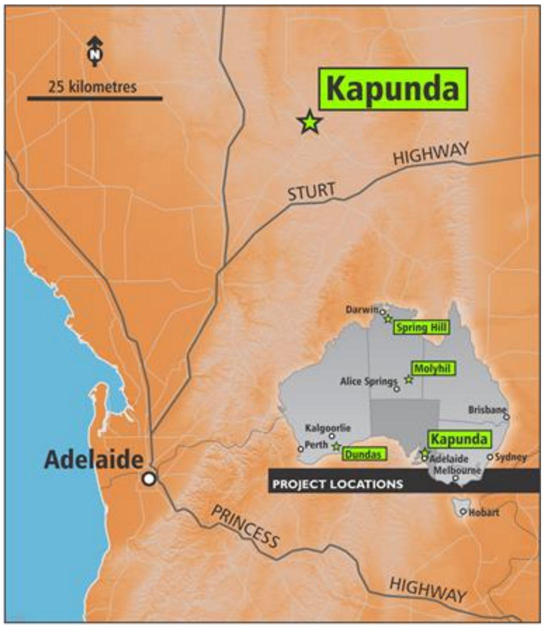

Figure 3. Kapunda Location Map

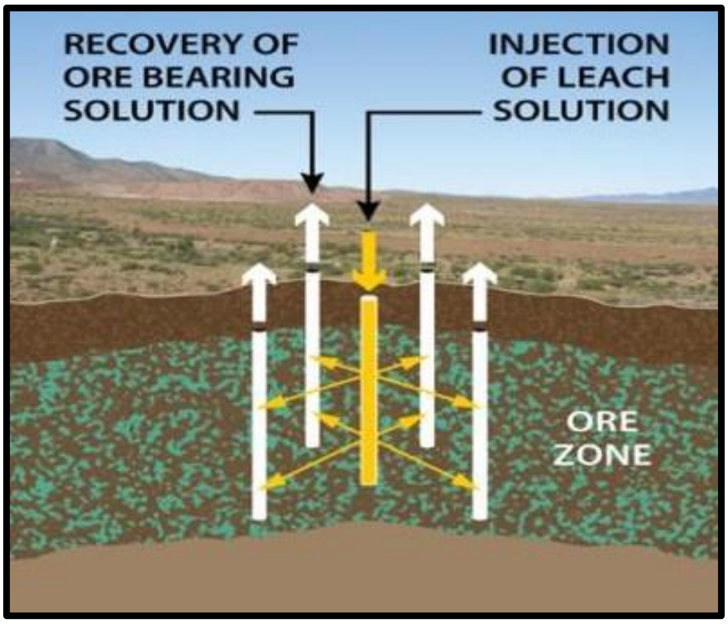

Figure 4. Schematic of Insitu Recovery process

Resource Estimate

Following a review of both historical mining records, historical drilling reports and drill core, ECR and Terramin have prepared an Inferred Resource Estimate for that part of the Kapunda Copper Deposit assessed as being amenable to Insitu Recovery.

Table A: Kapunda copper Resource estimate (JORC 2012)

		Resource	Copper	
		MT	Grade %	Contained metal (t)
Copper Oxide	**Inferred**	30.3	0.24	73,000
Secondary copper sulphide	**Inferred**	17.1	0.27	46,000
	Sub Total	**47.4**	**0.25**	**119,000**

Notes:

- *Figures are rounded to reflect appropriate levels of confidence. Apparent differences may occur due to rounding.*
- *ECR are earning a 75% interest in this resource, and Thor have investment rights for up to 60% of ECR.*
- *Cut off grade used of 0.05% Cu*

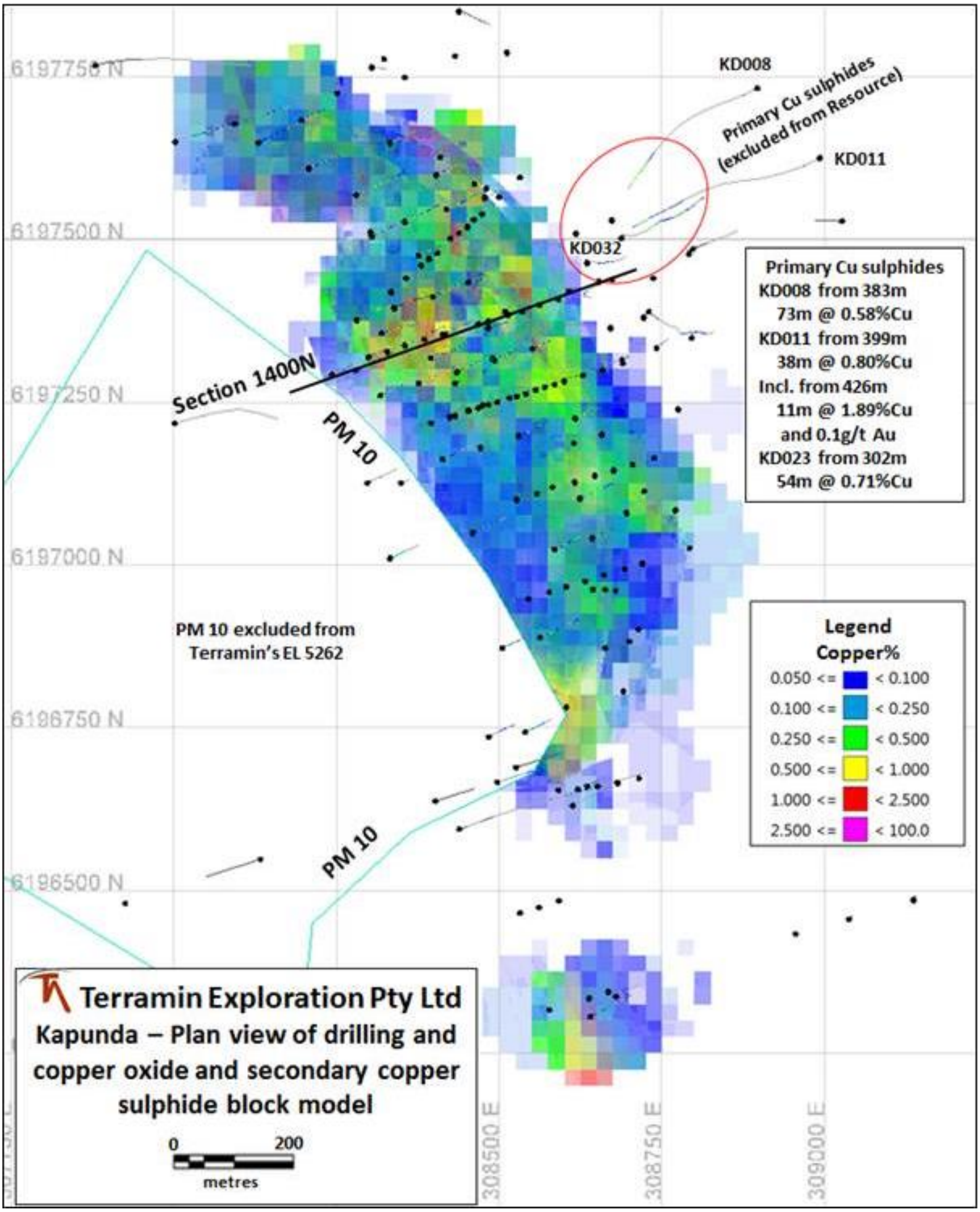

Figure 5. Kapunda plan view showing extent of block model and drillholes.

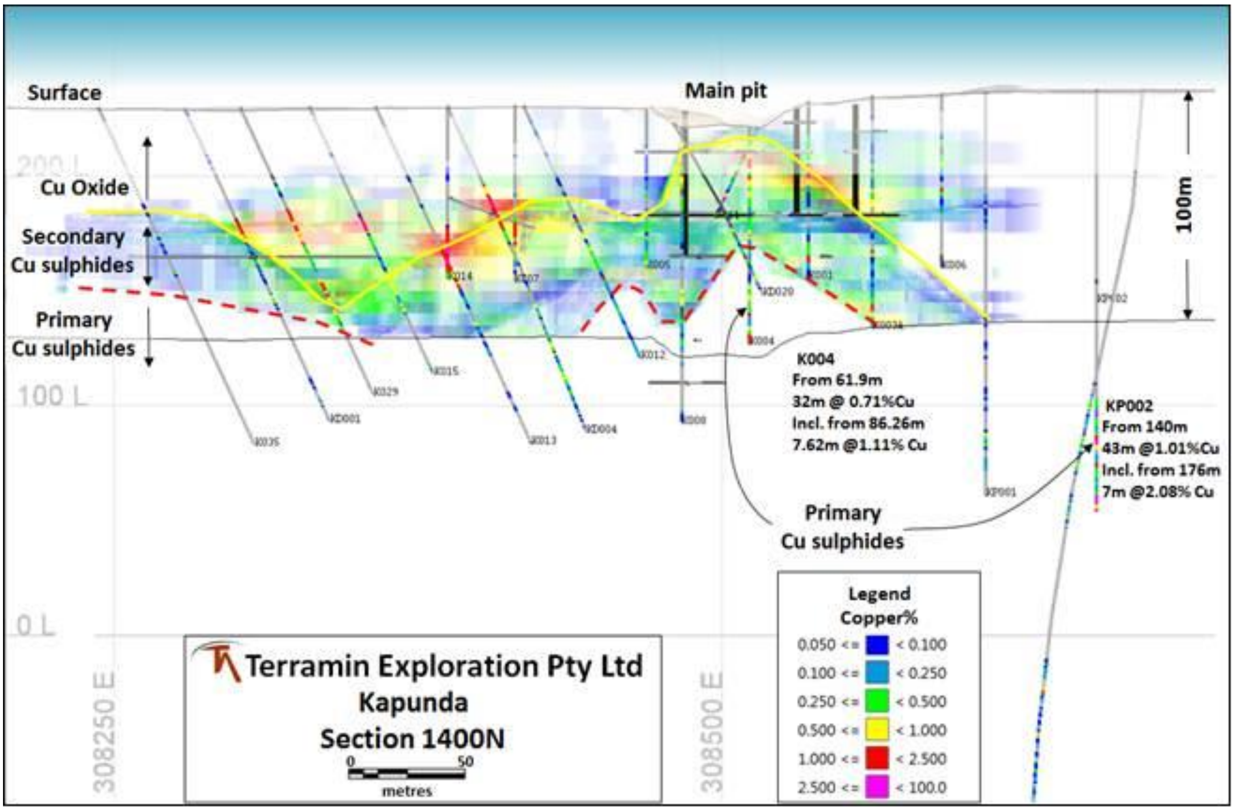

Figure 6. Kapunda cross section 1400N (looking north) showing drillholes and block model coloured by copper grade and historic workings (25m window).

The Resource estimation process involved:

- Evaluation and modelling of historical drilling information;
- Preliminary review of hydrogeologic information, including water levels, bore flow rates and lithology types to estimate likely aquifer transmissivity and possible well yields;
- Detailed examination of structures and grades within the deposit, and the alignment of permeability with the Resource;
- Examination of core samples from historical drilling to assess visually porosity and permeability characteristics for ISR;
- Assessment of the various mineral species horizons to delineate those copper minerals for which the recovery technique is feasible from those less amenable;
- Review and modelling of zones of depletion from historical mining activities.

The following is a summary of the information in appended JORC Code Table 1 :

Geology and geological interpretation	The Kapunda Mineral Resource is located in the Tindelpina Shale Member of the Tapley Hill Formation. Kapunda 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.
Sampling and sub sampling techniques	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. K series sample recoveries were visually estimated and recorded for each interval. No historic information is available for KP series holes. 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. 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). 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.
Drilling techniques	A summary of the drilling undertaken at Kapunda is presented in table below.

Hole type	Prefix	Company	Total
Diamond core	KP	Mines Exploration (1965-66)	3
	K	Northlands (1972-73)	52
	KD	Utah (1974-76)	23
	Total		**78**
Percussion	KV	Mines Exploration (1966-67)	43
	M	Noranda (1970)	24
	Z	Noranda (1970)	1
	KP	Utah (1974-76)	36
	SM	Copper Range (2008)	1
	SK	Copper Range (2008)	4
	Total		**109**
All drilling			**187**

	Total meterage of all drillholes - 22,712.8m.
Criteria used for classification,	The whole Kapunda Mineral Resource has been classified as Inferred. 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 modelling will be required.
Sample analysis method	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. 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. 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.

Estimation methodology	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. 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. The selective mining unit reflects ISR as the proposed extractive technique. No correlation between variables assumptions is made. 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. 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. 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.
Cut-off Grades	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. 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
Mining & metallurgical methods & parameters	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. 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. 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.

For further information, please contact:

THOR MINING PLC

Mick Billing Executive Chairman

+61 8 7324 1935

Competent Person's Report

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.

Updates on the Company's activities are regularly posted on Thor's website www.thormining.com, which includes a facility to register to receive these updates by email, and on the Company's twitter page @ThorMining.

About Thor Mining PLC

Thor Mining PLC is a resources company quoted on the AIM Market of the London Stock Exchange and on ASX in Australia.

Thor holds 100% of the advanced Molyhil tungsten project in the Northern Territory of Australia, for which an updated feasibility study in 2015[1] suggested attractive returns.

Thor also holds 100% of the Pilot Mountain tungsten project in Nevada USA which has a JORC 2012 Indicated and Inferred Resources Estimate[2] on 2 of the 4 known deposits.

Thor is also acquiring up to a 60% interest Australian copper development company Environmental Copper Recovery SA Pty Ltd, which in turn holds rights to earn up to a 75% interest in the mineral rights and claims over the portion of the historic Kapunda copper mine in South Australia recoverable by way of in situ recovery.

Thor has a material interest in US Lithium Pty Limited, an Australian private company with a 100% I nterest in a Lithium project in Nevada, USA.

Finally, Thor also holds a production royalty entitlement from the Spring Hill Gold project[3] of:

- *A$6 per ounce of gold produced from the Spring Hill tenements where the gold produced is sold for up to A$1,500 per ounce; and*
- *A$14 per ounce of gold produced from the Spring Hill tenements where the gold produced is sold for amounts over A$1,500 per ounce.*

Notes

- [1] Refer ASX and AIM announcement of 12 January 2015
- [2] Refer AIM announcement of 22 May 2017 and ASX announcement of 23 May 2017
- [3] Refer AIM announcement of 26 February 2016 and ASX announcement of 29 February 2016

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

Criteria	JORC Code explanation	Commentary
		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.

Hole type	Prefix	Company	Total
Diamond core	KP	Mines Exploration (1965-66)	3
	K	Northlands (1972-73)	52
	KD	Utah (1974-76)	23
	Total		**78**
Percussion	KV	Mines Exploration (1966-67)	43
	M	Noranda (1970)	24
	Z	Noranda (1970)	1
	KP	Utah (1974-76)	36
	SM	Copper Range (2008)	1
	SK	Copper Range (2008)	4
	Total		**109**
All drilling			**187**

Criteria	JORC Code explanation	Commentary
		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.

Criteria	JORC Code explanation	Commentary
	• *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. 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.

Criteria	JORC Code explanation	Commentary
	• *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.
	• *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or*	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

Criteria	JORC Code explanation	Commentary
	dry.	$^{1}/_{16}{}^{th}$ 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*	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
	precision have been established.	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

Criteria	JORC Code explanation	Commentary
		(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 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.

Criteria	JORC Code explanation	Commentary
	• *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 reported if material.*	Drilling orientation is not deemed to have introduced any significant sampling bias.
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

Criteria	JORC Code explanation	Commentary
		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) 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.

Criteria	JORC Code explanation	Commentary
		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* • *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.*	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
	• *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 5 and 6 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 5.

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.

Criteria	JORC Code explanation	Commentary
	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

Criteria	JORC Code explanation	Commentary
		interpolation and reporting were completed using Maptek's Vulcan software.
	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.

Criteria	JORC Code explanation	Commentary
	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.
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.

Criteria	JORC Code explanation	Commentary
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.
	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.

Criteria	JORC Code explanation	Commentary
	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.
	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%.