ASX:HAS Announcement

18 August 2021

Ore Sorting Testwork results in 26% Uplift in Mine Head Grade

Highlights:

Test work on adding an ore sorter to Yangibana's process flowsheet has delivered the following significant life of mine improvements including:

- **26% upgrade** to the life of mine total rare earths oxide (TREO) grade;
- **96% overall** TREO recoveries after ore sorting;
- **7.1% improvement** in concentrate recovery on sorted Simon's Find ore samples;
- **8.0% improvement** in concentrate recovery on sorted Bald Hill ore samples;
- **24% upfront mass rejection** of primary crusher feed, resulting in:
  - **24% reduction** of beneficiation plant reagent consumption;
  - **24% reduction** in required tailings storage facility size for the life of mine; and
  - **effective mitigation** of the risk of mining dilution.
- Ore sorting test work continues to **validate the positive impacts** on the Yangibana process flowsheet:
  - Engineering development is progressing to incorporate the ore sorting circuit into the beneficiation process flowsheet.

Australia's next rare earths producer, Hastings Technology Metals Ltd (**ASX: HAS**) (**Hastings** or the **Company**) is pleased to announce that ore sorting test work on samples sourced across the Yangibana Rare Earths Project (**Yangibana**), in Western Australia's Gascoyne region, has confirmed its suitability within the beneficiation process, delivering early gangue mineral rejection and a significant upgrade of rare earths material prior to the higher-cost processing steps.

The ore sorting test results confirmed that the total rare earths oxide (**TREO**) recovery through the ore sorter is a linear function, where the lower the head grade the higher the mass rejection becomes. It is therefore forecast, based on the average content of alumina and silica for all Yangibana deposits, that 24% of the proposed crusher feed will be rejected by the ore sorters as waste at the expense of only 4% TREO volumes across the life of mine (LOM) schedule.

The variability test work program was completed testing 12 samples from across the Yangibana deposits. The performance of the ore sorters is closely linked to head grade, resulting in LOM mass rejection of 24% with a corresponding increase in average grade of TREO content of 26%.

Commenting on the ore sorter test work, Hastings Technology Metals Chief Operating Officer Andrew Reid said:

> *"These results are enormously satisfying and exceeded all our expectations – the introduction of ore sorting has removed waste or very low-grade material to deliver a significant overall improvement in the mine head grade that will be put through the more advanced stages of Yangibana's process flow sheet.*
>
> *"This, in turn, has the potential to reduce Yangibana's processing operating costs and further enhance the value of the industry high levels of neodymium and praseodymium (**NdPr**) contained in our ore bodies.*
>
> *"Importantly, the rejection of the waste or very low-grade material at the front end of the process has had almost no impact on Yangibana's LOM, underpinning the potential win-win of adding the ore sorter to the overall process flow sheet.*
>
> *"Hastings will now progress the detailed design for an ore sorting system that can process 100% of Yangibana's LOM mine feed material."*

Initial bulk test work was completed in 2019 (see ASX announcement dated 25 November 2019 *Bulk Ore Sorting Trial Shows Outstanding Results*). This test work program assessed various sorting sensors on small-scale samples and optimisation of the set-up for the XRT sensors on a bulk sample.

A more extensive ore sorting variability test program has now been completed on drill core obtained from the proposed pit areas of Bald Hill, Simon's Find, Frasers, Yangibana, Yangibana North-West and Auer. The drill core samples were crushed, screened and sorted using an XRT ore sorter. The sorted samples and their corresponding unsorted samples were then tested in separate batch flotation bench tests at ALS laboratories in Perth. A total of 12 samples was tested through the sorting and flotation phase. In addition, two sets of composite samples were tested through the flotation stages of the process flow sheet.

Flotation results on the 12 samples confirmed that the sum of the sorted samples made a rare earths concentrate 7% higher in Nd_2O_3+Pr_6O_{11} recovery and 1% higher in Nd_2O_3+Pr_6O_{11} grade compared with the sum of the corresponding unsorted samples.

Four composite samples (two sorted; two unsorted) were made from the sorted and their corresponding unsorted samples to simulate a blended crusher feed stock from Simon's Find and a blended crusher feed stock from Bald Hill. Compared with unsorted composite samples, the sorted samples delivered a much higher Nd_2O_3+Pr_6O_{11} recovery (Table 1 and Table 2).

Table 1: Flotation Performance of Simon's Find Composite Sample - Sorted vs Unsorted

Samples	Nd Recovery	Nd Grade
Ore Sorting Variability Composite – Unsorted	82.10%	7.10%
Ore Sorting Variability Composite – Sorted	89.20%	7.70%

Table 2: Flotation Performance of Ball Hill Composite Sample - Sorted vs Unsorted

Samples	Nd Recovery	Nd Grade
Ore Sorting Variability Composite – Unsorted	83.2%	6.7%
Ore Sorting Variability Composite – Sorted	91.2%	6.3%

The results of the ore sorting variability test work demonstrate that the ore sorter excels at both creating high-grade products for this material as well as maintaining high recoveries with significant mass reduction, relative to the amount of non-ironstone dilution included in the feed sample.

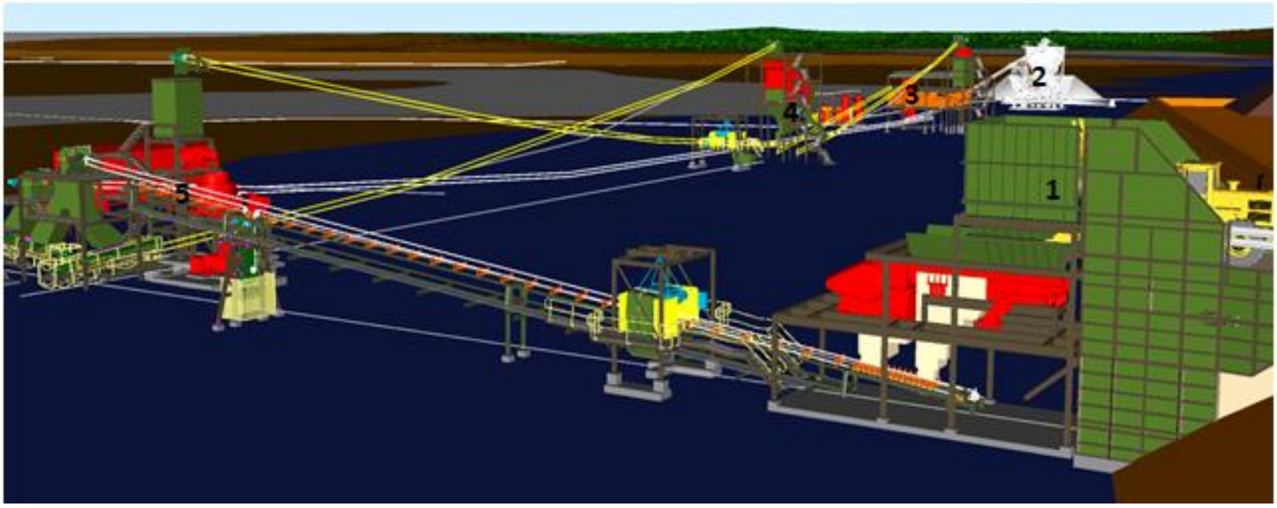

Figure 1: Conceptual initial engineering design of crushing, screening and ore sorting circuit, viewing westwards
1: Primary crusher. 2: Waste stockpile. 3: Ore sorting plant. 4: Screening plant. 5: Secondary crushing plant.

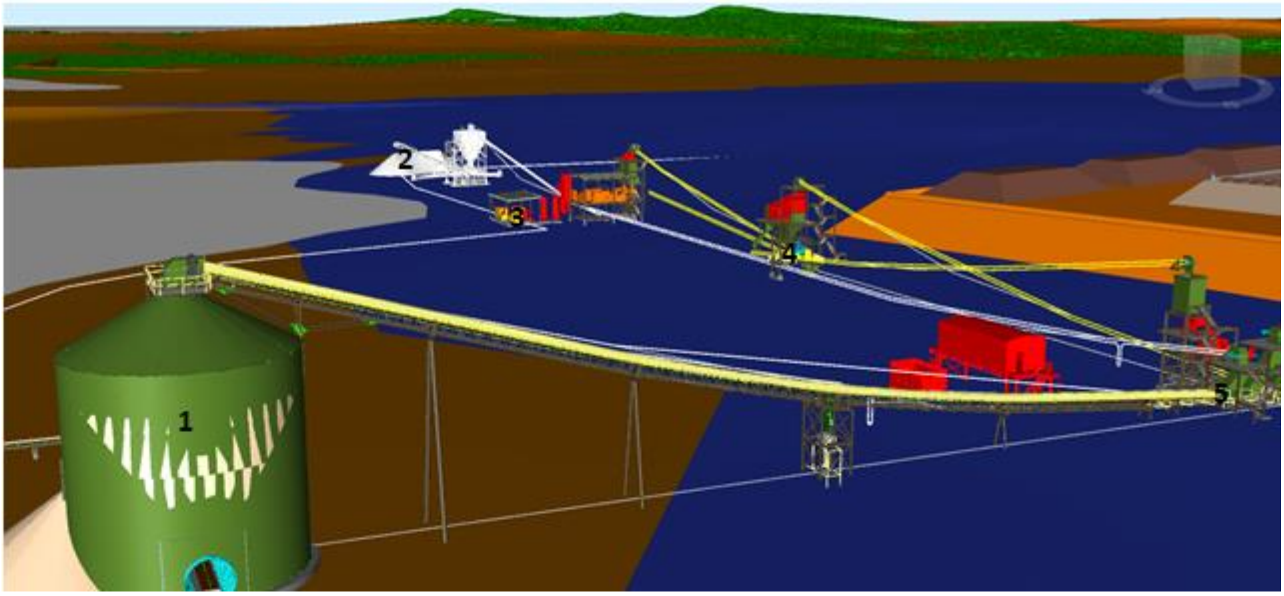

Figure 2: Conceptual initial engineering design of crushing, screening and ore sorting circuit, viewing northwards
1: Fine ore bin. 2: Waste stockpile. 3: Ore sorting plant. 4: Screening plant. 5: Secondary crushing plant.

Table 3: Variability test hole ID's, TREO grades, waste rejection percentages and TREO recoveries.

Sample	Crusher feed mass (kg)	Crusher feed grade TREO (%)	Waste rejected mass percent	Waste grade TREO (%)	Mill feed grade TREO (%)	TREO recovery
AUDD259	136.3	1.03	30%	0.11	1.42	96.90%
BHDD528	125.7	0.77	13%	0.16	0.86	97.30%
BHDD529	84.7	1.24	24%	0.21	1.61	95.90%
BHDD530	18.1	1.38	41%	0.31	2.1	90.90%
BHDD531	228.2	0.5	45%	0.08	0.86	93.20%
FRDD259	46.7	0.51	26%	0.33	0.58	83.30%
FRDD260	72	0.27	39%	0.08	0.38	88.00%
SFDD195	242.4	0.61	36%	0.11	0.89	93.40%
SFDD196	121.3	0.79	32%	0.35	1	85.80%
SFDD198	70.3	0.38	34%	0.17	0.49	84.40%
YWDD079	165.7	1.19	46%	0.14	2.11	94.60%
YADD166	80.3	0.4	61%	0.18	0.74	72.90%

This announcement has been approved by the Board for release to the ASX.

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About Hastings Technology Metals Limited

Hastings Technology Metals Limited (ASX: HAS) is a Perth based rare earths company primed to become the world's next producer of neodymium and praseodymium concentrate (NdPr). NdPr are vital components used to manufacture permanent magnets used every day in advanced technology products ranging from electric vehicles to wind turbines, robotics, medical applications, digital devices, etc.

Hastings' flagship Yangibana project, in the Gascoyne region of Western Australia, contains one of the most highly valued NdPr deposits in the world with NdPr:TREO ratio of up to 52%. The site is permitted for long-life production and with offtake contracts signed and debt finance in advanced stage targeted for completion in 3Q2021. Construction is scheduled to start in mid-2021 ahead of first production in late 2023.

Hastings also owns the Brockman project, Australia's largest heavy rare earths deposit, near Halls Creek in the Kimberley. Brockman hosts a Mineral Resource hosting Total Rare Earths Oxides (TREO).

Hastings Mineral Resource and Reserve have been reported in compliance with the JORC code.

For further information on the Company and its projects visit www.hastingstechmetals.com

Authorised for release

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Competent Person Statements

The scientific and technical information in this announcement and that relates to process metallurgy is based on information reviewed by Ms. Narelle Marriott (Principal Engineer – Beneficiation) and Mr. Zhaobing (Robin) Zhang (Process Engineering Manager) of Hastings Technology Metals Limited. Both Ms. Marriott and Mr. Zhang are members of the AusIMM. Each has sufficient experience 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 by the JORC Code 2012. Both Ms. Marriott and Mr. Zhang own shares in the company and participate in the company employee share plan. Ms. Marriott and Mr. Zhang consent to the inclusion in this announcement of the matters based on their information in the form and context in which it appears.

JORC Code, 2012 Edition – Ore sorting testwork

Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Sampling techniques	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. Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used. 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.	Samples used in the ore sorting variability testwork program were derived from diamond drilling. Continuous intervals for testing were selected based on geological logging and assay results from earlier drill holes from RC drilling programs. Full PQ drill core was used for the testwork. The whole interval selected for testing was stage crushed to target size and screened to create a sortable size fraction for ore sorter testing. The combined assay and mass of fines fraction plus ore sorter product were used to assess the overall performance of ore sorting. Samples used for flotation performance comparison between sorter and unsorted were composited using mass splits to each of the separate testwork product streams. Samples were pulverised and fused and analysed using XRF.
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).	PQ Diamond drill core was used for this testwork
Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed. Measures taken to maximise sample recovery and ensure representative nature of the samples. Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.	Full core was used for the testwork

Criteria	JORC Code explanation	Commentary
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. Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography. The total length and percentage of the relevant intersections logged.	All drill chip samples are geologically logged at 1m intervals from surface to the bottom of each individual hole to a level that supports appropriate future Mineral Resource studies. • Logging is considered to be semi-quantitative given the nature of reverse circulation drill chips. • All RC drill holes in the previous programme were logged in full.
Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken. If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry. For all sample types, the nature, quality and appropriateness of the sample preparation technique. Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples. Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling. Whether sample sizes are appropriate to the grain size of the material being sampled.	All Core samples used for testwork were continuous intervals and full diameter PQ core.
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. 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. 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.	All assays were completed at ALS Perth, using their assay standards, methods and quality control procedures.
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel. The use of twinned holes.	At least two company personnel verify all significant intersections as well as the independent geological database provider. • All geological logging and sampling information is completed firstly on to paper logs before being transferred to Microsoft Excel spreadsheets and

Criteria	JORC Code explanation	Commentary
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols. Discuss any adjustment to assay data.	subsequently a Microsoft Access database. Physical logs and sampling data are returned to the Hastings head office for scanning and storage. Electronic copies of all information are backed up daily. • All 2020 field geological data capture was completed directly into excel or Ocris. • No adjustments of assay data are considered necessary.
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. Specification of the grid system used. Quality and adequacy of topographic control.	• Final drillhole collars completed during 2014-2020 drill campaigns were collected by MHR Surveyors using DGPS utilising a locally established control point. Accuracies of the drillhole collar locations collected by MHR Surveyors is better than 0.1m. • Elevation data was recorded by MHR Surveyors. • Down hole surveys are conducted by the drill contractors using a Reflex electronic single-shot camera with readings for dip and magnetic azimuth nominally taken every 30m down hole, except in holes of less than 30m. The instrument is positioned within a stainless-steel drill rod so as not to affect the magnetic azimuth. • Grid system used is MGA 94 (Zone 50)
Data spacing and distribution	Data spacing for reporting of Exploration Results. 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. Whether sample compositing has been applied.	• Substantial areas of the main Bald Hill deposit have been infill drilled at a staggered 50m x 50m pattern, giving an effective 35m x 35 spacing, with some areas infilled to 20m x 20m and 20m x 10m in the 2018 drilling programme. In general, and where allowed by the kriging parameters, this allows portions of the deposit to be classified in the Measured category. Areas of 50m x 50m spacing are generally classified as Indicated, while zones with wider spacing or where blocks are extrapolated are generally classified as Inferred category. • Bald Hill South has a small area of Measured category with nominal 25m x 25m spacing area of Indicated category (a mixture of 50m x 50m and 50m x 25m spacing) and an Inferred category area in the south and west with wider spacing • The main part of the Fraser's deposit has some areas of Measured category where there is infill drilling at nominally 25m x 25m, with much of the rest being Indicated category, where spacing is typically 50m x 50m. Down-dip zones of mineralisation with higher variances are supported by a number of deep intersections and have been classified as Inferred category.

Criteria	JORC Code explanation	Commentary
		• Yangibana West and North drill spacing is typically 50m x 50m with some new infill areas in the east. Down dip extension has been limited due to the distribution of drilling relative to the mineralisation wireframes. As a result of this infill drilling, combined with improved variography, some Measured category material has been defined. • At the Yangibana deposit drill spacing is nominally on 50m sections, and the upper part of the resource is generally classified as Indicated category while the lower, extensional areas are Inferred category. • Section spacing at Auer is predominantly 50m with some areas of 25m spacing and others at 100m; down dip spacing is typically 50m. Due to limited bulk density information the closer spaced areas have been assigned an Indicated classification, though the majority of the Auer deposit has only two or three holes per section, resulting in these areas being classified as Inferred category. • A significant amount of infill drilling at Auer North in 2017-2018 has increased confidence in what was previously Inferred material; a reasonably large proportion of Auer North is now in the Indicated category, with drill spacing typically on 25 to 50m sections with the remainder being Inferred, at depth and where section spacing is greater than 50m. • No sample compositing is used in this report, all results detailed are the product of 1m downhole sample intervals.
Orientation of data in relation to geological structure	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type. If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.	Most drill holes in the 2020 programme are angled (subject to access to the preferred collar position) collared at -60o or -70o in steeper and deeper mineralised areas such as Auer, Simon's Find, Bald Hill and Fraser's. Some holes were drilled vertically at the same position as angled holes to eliminate the need for further ground clearing.
Sample security	The measures taken to ensure sample security.	• From Yangibana site the chain of custody is managed by the project geologist who labels core trays and dispatches them to Perth • Samples were delivered by Hastings personnel to the Nexus Logistics base in order to be loaded on the next available truck for delivery to ALS • The freight provider delivers the samples directly to the laboratory.

Criteria	JORC Code explanation	Commentary
		• The metallurgist managed chain of custody within the test work program, ensuring that all samples, testwork products and subsamples are clearly named and labelled.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	• A materials and chemical balance has been completed for the testwork program • All testwork was carried out by commercial laboratories and testwork facilities, with input and observation by Hastings Metallurgical personnel • No additional auditing of testwork has been undertaken.

Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

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 security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.	• Testwork has been undertaken on samples from numerous tenements within the Yangibana Project. • All Yangibana tenements are in good standing and no known impediments exist.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	Ten of the Yangibana prospects were previously drilled to a limited extent by Hurlston Pty Limited in joint venture with Challenger Pty Limited in the late 1980s. Auer and Auer North were first drilled by Hastings in 2016.
Geology	Deposit type, geological setting and style of mineralisation.	• The Yangibana ironstones within the Yangibana Project are part of an extensive REE-mineralised system associated with the Gifford Creek Carbonatite Complex. The lenses have a total strike length of at least 12km. • These ironstone lenses have been explored previously for base metals, manganese, uranium, diamonds and rare earths. • The ironstones are considered by GSWA to be coeval with the numerous carbonatite sills that occur within Hastings tenements, or at least part of the same magmatic/hydrothermal system.
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. 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.	A total of 12 variability samples from across the Yangibana Project deposits of Auer, Bald Hill, Fraser's, Simon's Find, Yangibana and Yangibana North/West were tested through the full testing program. Ore sorting testwork results for individual samples are shown in table 3 in the main body of the announcement.

Criteria	JORC Code explanation	Commentary
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. The assumptions used for any reporting of metal equivalent values should be clearly stated.	• No top-cuts have been applied. No metal equivalent values are used for reporting exploration results.
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').	• True widths are generally estimated to be about 70% of the down-hole width.
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.	ASX drilling announcements on the • 17 September 2020 • 12 October 2020 • 16 November 2020 • 21 January 2021 • 8 February 2021 • 26 February 2021 Contains all relevant geological information and diagrams, tabulations and data forming the basis as part of this announcement.
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.	All significant intersections have been reported. All drill hole locations from the 2020 drill program have been previously reported. See ASX list above. All samples processed through the full ore sorting and flotation variability program have been reported.
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	Geological mapping has continued in the vicinity of the drilling as required.

Criteria	JORC Code explanation	Commentary
	characteristics; potential deleterious or contaminating substances.	
Further work	The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling). Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	No further ore sorting testwork is planned. Translation of these results into engineering design, and impact on capital and operating costs is ongoing.