HASTINGS
Technology Metals Limited

## ASX:HAS Announcement

15 June 2021

# Stand-out Simon's Find metallurgical test results further enhance the Yangibana Project

## Highlights

- Metallurgical test work from Simon's Find deposit, part of the Yangibana Rare Earths Project, has delivered strong results:
    - 86% beneficiation recovery generating a concentrate grade of 8.9% $Nd_2O_3$ from flotation test work.
    - 98% recovery through hydrometallurgical acid bake and water leach test work on flotation samples.
- Beneficiation concentrate results from Simon's Find are comparable to other Yangibana deposits which have much higher mined TREO grades.
- Results show an average beneficiation $Nd_2O_3$ upgrade factor of 28 times from the calculated head grade, equivalent to a concentrate grade of 19% TREO.
    - Upgrade factors up to 50 times the calculated head grade, producing a concentrate grade up to 29% TREO were reported in many samples.
- Up to 57% of Simon Find's TREO is neodymium and praseodymium ($Nd_2O_3$ + $Pr_6O_{11}$) – a ratio unrivalled for any known rare earths deposit worldwide.
- Ore sorting variability test results indicated that the head grade of Simon's Find can be upgraded from an average grade of 0.58% to 0.84% TREO, an increase of 45%.
    - Simon's Find samples that were ore sorted, upgraded faster in flotation with superior TREO recoveries when compared to the unsorted feedstock.
- These results are being fed into the Yangibana Project updated Ore Reserves estimate, for which a maiden ore reserve estimate will be defined for Simon's Find.

Australia's next rare earths producer Hastings Technology Metals Ltd (**ASX: HAS**) (**Hastings** or the **Company**) is pleased to announce stand-out results from metallurgical test work carried out on drilling samples from Simon's Find, one of the key deposits that make up the Yangibana Rare Earths Project (**Yangibana**) in Western Australia's Gascoyne region.

The test work carried out at Simon's Find is a key milestone in the Company's finalisation of its updated Ore Reserves and mine scheduling that will underpin Yangibana's development.

The Simon's Find deposit is part of the 8km-long Bald Hill – Simon's Find – Frasers mineralised trend and is strategically located close to the site of Yangibana's proposed process plant and infrastructure.

The mineralisation at Simon's Find contains the highest level of $Nd_2O_3 + Pr_6O_{11}$ to total rare earth oxides (**TREO**) across all deposits at Yangibana – in fact, they are the highest NdPr levels of any known rare earths project in the world. The average of samples tested reported $Nd_2O_3 + Pr_6O_{11}$ oxide accounting for 54% of TREO. Values as high as 57% were recorded in individual samples.

Simon's Find has, on average, a much lower TREO head grade than the other Yangibana deposits. However, its industry high NdPr levels and an amenability to producing a clean monazite concentrate mean Simon's Find is able to deliver the same outstanding final results as the other deposits at Yangibana.

Test work completed to date has investigated the flotation performance of a representative composite sample from the Simon's Find drilling program in 2020 and earlier as well as 22 individual variability samples. The flotation performance on the composite sample resulted in an $Nd_2O_3$ recovery of 86.3% at 8.9% $Nd_2O_3$ grade, which is comparable to the 2017 Definitive Feasibility Study baseline of a recovery of 86.4% recovery at 9.0% $Nd_2O_3$ grade.

Variability test work within the Simon's Find deposit aimed to test some of the different parameters of the mineralisation and develop an understanding of ore blending requirements. Two blends of a composite sample concentrate were tested through acid bake and water leach hydrometallurgical tests. The acid bake and water leach tests achieved an $Nd_2O_3$ recovery of 98%, which is 4% higher than at other Yangibana deposits. The final water leach liquor chemistry was consistent with that of other deposits across Yangibana and suitable for further downstream impurity removal and mixed rare earths concentrate (**MREC**) precipitation steps designed for the project.

Simon's Find also contains a relatively high level of niobium, mostly in the mineral columbite. Deportment of niobium throughout the process flowsheet is still being assessed.

Ore sorting variability test work indicated that the average grade at Simon's Find could be upgraded during ore sorting from 0.58% to 0.84% TREO. Early flotation test work on sorted and unsorted ore indicated that the addition of ore sorting into the circuit could improve the flotation performance.

The test work results from this recent program will be used for ongoing Ore Reserves calculations.

*Figure 1 - (L-R) Flotation test, acid bake product, water leach in progress, final water leach liquor.*

**Commenting on the results of the Simon's Find test work, Hastings Technology Metals' Chief Operating Officer Andrew Reid said:**

> *"The metallurgical test work carried out at Simon Find's underscores the potential that we have at Yangibana. These latest results continue to give us confidence in the multiple pathways we have to achieving high process recoveries and concentrate grades from the Yangibana project.*
>
> *"Simon's Find is delivering stand-out results that are remarkable given the low head grade of the deposit. Further test work will enable us to optimise the various aspects of our metallurgical program in terms of capital, operating costs, recoveries and operability.*
>
> *"Simon's Find further highlights Yangibana's potential to become a source rich in NdPr."*

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

## 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 (General Manager -Process Engineering) 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 – Yangibana project deposits 2021

### 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.<br>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.<br>Aspects of the determination of mineralisation that are Material to the Public Report.<br>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 to assess the numerous deposits of the Yangibana Project have been derived from both reverse circulation (RC) and diamond drilling. Nine drilling programmes have been completed to date with more than 2,000 holes drilled for >100,000m.<br>• Samples from each metre were collected in a cyclone and split using a 3-level riffle splitter. Field duplicates, blanks and Reference Standards were inserted at a rate of approximately 1 in 20.<br>• RC and diamond drilling leading to the establishment of JORC Resources has been carried out at Bald Hill, Frasers's, Yangibana North-West, Auer, Auer North, and Yangibana, within tenements held 100% by Hastings, and at Yangibana and Yangibana Northwest in tenements in which Hastings has a 70% interest. |
| 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). | • Reverse Circulation drilling at the various targets utilised a nominal 5 1/4 inch diameter face-sampling hammer.<br>• Diamond drilling at various targets has been NQ and HQ diameter. |
| Drill sample recovery | Method of recording and assessing core and chip sample recoveries and results assessed.<br>Measures taken to maximise sample recovery and ensure representative nature of the samples. | • Recoveries are recorded by the geologist in the field at the time of drilling/logging. During the 2020 program all bags were weighed in the field.<br>• If poor sample recovery is encountered during drilling, the geologist and driller have endeavoured to rectify the problem to ensure maximum sample |

| 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. | recovery. Visual assessment is made for moisture and contamination. A cyclone and splitter were used to ensure representative samples and were routinely cleaned.<br>• Sample recoveries to date have generally been reasonable, and moisture in samples minimal. Data from 2020 is available at present to determine if a relationship exists between recovery and grade exist, however this work has not been completed as yet. |
| 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.<br>Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.<br>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.<br>• Logging is considered to be semi-quantitative given the nature of reverse circulation drill chips.<br>• 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.<br>If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.<br>For all sample types, the nature, quality and appropriateness of the sample preparation technique.<br>Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.<br>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.<br>Whether sample sizes are appropriate to the grain size of the material being sampled. | • The RC drilling rig is equipped with an in-built cyclone and triple tier riffle splitting system, which provided one bulk sample of approximately 25kg, and a sub-sample of 2-4kg per metre drilled.<br>• All samples were split using the system described above to maximise and maintain consistent representivity. Most samples were dry. For wet samples the cleanliness of the cyclone and splitter was constantly monitored by the geologist and maintained to avoid contamination.<br>• Bulk samples were placed in green plastic bags, with the sub-samples collected placed in calico sample bags.<br>• Field duplicates were collected directly from the splitter as drilling proceeded through a secondary sample chute. These duplicates were designed for lab checks as well as lab umpire analysis.<br>• A sample size of 2-4kg was collected and considered appropriate and representative for the grain size and style of mineralisation.<br>• Samples used in the metallurgical testwork programs were split from the RC drilling material using a riffle splitter. Ore intervals for each hole were combined from 1 metre intervals, control crushed and blended prior to splitting for use in testwork.<br>• Samples used for ore sorting testwork were HQ diamond drill core. Whole core intervals were selected to include both ore and dilution waste from both hanging and footwalls. |

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| 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.<br>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.<br>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. | • Genalysis (Perth) was used for all analysis work carried out on the 1m drill chip samples and the rock chip samples. The laboratory techniques below are for all samples submitted to Genalysis and are considered appropriate for the style of mineralisation defined at the Yangibana REE Project: FP6/MS<br>• Blind field duplicates were collected at a rate of approximately 1 duplicate for every 20 samples that are to be submitted to Genalysis for laboratory analysis. Field duplicates were split directly from the splitter as drilling proceeded at the request of the supervising geologist.<br>• ALS Metallurgy (Perth) was used for all metallurgical testwork assay analysis. |
| Verification of sampling and assaying | The verification of significant intersections by either independent or alternative company personnel.<br>The use of twinned holes.<br>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.<br>Discuss any adjustment to assay data. | • At least two company personnel verify all significant intersections as well as the independent geological database provider.<br>• All geological logging and sampling information is completed firstly on to paper logs before being transferred to Microsoft Excel spreadsheets and 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.<br>• All 2020 field geological data capture was completed directly into excel or Ocris.<br>• 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.<br>Specification of the grid system used.<br>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.<br>• Elevation data was recorded by MHR Surveyors.<br>• 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.<br>• Grid system used is MGA 94 (Zone 50) |
| Data spacing and distribution | Data spacing for reporting of Exploration Results.<br>Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the | • 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 |

| Criteria | JORC Code explanation | Commentary |
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| | Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.<br>Whether sample compositing has been applied. | 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.<br>• 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<br>• 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.<br>• 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.<br>• 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.<br>• 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.<br>• 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.<br>• No sample compositing is used in this report, all results detailed are the product of 1m downhole sample intervals. |
| Orientation of data in relation | Whether the orientation of sampling achieves unbiased sampling of possible structures and | • Most drill holes in the 2020 programme angled (subject to access to the preferred collar position) |

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| to geological structure | the extent to which this is known, considering the deposit type.<br>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. | collared at -60° or -70° 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. | • The chain of custody is managed by the project geologist who places calico sample bags in polyweave sacks. Up to 10 calico sample bags are placed in each sack. Each sack is clearly labelled with:<br>• Hastings Technology Metals Ltd<br>• Address of laboratory<br>• Sample range<br>• Samples were delivered by Hastings personnel to the Nexus Logistics base in order to be loaded on the next available truck for delivery to Genalysis<br>The freight provider delivers the samples directly to the laboratory. Detailed records are kept of all samples that are dispatched, including details of chain of custody. |
| Audits or reviews | The results of any audits or reviews of sampling techniques and data. | • An audit of sampling has been completed. Additional umpire sampling was completed. A new source of standards is being used to cross-check data from existing standards and assayed samples that were acquired in the drilling programs comprising the resource. |

## 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.<br>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. | • Drilling has been undertaken on numerous tenements within the Yangibana Project.<br>• 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.<br>• These ironstone lenses have been explored previously for base metals, manganese, uranium, diamonds and rare earths.<br>• 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:<br>easting and northing of the drill hole collar<br>elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar<br>dip and azimuth of the hole<br>down hole length and interception depth<br>hole length.<br>If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case. | • Not applicable as no drilling exploration results are being announced |

| 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.<br>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.<br>The assumptions used for any reporting of metal equivalent values should be clearly stated. | • Not applicable as no exploration results are being announced |
| Relationship between mineralisation widths and intercept lengths | These relationships are particularly important in the reporting of Exploration Results.<br>If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.<br>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'). | • Not applicable as no exploration results are being announced |
| 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. | • Not applicable as no exploration results are being announced |
| 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. | • Not applicable as no exploration results are being announced |
| 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. | • Geological mapping has continued in the vicinity of the drilling as the programme proceeds. |
| Further work | The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling). | • Numerous targets exist for expansion of the current JORC Mineral Resources within the Yangibana Project, as extensions to defined deposits, new targets identified from the |

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| | Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive. | Company's various remote sensing surveys, and conceptual as yet untested targets at depth. |