4 November 2019

Hastings Technology Metals Limited

ABN 43 122 911 399

ASX Stock Code: HAS

Address:

Level 8 Westralia Plaza
167 St Georges Terrace
Perth WA 6000

Box 6 Westralia Plaza
167 St Georges Terrace
Mercantile Lane
Perth WA 6000

Telephone: +61 8 6117 6118

info@hastingstechmetals.com

18% INCREASE IN ORE RESERVES, MINE LIFE EXTENDED 2 YEARS TO 13 YEARS

- **Increase in Neodymium and Praseodymium Oxide (Nd_2O_3+Pr_6O_{11}) of 4,800t or 11% to 49Kt, the key components for Electric Vehicle permanent magnets.**
- **Increase in Total Rare Earths Oxide (TREO) of 11,900t or 9% to 138Kt.**
- **Updated Ore Reserve extends mine life by 2 years, supporting a 13-year operational life for the Project.**
- **Probable Ore Reserve tonnes increased 18% to 12.20 million tonnes at 1.13%TREO including 0.40%Nd_2O_3+Pr_6O_{11}.**
- **Project NPV increased by 6% to A$549 million confirming outstanding project economics.**

Introduction

The Directors of Hastings Technology Metals Limited (ASX:HAS) are pleased to announce an increase in the Probable Ore Reserves at the Yangibana Project in the Gascoyne region of Western Australia. Total Probable Ore Reserves have increased to **12.20 million tonnes at 1.13%TREO including 0.40%Nd_2O_3+Pr_6O_{11}**, an 18% increase in ore reserve tonnes compared to the previously announced ASX release entitled “Reserves Increase by 34% to 10.35MT covering 10 Years Operation at Yangibana Project” dated 29 January 2019.

Charles Lew, Hastings Executive Chairman, said *“with this increase in mining reserves and corresponding mine life, Hastings has one of the most exciting rare earths projects amongst our peers which has been strategically and purposefully developed over the last few years. Importantly the work completed during 2019 has significantly de-risked the project thereby delivering a high degree of confidence in our mine scheduling and future production.”*

Probable Ore Reserves

Based on the Definitive Feasibility Study (DFS) (completed in November 2017) information and recent geological, geotechnical, metallurgical and environmental work, independent consultant Intermine Engineering Consultants (Intermine) has completed an updated mining reserve estimate based on Measured and Indicated Mineral Resources at each of Bald Hill, Fraser's, Auer, Auer North, Yangibana, Yangibana West and Yangibana North deposits. This mining reserve estimate used Whittle pit optimisation software to create economic pit designs utilising conventional drill and blast, load and haul mining methods.

Modifying Factors used to estimate the new Ore Reserves are provided in the Table 1 Section 4 of the JORC Code (2012) at the end of this announcement.

Summary

The Mineral Resources as at 31 October 2019 is reported according to the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the 'JORC Code') 2012 edition. The Mineral Resources are reported inclusive of Ore Reserves.

Table 1: Total JORC (2012) Mineral Resources October 2019

Category	M Tonnes	%TREO	%$Nd_2O_3+Pr_6O_{11}$
Measured	4.15	1.15	0.43
Indicated	10.92	1.13	0.38
Sub-total	***15.07***	***1.13***	***0.39***
Inferred	6.18	1.09	0.35
TOTAL	***21.25***	***1.12***	***0.38***

Numbers may not add due to rounding. Includes JV tenement contributions.

The total Project Ore Reserve estimate as at 4 November 2019, is set out in Table 2 below:

Table 2: Total JORC (2012) Ore Reserves November 2019

Deposit	M Tonnes	%TREO	%$Nd_2O_3+Pr_6O_{11}$	$Nd_2O_3+Pr_6O_{11}$ as % of TREO
Bald Hill	4.97	1.03	0.41	40
Fraser's	0.90	1.51	0.64	42
Auer	1.50	0.95	0.33	35
Yangibana	1.36	0.91	0.44	48
Yangibana North	3.46	1.39	0.37	26
TOTAL	***12.20***	***1.13***	***0.40***	***37***

The updated Ore Reserve of 12.20 million tonnes represents an 18% tonnage increase compared to the previously announced mining reserve, which was the result of a successful geological re-interpretation of the mineralisation delineating the ore deposits. A significant increase in the Measured and Indicated Mineral Resources was generated through the re-interpretation and re-estimation process of the Mineral Resources. This process brought mineralisation previously un-classified and uneconomic from outside of the original geological wireframes inside of the new wireframes, as announced in ASX Release "13% Increase in Measured and Indicated Mineral Resources 31 October 2019".

The resultant Mineral Resource upgrading has extended the mine life from 11 years to 13 years. The extension to mine life is underpinned by increases in the Ore Reserves of all of the economic pits, in particular the closest pits to the processing plant, Bald Hill and Frasers Pits. The Bald Hill pit alone represents over 40% of the Total Ore Reserves and supplies feed to the processing plant for almost 9 of the 13 years of mine life.

Mineral Resources

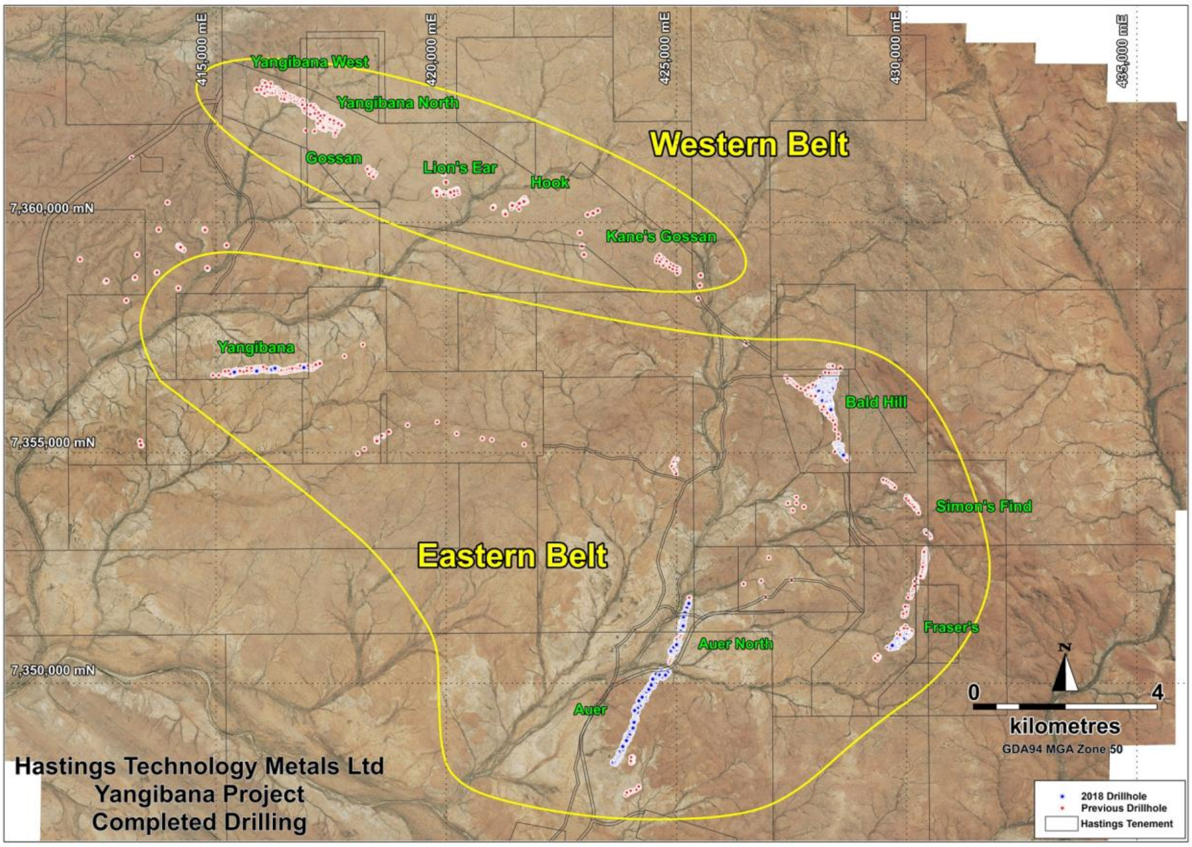

Figure 1 - Location of the Deposits Hosting Mineral Resources

Geology

The near surface mineralisation throughout the Yangibana Project is hosted by iron oxides and hydroxides termed ironstone, being the alteration products of the primary hosts ferro-carbonatite and phoscorite intrusive veins. The main rare earths-bearing mineral is monazite which has locally undergone alteration at shallow depths (to 25m depth) to its hydrous equivalent rhabdophane and to rare earths-bearing aluminium-phosphates such as florencite.

The deposits occur as narrow but strike extensive veins that have a range of dips from almost horizontal (10-20^{o}) to sub-vertical. The Fraser's deposit has the most extreme range from 5^{o} in portions towards its north-eastern end to 65^{o} at its southwestern end. Average true thickness varies from 2.2m to 3.5m throughout the Yangibana deposits although locally true thicknesses in excess of 20m occur.

Drilling

Hastings has completed eight drilling programmes comprising both reverse circulation (RC) and diamond drilling totalling more than 1,500 holes for 80,000m. Of these, 127 holes amounting to 7,485m are diamond drilled holes.

Holes were initially drilled at 50m spacings along strike and down dip. Infill drilling in areas with Mineral Resource potential has been undertaken at 37.5m, or less, spacing.

Most drill holes were vertical, subject to access availability, with holes into the steeper mineralised zones (Auer, Auer North, the southeastern portion of Fraser's) being at -60^{o} or -70^{o}. Internal surveys were carried out at 30m intervals downhole by the drilling contractors using a Reflex electronic single-shot camera within a stainless-steel drill rod.

Collar surveys were carried out by the Company using a Trimble RTX R1 GNSS receiver, with accuracies of approximately 50cm. The high-resolution Digital Terrain Model (DTM) commissioned by the Company has been used as the topographic control for all drillholes. A Relative Level (RL) was assigned to each drillhole collar based on the high-resolution DTM using Mapinfo Discover 3D.

RC holes have been drilled using a nominal 5¼ inch diameter face-sampling bit. Samples have been collected through a built-in cyclone with a triple-tier riffle-splitting system providing a large sample of approximately 25kg and a sub-sample of 2-4kg of which selected samples were sent for analysis, from each metre drilled. Field duplicates, blanks and Reference Standards were inserted at a rate of approximately 1 in 20.

Diamond core has been drilled at HQ size. The core is logged, and prospective zones are sawn into half and one half is then quartered with one quarter sent for analysis. Assayed intervals are based on geology with a minimum length of 0.2m.

Block Modelling Parameters – re-estimated Resources only

Due to the complexity and generally narrow nature of the mineralisation a 'third party' geological domain was inserted into the Multiple Indicator Kriged (MIK) modelling process such that the resulting mineralised domain proportions closely match those of the underlying wireframes. One metre down hole compositing based on the assay data was used to regularise the assayed intervals. Summary statistics for each deposit were used to identify the presence of outliers. As the estimated are based around MIK methodologies no grade top-cutting is performed in the estimation process.

For each deposit, variograms of the primary elements were defined and used in the mineral resource estimate. In all instances the directional trends evident in the variogram maps are evident to some extent in plan views of the sample data, and they normally conform to the orientation of the mineralisation within the wireframes. As expected, variogram model ranges in the vertical direction are relatively short due to the predominantly thin nature of the mineralisation. The majority of variograms display reasonable structure, with anisotropies reflecting those observed in the variogram maps.

All re-estimated mineral resources were created with the same panel size of 10m x 10m x 5m. This size was chosen as a compromise between the average drill spacing (up to 40m x 40m in some areas), size of the mineralisation wireframes (in order to limit resulting low mineralised proportions), orientation of mineralisation (ideally the panels would have been orientated with the mineralisation however this results in a model that is unusable for pit optimisation purposes) and the models' ultimate use for mine planning.

The Mineral Resources have been classified in the Measured, Indicated and Inferred categories, in accordance with the 2012 Australasian Code for Reporting of Mineral Resources and Ore Reserves (JORC) by the Competent Person. A range of criteria has been considered in determining the classification including geological and grade continuity, data quality, drill hole spacing, and modelling technique and kriging output parameters.

Re-Estimated (JORC 2012) Mineral Resources – by Deposit

The Probable Ore Reserves quoted in this document are derived from Measured and Indicated Resources as reported in the ASX announcement titled "13% INCREASE IN MEASURED AND INDICATED MINERAL RESOURCES" dated 31 October 2019. The current total Mineral Resources for the Yangibana Project that include the Probable Ore Reserves are as shown in Table 3.

Table 3: Total JORC Mineral Resources October 2019

Category	M* Tonnes	%TREO	%$Nd_2O_3+Pr_6O_{11}$
Measured	4.15	1.15	0.43
Indicated	10.92	1.13	0.38
Inferred	6.18	1.09	0.35
TOTAL	***21.25***	***1.12***	***0.38***

**Denotes million; numbers may not add up due to rounding. Includes JV tenement contributions.*

These resources are located at twelve different deposits within the overall project area as shown in Figure 1.

Probable Ore Reserves have been derived from the Measured and Indicated Mineral Resources at Bald Hill (M09/157 and M09/162 – Table 3), Fraser's (M09/158 – Table 4), Auer (E09/1989 – Table 5), Auer North (E09/1989 and E09/2018 – Table 6), Yangibana (M09/165 – Table 7) and Yangibana West (M09/160 – Table 8) within tenements in which Hastings holds 100% interest, and from the eastern extension of Yangibana (M09/163 – Table 7) and Yangibana North (M09/159 – Table 9) in which Hastings holds a 70% interest.

Table 4: Bald Hill Re-Estimated Mineral Resource, 100% Hastings

Category	M Tonnes	%TREO	%$Nd_2O_3+Pr_6O_{11}$
Measured	2.94	1.00	0.40
Indicated	2.53	0.96	0.38
Inferred	0.82	0.79	0.31
TOTAL	***6.29***	***0.96***	***0.38***

Table 5: Fraser's Re-Estimated JORC Mineral Resource, 100% Hastings

Category	M Tonnes	%TREO	%Nd2O3+Pr6O11
Measured	0.55	1.66	0.69
Indicated	0.37	1.32	0.55
Inferred	0.39	0.95	0.38
TOTAL	***1.32***	***1.35***	***0.56***

Table 6: Auer Re-Estimated Mineral Resource, 100% Hastings

Category	M Tonnes	%TREO	%Nd2O3+Pr6O11
Indicated	1.87	1.00	0.35
Inferred	0.90	1.01	0.35
TOTAL	***2.76***	***1.00***	***0.35***

Table 7: Yangibana Re-Estimated Mineral Resource

Yangibana	M Tonnes	%TREO	$\%Nd_2O_3+Pr_6O_{11}$
Indicated	1.53	0.90	0.43
Inferred	0.42	0.80	0.39
TOTAL	***1.95***	***0.88***	***0.42***

Yangibana M09/165 100% Hastings

Indicated	1.42	0.91	0.43
Inferred	0.36	0.79	0.38
TOTAL	***1.78***	***0.89***	***0.42***

Yangibana M09/163 (JV Tenement 70% of Total to Hastings)

Indicated	0.11	0.78	0.39
Inferred	0.05	0.85	0.42
TOTAL	***0.16***	***0.80***	***0.40***

Table 8: Yangibana North Re-Estimated Mineral Resource

Yangibana North	M Tonnes	%TREO	$\%Nd_2O_3+Pr_6O_{11}$
Measured	0.66	1.39	0.36
Indicated	4.15	1.41	0.36
Inferred	0.97	1.43	0.37
TOTAL	***5.78***	***1.41***	***0.36***

Yangibana North M09/160 100% Hastings

Measured	0.29	1.35	0.35
Indicated	1.66	1.43	0.37
Inferred	0.60	1.43	0.37
TOTAL	**2.55**	***1.42***	***0.37***

Yangibana North M09/159 (JV Tenement 70% of Total to Hastings)

Measured	0.38	1.42	0.36
Indicated	2.49	1.40	0.36
Inferred	0.37	1.45	0.37
TOTAL	***3.24***	***1.41***	***0.36***

Of the total resources at Yangibana, 1.78 million tonnes are within Mining Lease 09/165 held 100% by Hastings and 1.60 million tonnes are within Mining Lease 09/163 in which Hastings holds a 70% interest.

Yangibana North lies within Mining Lease 09/160 held 100% by Hastings. The mineralisation is continuous and extends into Mining Lease 09/159, in which Hastings holds a 70% interest, as Yangibana North.

Of the total resources at Yangibana North, 2.55 million tonnes are within Mining Lease 09/160 held 100% by Hastings and 3.24 million tonnes are within Mining Lease 09/159 in which Hastings holds a 70% interest.

Mineral Resources for Simons Find, Gossan, Lions Ear and Kane's Gossan are not utilised in the reserve calculation and are unchanged from the previous resource estimate, they are shown here for the sake of clarity only.

Mineral Resources at Simon's Find are shown in Table 9. These resources are located within Mining Lease 09/158 and Exploration Licence 09/1943, both held 100% by Hastings.

Table 9: Simon's Find Mineral Resource, 100% Hastings

Simons Find	M Tonnes	%TREO	%Nd_2O_3+Pr_6O_{11}
Indicated	0.45	0.64	0.35
Inferred	0.86	0.67	0.35
TOTAL	***1.31***	***0.66***	***0.35***

Table 10: Mineral Resources not updated, 100% Hastings, all Mineral Resources are Inferred Only

Inferred	Tonnes	%TREO	%Nd_2O_3+Pr_6O_{11}
Gossan	0.25	1.43	0.35
Lion's Ear	0.71	1.54	0.39
Hook	0.29	1.52	0.33
Kane's Gossan	0.57	1.04	0.29
TOTAL	***1.82***	***1.36***	***0.34***

JORC Inferred Mineral Resources at Gossan, Lion's Ear, Hook and Kane's Gossan are shown in Table 10. These deposits are all within Mining Lease 09/159 in which Hastings holds a 70% interest.

HASTINGS
Technology Metals Limited

Ore Reserve Estimates

The Ore Reserve estimate is derived from the Measured and Indicated ore tonnes from the Mineral Resource estimates undertaken for the Bald Hill, Frasers, Auer, Yangibana and Yangibana deposits. Only the Measured and Indicated Blocks from the Mineral Resources were converted to an Ore Reserve using Whittle 4D software which generated optimised pit shells defining economic envelopes based on various modifying factors, geotechnical domains, operational costs and sales pricing. The optimised pit shells were used as the basis for detailed open pit designs and subsequent mine scheduling which maximised NPV.

Operational costs were built up from existing testwork results completed during the Definitive Feasibility Study, mining contractor rates sourced from tender evaluations and market commissioned reports for salaries and sales pricing.

The mining schedule and operational costs were then evaluated in a financial model built by KFW-Ipex Bank which resulted in an NPV of A$549M and other financial metrics as listed in Table 15 below. The table discusses the relevant Modifying Factors in accordance with JORC 2012 standards.

Mining Plan

Mining will be undertaken at the Yangibana Project by a mining contractor utilising a standard truck and shovel arrangement. Ore and waste will be mined by conventional drill and blast and load and haul practices, mined on discrete flitches at bench heights dependant on the material type (ore or waste) and ore body geometry.

Close spaced Grade control drilling will be undertaken ahead of mining on a campaign basis by angled RC drilling at drill spacings deemed appropriate for the orebody being mined.

The deposits considered in this new mining plan have different degrees of weathering with each of the deposits hosted by:

- An upper horizon comprising saprolite that does not require blasting,
- A transition zone of decreasing alteration that will require blasting, and
- Deeper, fresh granite that will require blasting.

The deposits occur in a range of dips as shown in Table 11, with Fraser's having the most extreme variation from 5^{o} towards its north-eastern end to 65^{o} at its south-western end.

Average true thickness varies from 2.2m to 3.5m throughout the Ore Reserve deposits although locally true thicknesses in excess of 20m occur.

Table 11: Basic dimensions of the Yangibana deposits hosting Ore Reserves

Deposit	Declination (degs)	Ave true thickness (m)
Bald Hill	10 to 60	3.5
Fraser's	5 to 65	3.3
Auer	60 to 80	3.2
Auer North	65 to 85	3.5
Yangibana	30 to 65	2.2
Yangibana West	10 to 35	2.9
Yangibana North	5 to 20	3.2

The processing plant and associated facilities will be run and operated by Hastings personnel. Additional facilities such as the power station and pipeline will most likely be operated by specialist 3rd party providers.

Cut-Off Parameters

A cut-off grade of 0.18% TREO has been used to interpret the mineralisation of potential economic interest with neodymium (Nd) and praseodymium (Pr) being the most important sources of potential revenue from the project. The cut-off coincides generally with the visual ore/waste geological contact of the deposits, with target minerals being hosted predominantly by ironstone, and to a much lesser extent by phoscorite or carbonate.

The economic cut-off grade for the Ore Reserves was determined on a block by block value basis and is dependent on the recoverable grade and distribution of oxide elements contained. Blocks with revenue from recoverable metal greater than the sum of the processing and selling costs (weighted average A$110/t ore) were determined to be above the cut-off for processing and included as ore in the optimisation process.

Mining Factors

Mining Recovery and Dilution

The ironstone unit that hosts the bulk of the rare earths is visually distinct from the host rock providing good visual control for ore identification. RC grade control drilling will be carried out prior to mining to clearly delineate the mining boundaries of the blocks containing economic rare earths against blocks containing uneconomic waste material.

Blasting and mining near and in the ore zones is planned to minimise dilution and allow removal of the hanging-wall waste to expose and selectively mine the ore. Due to the high value of the ore, a high ore recovery is the focus of mining. As such, the recent Mineral Resource update has expanded the geological wireframes out to the edge of mineralisation defined by a 0.18% TREO cut-off, as compared to a 0.2%Nd_2O_3+Pr_6O_{11} used previously. This effectively lowers or dilutes the tonnes and grade to be mined. On this basis no additional dilution has been factored into the optimisation and Ore Reserve reporting. A 2% ore loss was also applied to each deposit.

Geotechnical

Based on the geotechnical report provided by Snowdens Consultants in 2019 (Geotechnical Feasibility Study Project Number AU10083 August 2019) the pit optimisations incorporated a conservative 28^{o} overall wall angle in the saprolite, and 35-40^{o} in the weathered and fresh granite. Due to the relatively shallow nature of the pits and very competent waste domains, geotechnical issues are considered to be a relatively low risk to the operation.

Ground Water

Ground water at all deposits sits at approximately 45m below the natural surface level. Pits will be dewatered ahead of mining using bores or by in-pit pumping from sumps to dedicated temporary storage facilities at the pit edge. Stormwater will be managed in-pit using sumps pumped externally to the pit.

Waste Material

Waste from each pit will be stored in adjacent waste storage dumps. A portion of the Bald Hill pit is likely to be backfilled to minimise haulage distances. All waste is considered non-reactive and not considered to pose an Acid Rock Drainage (ARD) issue and therefore will not require additional treatment or contained dumping strategies.

Ore Material

Ore is transferred either directly to the Run-Of-Mine (ROM) pad or to low-grade stockpiles by mining trucks. For pits remote from the plant the long hauls are achieved by road trains.

Optimisation Parameters

Pit optimisations were completed using the Whittle optimisation software to determine the economic mining limits for each deposit. Only Measured and Indicated Resources were considered for processing and all Inferred material is considered to have no economic value in this process.

Economic pits were then designed in stages to enable the required ore tonnages and grades and waste volumes to be optimised based on plant requirements.

Pit optimisation studies and designs have defined the total Probable Ore Reserves for the Yangibana Project as shown in Table 12. (Note that rounding discrepancies may appear in the following tables.)

Table 12: Total Probable Ore Reserves

Deposit	M Tonnes	%TREO	%Nd_2O_3+Pr_6O_{11}	Nd_2O_3+Pr_6O_{11} as % of TREO
Bald Hill	4.97	1.03	0.41	40
Fraser's	0.90	1.51	0.64	42
Auer	1.50	0.95	0.33	35
Yangibana	1.36	0.91	0.44	48
Yangibana North	3.46	1.39	0.37	26
TOTAL	***12.20***	***1.13***	***0.40***	***37***

Probable Ore Reserves within tenements held 100% by Hastings are shown in Table 13 with those within tenements in which Hastings holds a 70% interest being shown in Table 14.

Table 13: Probable Ore Reserves Within Tenements Held 100% by Hastings

Deposit	M Tonnes	%TREO	%Nd_2O_3+Pr_6O_{11}	Nd_2O_3+Pr_6O_{11} as % of TREO
Bald Hill	4.97	1.03	0.41	40
Fraser's	0.90	1.51	0.64	42
Auer	1.50	0.95	0.41	35
Yangibana	1.29	0.91	0.44	48
Yangibana North	2.24	1.32	0.34	26
TOTAL	***10.91***	***1.10***	***0.41***	***38***

Table 14: Probable Ore Reserves Within JV Tenements (only 70% of reserves tabled)

Deposit	M Tonnes	%TREO	%Nd_2O_3+Pr_6O_{11}	Nd_2O_3+Pr_6O_{11} as % of TREO
Yangibana	0.07	0.78	0.39	50
Yangibana North	1.23	1.39	0.37	26
TOTAL	***1.30***	***1.36***	***0.37***	***28***

Table 13 represents the Eastern Belt Ore Reserves tonnages held 100% by Hastings and the grades of Nd_2O_3+Pr_6O_{11} and TREO. The portion of Nd_2O_3+Pr_6O_{11} calculated as a percentage of TREO is also tabled. Table 14 represents the Western Belt Ore Reserves which accounts for only 70% of the mining reserves allocated to Hastings as part of the Joint Venture in the respective tenements M 09/160 and M 09/159.

Metallurgical Factors and Assumptions

A DFS was completed in November 2017 based on the Bald Hill and Fraser's deposits and this is now progressing through detailed design. The metallurgical flowsheet developed from that study has been used as the basis for PFS-level assessments of the satellite deposits. The metallurgical performance of samples from each satellite deposit has been assessed through standard bench-scale flowsheets, with the results of the testwork, as well as impacts on operating costs being used for the prefeasibility-level study on each satellite deposit.

Process and Flowsheet

The metallurgical process comprises ore beneficiation followed by hydrometallurgical (hydromet) extraction to produce a valuable Mixed Rare Earths Carbonate (MREC) product. The beneficiation of ore includes crushing, grinding, rougher flotation, regrinding and cleaner flotation.

The hydromet processes include acid bake, water leach, impurity removal and MREC product precipitation.

The simple and effective metallurgical process flowsheet developed with the best-known available technology and industry practice by the Hastings Technical Team has been well tested in both laboratory scale and pilot scale during the Bald Hill and Fraser's DFS. The unit processes selected for inclusion in the beneficiation and hydromet flowsheet are based on known technologies, both in rare earths (RE) industries and other mining applications.

Ore Feed Chemistry Tolerances

Assessment of satellite deposit mineralogy has shown the main RE-bearing mineral in the ore is monazite, which is consistent with the DFS ore sources. The main gangue minerals are iron oxides and hydroxides, biotite and apatite. Iron carbonate (siderite) has been identified at depth in Yangibana West and Yangibana North. The siderite boundary has been mapped and higher siderite-bearing ores have been excluded from the planned mill feed ore.

The ratio of RE elements contained in the monazite differs from that of Bald Hill and Fraser's. This is reflected in the financial analysis but has no impact on the performance of the beneficiation flowsheet. Compared to DFS ore source concentrate, there may be some variation on concentrate mineralogy. This can be managed in the hydromet circuit through varying process conditions.

Testwork

Pilot plant campaigns for both the beneficiation flowsheet and the hydromet flowsheet have proved the circuits can be run on a continuous basis and that the selected unit processes are able to selectively concentrate the RE-bearing mineral monazite and remove or control the major product impurities of manganese, iron, thorium and uranium within acceptable product ranges. Over 50 kg of high-purity MREC produced from the pilot plant was sent to 11 customers for evaluation. The product quality is acceptable to separation plant operators.

Bench-scale testwork for the satellite deposits was mostly carried out in 2017 and 2018 at a number of commercial laboratories in Australia. Beneficiation testwork has been completed at KYSPY Met and ALS Metallurgy. Hydromet testwork has been completed at SGS Minerals Metallurgy and ANSTO (Australian Nuclear Science and Technology Organisation).

Assessment of metallurgical processing performance of all satellite deposits was based on batch testwork, using the standard DFS comminution and flotation flowsheet, and comparison against the performance achieved with DFS ore sources. A standard acid bake and water leach test was completed for assessment of the hydromet performance. Liquor chemistry post-water leach was used to compare against DFS ore sources. A dedicated programme to understand the impact on the precipitation circuit performance from varying levels of Manganese in the leach liquor was also undertaken.

Assessment of comminution requirements was undertaken on samples from each satellite deposit using a standard suite of comminution tests including SMC, Bond Ball Mill work index, Bond Crusher work index, and abrasion index. All results indicate that the satellite deposits are suitable for processing through the comminution circuit as designed in the DFS.

Detailed mineralogy and variability testwork have been carried out on multiple samples from each satellite deposit.

The metallurgical recovery for Bald Hill and Fraser's is 85.6% TREO recovery in the beneficiation circuit, 87.5% TREO recovery in the hydrometallurgy circuit, giving an overall metallurgical recovery of 74.9%.
The metallurgical recovery for the satellite deposits is 88.5% TREO recovery in the beneficiation circuit, 86.1% TREO recovery in the hydrometallurgy circuit, giving a project overall metallurgical recovery of 76.2%.

Environmental Factors

Ongoing environmental studies include data from the DFS, which has been updated to reflect work carried out on the satellite deposits:

- Baseline flora and fauna: Flora and fauna surveys have been conducted over 55,650 ha of tenements. No significant impact will occur to conservation significant terrestrial flora or fauna. Subterranean fauna sampling has been completed at Yangibana West and is currently underway in the Auer, Auer North and Yangibana areas.
- Baseline ground and surface water: A hydrology study has determined that mining and the majority of infrastructure falls outside flood impact zones. Water from fractured rock aquifers will meet approximately 20% of the project's water demands. The remaining 80% of water demands will be sourced from the paleochannel bore field. A pit dewatering assessment and post-closure pit lake modelling has been completed for Yangibana West and is planned to be undertaken for Auer, Auer North and Yangibana pit areas.
- Baseline soil and radiation: Topsoil analysis was conducted and mapped over all but the Yangibana area, which is planned. Baseline radiation surveys and radiation waste characterisation studies have determined that naturally occurring radioactive materials (NORM) are associated with the orebody. Additional radiation surveys are required over Auer, Auer North and Yangibana.
- Waste rock geochemical characterisation: Yangibana West pit lithologies have been characterised geochemically and classify as benign and non-acid forming. The mineralogy of the project is not associated with asbestiform minerals. Erodibility parameters were determined for waste rock and topsoil and inform the waste rock landforms' design for Yangibana West. Waste rock geochemical characterisation for Auer, Auer North and Yangibana are initiated.
- Baseline air quality: A baseline air quality assessment and greenhouse gas emissions assessment have been completed. A radiation impact assessment has determined that dust containing NORM will not pose a risk to the surrounding environment.
- Cultural heritage: No impacts to known significant heritage sites will occur as a result of implementing the project. Heritage surveys are currently underway for waste rock landform areas.

- Closure: A landform evolution study has identified landform design specifications that aim to ensure site landforms will maintain their integrity for 1,000 years post-closure. A landform evolution study will be revised if waste rock characterisation studies' findings in Auer, Auer North and Yangibana differ from those of the DFS ore sources.
- The closure plan will be updated subject to outcomes of ongoing studies.
- The mining plan has been submitted and is currently under review.
- Water abstraction license (5c) has been approved.
- Permits required and status of permits: Project Environmental approval was granted in August 2019 with conditions for additional minor flora surveys to be undertaken in early 2020 and the mining permit for Bald Hill, Frasers and Yangibana North is under current review. Referral for Auer, Auer North and Yangibana will occur under the *Environmental Protection Act (WA 1986)*.

Market Assessment

The Yangibana project will produce a Mixed Rare Earth Carbonate (MREC) that has a high neodymium (Nd) and praseodymium (Pr) content (ranging from 20 - 25% in concentrate) as the predominant value elements. It is estimated that praseodymium oxide (Pr_6O_{11}), neodymium oxide (Nd_2O_3) will contribute 85% of the economic value per kilogram of the MREC. When aggregated with terbium oxide (Tb_4O_7) and dysprosium oxide (Dy_2O_3) the value rises to 92%.

- Supply shortages is anticipated in the near future for Nd_2O_3 and Pr_6O_{11} oxides. This due to the demand growth in permanent magnets used in the manufacture of electric power trains for Electric Vehicles in the decade of the 2020s.
- A market report published in October 2019 by CRU* was independently commissioned by the expected project finance lenders being KFW-Ipex Bank (German state bank) and North Australia Infrastructure Facility (NAIF). CRU supplied non-disclosable price forecasts for RE oxides covering the period from 2020 to 2035 which were used to calculate the economic mining reserves.
- The plant has a design capacity of 15,000t of MREC per annum.
- The MREC, when further processed and separated, results in TREO of 8,500t per annum on average.

**CRU - an independent commodities research and advisory service group, headquartered in London, provides data-backed insight, analysis and forecasting in select emerging minerals commodities such as the rare earths industry. The company monitors key industry and market developments to support its price forecasting.*

Hastings has previously announced a total of five offtake memorandums of understanding (MOUs) entered into between July 2017 and June 2019. A contract was signed with Baotou Sky Rock Rare Earth in November 2018 for 2,500t of MREC a year for 5 years. Two other Chinese MOUs with Qiandong Rare Earth Group and China Rare Earth Holdings Limited have lapsed. The MOU with Schaeffler AG for 5,000t per annum for 10 years which is pivotal in the German UFK (untied loan guarantee scheme) project finance loan negotiations are actively under contract negotiations. The MOU with Thyssenkrupp Raw Materials GmbH has been amended from 5,000t to 3,500t per annum and contract discussions are ongoing. In total, these MOUs account for approximately 11,000t of the total planned 15,000 MREC annual tonnage.

Social

Hastings is implementing a Stakeholder Engagement Plan. The overall response to the project has been positive. A Land Access Agreement has been negotiated and ratified with the pastoral lessee. A Native Title Agreement has been negotiated and ratified with the Native Title claimants as reported in the ASX announcement titled "Hastings Signs Native Title Agreement with Thiin-Mah Warriyangha, Tharrkari and Jiwarli People" dated 14 November 2017.

The workforce will be recruited from the region, and where this is not possible, such as plant operation specialists, the manpower required will be sourced from Perth.

Hastings is currently developing systems and processes to ensure it maintains its social licence to operate, to ensure its workforce are competent in their respective roles and have a culture of safety and compliance.

Infrastructure

The Yangibana project is located approximately 200 km north of Gascoyne Junction in the Upper Gascoyne region. The process plant is located on a greenfield site and all supporting infrastructure must be constructed. The proposed infrastructure for the project will include:

- Comminution plant
- Beneficiation plant
- Hydrometallurgy plant
- Access and site roads
- Water supply borefield
- Tailings storage facility (TSF) and evaporation plant
- Mining buildings
- Fuel storage
- Security and fencing
- Borefield
- Employee housing and transportation
- Water treatment and mine site sewage
- Data and communications infrastructure
- Gas Pipeline
- LNG fuelled power station.

As of December 2018, early site works include the construction of the water supply bore and pipeline, the 340-room accommodation village and the access road from the Cobra–Gifford Creek Road to the plant site. Of the above, construction has started on the bore and pipeline and off-site fabrication of the accommodation village buildings has commenced with the first deliveries to site. Designs have been completed for the site access road. Additionally, for the longest lead item, the rotary kiln, an order has been placed with FLSmidth.

Cost Assumptions

The key Ore Reserve parameters developed from the current evaluation are shown in Table 15 below.

Table 15: Ore Reserve Parameters

Study Parameters	Parameter
Status of JORC Resources used for financial evaluation	Measured and Indicated
Mining Method	Open Pits
Mining Dilution – inherent in the wireframing of the October 2019 updated MIK resource model.	variable
Mining Recovery	98%
Processing Route	Flotation, Acid Bake – Water Leach and MREC Precipitation
Overall Processing Recovery (TREO) – Ore to MREC	76.2%
Maximum Target Production Rate (Mixed Rare Earths Carbonate)	15,000 tpa
Maximum Target Contained Nd_2O_3+Pr_6O_{11}	3,400 tpa
Capital Expenditure (before contingencies)	A$517m
Operating Costs	A$21.40/kg TREO
*LOM Average Basket Price of MREC (before separation costs)	US$39.90/kg TREO
Exchange Rate US$:A$	0.71
**Discount Rate (ie. weighted average cost of capital)	6.8%

**price forecast provided by CRU*

***As calculated by KFW-Ipex Bank in the financial model*

This financial evaluation evaluates the production targets based on all deposits incorporated in the mine plan that established Probable Ore Reserve of 12.20 million tonnes.

A summary of the Mineral Resources of the deposits included in this evaluation and their utilisation as Probable Reserves in the financial evaluation is provided in Table 16.

Operating costs

This summary excludes any costs incurred by the third-party participant in the Yangibana Joint Venture Agreement that holds a 30% interest in the relevant tenements.

A LOM contract mining cost of A$4.24/dry metric tonne or ore and waste mined is realised based on prices estimated by Snowden based upon quotations received in 2017.

Processing costs for Bald Hill and Fraser's applied in the optimisation are shown in Table 16.

Table 16: DFS Ore Reserve Parameters

OPEX	Frasers	Bald Hill	Yangibana NW	Yangibana	Auer	Auer Nth
Haulage Ore	2.00	1.00	4.00	4.00	2.50	2.50
Beneficiation	18.02	18.02	19.81	18.02	18.02	18.02
G & A	54.00	54.00	54.00	54.00	54.00	54.00
Hydromet	45.70	28.95	48.39	32.46	31.15	31.65
Corporate	3.29	3.29	3.29	3.29	3.29	3.29
Total $/t Ore	***123.01***	***105.26***	***129.49***	***111.77***	***108.96***	***109.46***

*Total Ore costs as $/t ROM

Selling costs included a state royalty cost of 2.5% and a native title royalty of 0.7% for all rare earths and niobium mined for the life of mine. Additionally, a separation charge (inclusive of impurity removal) of A$3.87/TREO in carbonate was applied, based on industry benchmarking. For modelling purposes, this cost was applied to each RE oxide separately. A transport cost of $147.88 per tonne of MREC produced was also applied.

The project will provide a MREC product for sale and the separated oxide prices used for the economic evaluation are from CRU price forecasts. In the financial model annual year-on-year forecast prices is applied to the individual RE oxide elements.

For the optimisation component, pricing was averaged over two 6-year periods, the first period pricing regime was applied to the Bald Hill and Frasers optimisations while the latter 6-year period was used for Auer, Yangibana and Yangibana North optimisations.

The annual MREC production volume (as TREO kg's) is calculated through the application of beneficiation and hydrometallurgy elemental recovery factors (derived from pilot plant and laboratory testing) to a monthly mining schedule.

The MREC revenue is calculated as:

TREO Basket Price minus Customer Separation Quote minus Customer Impurity Removal Charges = MREC Product Price

Revenue Factors

The financial model assumes an average long-term US$/A$ exchange rate of 0.71 and uses CRU price forecasts for rare earths prices for the period 2020 to 2035. Financial evaluation of the Probable Ore Reserves resulted in the following economic outcomes as set out in Table 17 below.

Table 17: Financial Evaluation Results

Operating Life	13.0 years
Net Present Value (NPV)	A$549 M
Internal Rate of Return (IRR)	21.1%
Payback Period	3.4 years

The economic model assumes Mojito Resources will participate in the development and mining of the deposits held 70% by Hastings in joint venture with Mojito Resources (30%) under the 'Yangibana Joint Venture Agreement'. As set out in Table 14, the specific deposits to which the joint venture applies are Yangibana and Yangibana North. If there is development of the mine by the joint venture, not only will there need to be a Mining Joint Venture Agreement agreed and put in place to replace the existing joint venture documentation and regulate the arrangements between the participants for the mine development, but arrangements will also need to be established to determine how the Yangibana production and tenements, the subject of the joint venture, fit with the broader 100% Hastings group owned production and tenements. No costs or revenue ascribed to the 30% interest in the deposits held by Mojito Resources are reported in the financial modelling. If Mojito Resources did not participate in any future development of the joint venture deposits and the development of those deposits were to proceed on a 100% basis by Hastings, then the economic model would need to be updated to allocate those costs and resulting revenue to Hastings.

Production Targets

The current Ore Reserve Statement has ore reserve estimates resulting from the design of several open pits that will produce MREC over the current life of the project.

In this Ore Reserve Statement;

- Probable Ore Reserves are derived from Measured and Indicated Mineral Resources.
- No Inferred Mineral Resources are included in the Ore Reserves.

The Ore Reserves classifications are considered appropriate because;

- All the pits are well drilled and geologically understood.
- Extensive metallurgical test work and the results of two phases of pilot plant testwork support the estimation.

Capital and Operating costs are derived by independent third-party industry recognised specialists. The current Capex of $512M is an update from the previous capital estimate of $427M in the ASX release dated 13 March 2019. It now includes previously excluded infrastructure spend for a gas pipeline, powerstation, access road upgrade and increased ICT development which are seen to have distinct benefits to the public and the Gascoyne community (based on a Costs Benefit Analysis study by Ernst and Young as required for infrastructure related loan facility from NAIF).

Operating costs reflect the mining and infrastructure setup costs of all pits within the mining schedule. Additionally, over the life of the project a $17M allowance has been made in the operating cost for miscellaneous mining items for all the open pits within the mining schedule, including;

- Clearing and grubbing;
- Topsoil to stockpiles;
- Haul Road formation;
- Haul Road earthworks cut and fill
- Culvert construction
- Construction of settling ponds; and
- Construction of drainage ponds.

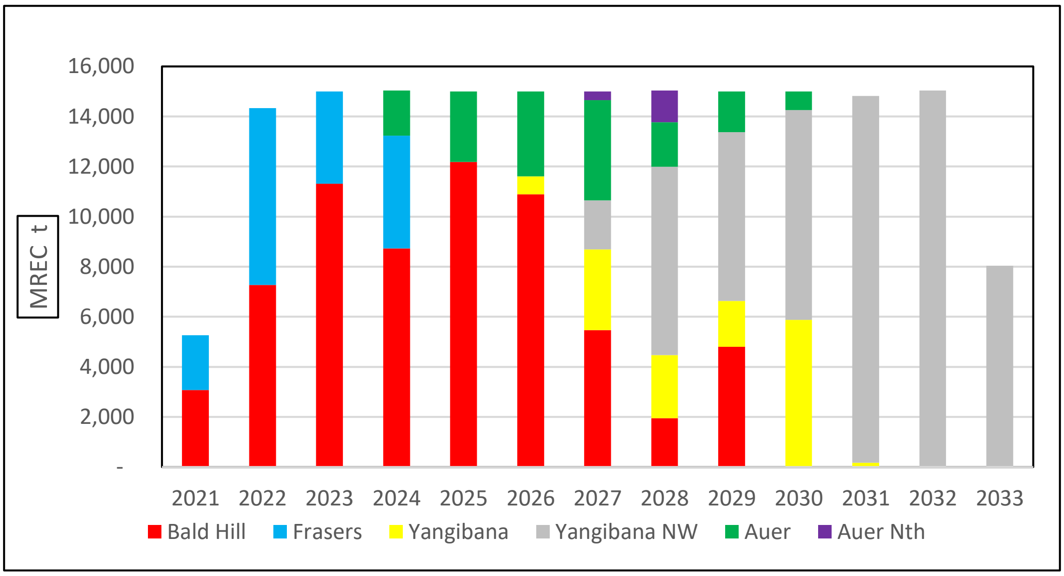

Figure 2 - Annualised MREC Production Targets by Deposit

Current production targets on an annualised basis are listed in Figure 2 above to produce up to 15,000 tpa of MREC. The MREC will contain up to 8,500 tpa Total Rare Earths Oxides, of which up to 3,400 tpa will be neodymium oxide (Nd_2O_3) + praseodymium oxide (Pr_6O_{11}).

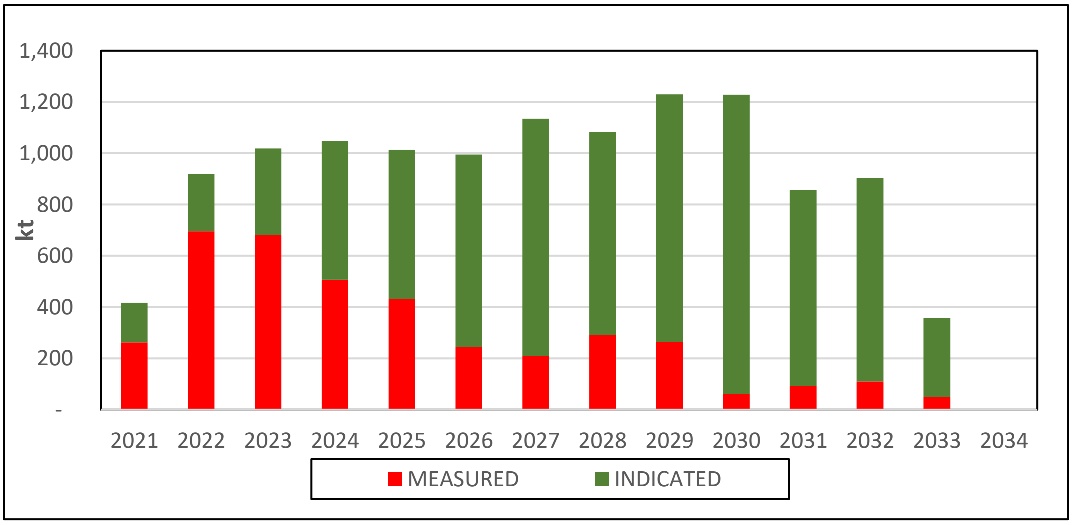

Figure 3 - Mining by Mineral Resource Category

Figure 3 shows the various resource category tonnages to be mined on an annualised basis.

100% of the Probable Ore Reserves are derived from Measured and Indicated Mineral Resources only.

Audits and Reviews

All aspects of the project including the resources and reserves have been reviewed extensively by Behre Dolbear Australia (BDA), the Independent Technical Experts appointed by the Project's debt providers.

Relative Accuracy/Confidence

The estimates in this study relating to mining, processing and cost performance are underpinned by an updated DFS that has a confidence range of +15%/ -10%.

Competent Person Statements

The information in this announcement that relates to Mineral Resources is based on information compiled by David Princep. Mr. Princep is an independent consultant to the Company and a member of the Australasian Institute of Mining and Metallurgy (AusIMM). Mr Princep has sufficient experience relevant to the styles of mineralisation and types of deposits which are covered in this announcement and to the activity which they are undertaking to qualify as a Competent Person as defined in the 2012 edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' ("JORC Code").

The information in this announcement that relates to the Ore Reserves at Bald Hill, Fraser's, Auer, Auer North, Yangibana, Yangibana West and Yangibana North is based on information reviewed or work undertaken by Mr. Stephen O'Grady, member of the Australasian Institute of Mining and Metallurgy, and a Director of Intermine Engineering Consultants. Mr O'Grady has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the preparation of mining studies to qualify as a Competent Person as defined by the JORC Code 2012. Mr O'Grady consents to the inclusion in this announcement of the matters based on his information in the form and context in which it appears.

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. 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.

TERMINOLOGY USED IN THIS REPORT

Total Rare Earths Oxides, TREO, is the sum of the oxides of the light rare earth elements lanthanum (La), cerium (Ce), praseodymium (Pr), neodymium (Nd), and samarium (Sm) and the heavy rare earth elements europium (Eu), gadolinium (Gd), terbium (Tb), dysprosium (Dy), holmium (Ho), erbium (Er), thulium (Tm), ytterbium (Yb), lutetium (Lu), and yttrium (Y).

About Hastings Technology Metals

Yangibana Project

Hastings Technology Metals Limited (ASX:HAS, Hastings or the Company) is advancing its Yangibana Rare Earths Project in the Upper Gascoyne Region of Western Australia towards production. The proposed beneficiation and hydro metallurgy processing plant will treat rare earths deposits, predominantly monazite, hosting high neodymium and praseodymium contents to produce a mixed rare earths carbonate that will be further refined into individual rare earth oxides at processing plants overseas.

Neodymium and praseodymium are vital components in the manufacture of permanent magnets which is used in a wide and expanding range of advanced and high-tech products including electric vehicles, wind turbines, robotics, medical applications and others. Hastings aims to become the next significant producer of neodymium and praseodymium outside of China.

Hastings holds 100% interest in the most significant deposits within the overall project, and 70% interest in additional deposits that will be developed at a later date, all held under Mining Leases. Numerous prospects have been identified warranting detailed exploration to further extend the life of the project.

Brockman Project

The Brockman deposit, near Halls Creek in Western Australia, contains JORC Indicated and Inferred Mineral Resources, estimated using the guidelines of JORC Code (2012 Edition).

The Company is also progressing a Mining Lease application over the Brockman Rare Earths and Rare Metals Project.

Hastings aims to capitalise on the strong demand for critical rare earths created by the expanding demand for new technology products.

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

For further information please contact:

Charles Lew, Chairman: +65 6220 9220 / +61 8 6117 6118
Andrew Reid, Chief Operations Officer, +61 432 740 975

JORC Code, 2012 Edition – Table 1

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 (e.g. 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 (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases, more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (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. Eight drilling programmes have been completed to date with more than 1,500 holes drilled for 80,000m. • 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. • RC and diamond drilling leading to the establishment of JORC Resources has been carried out at Bald Hill, Frasers's, Yangibana West, Auer, Auer North, and Yangibana, within tenements held 100% by Hastings, and at Yangibana North 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. • 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.* *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.*	• Recoveries are recorded by the geologist in the field at the time of drilling/logging. • If poor sample recovery is encountered during drilling, the geologist and driller have endeavoured to rectify the problem to ensure maximum sample recovery. Visual assessment is made for moisture and contamination. A cyclone and splitter were used to ensure representative samples and were routinely cleaned. • Sample recoveries to date have generally been reasonable, and moisture in samples minimal. Insufficient data is available at present to determine if a relationship exists between recovery and grade.
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.*	• 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. • All samples were split using the system described above to maximise and maintain consistent representivity. Most samples were dry. For wet

Criteria	JORC Code explanation	Commentary
	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.*	samples the cleanliness of the cyclone and splitter was constantly monitored by the geologist and maintained to avoid contamination. • Bulk samples were placed in green plastic bags, with the sub-samples collected placed in calico sample bags. • 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. • A sample size of 2-4kg was collected and considered appropriate and representative for the grain size and style of mineralisation.
Quality of assay data and laboratory tests	*The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.* *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.*	• 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 • 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.
Verification of sampling and assaying	*The verification of significant intersections by either independent or alternative company personnel.* *The use of twinned holes.* *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.* *Discuss any adjustment to assay data.*	• At least two company personnel verify all significant intersections. • 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. • 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 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. Drillhole collar positions from 2015 onwards were collected using a Trimble RTX R1 GNSS receiver, with accuracy of approximately 50cm. • Elevation data was recorded by both MHR Surveyors and the Trimble receiver, but the topographic control for all drillholes is based on the high-resolution DTM undertaken by the Company, with Relative Level (RL) assigned to each borehole based on the DTM using Mapinfo Discover 3D. • 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 recent 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

Criteria	JORC Code explanation	Commentary
		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. • 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 recent programme are vertical (subject to access to the preferred collar position) or collared at -60º or -70º in steeper mineralised areas such as Auer and Auer North.
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: • Hastings Technology Metals Ltd • Address of laboratory • Sample range • 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 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 partially completed. Additional umpire sampling is underway. 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.* *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. • 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.*	• Not applicable as no exploration results are being announced
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.*	• Not applicable as no exploration results are being announced

Criteria	JORC Code explanation	Commentary
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').*	• 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.*	• Appropriate maps and sections are available in the body of this ASX 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 avoiding 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).* *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	• 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 Company's various remote sensing surveys, and conceptual as yet untested targets at depth.

Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

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.* *Data validation procedures used.*	• Data was provided as a validated Access Database and was digitally imported into Micromine Mining software. Micromine validation routines were run to confirm validity of all data. • Individual drill logs from site have been previously checked with the electronic database on a random basis to check for validity. • Analytical results have all been electronically merged to avoid any transcription errors.
Site visits	*Comment on any site visits undertaken by the Competent Person and the outcome of those visits.* *If no site visits have been undertaken indicate why this is the case.*	• The Competent Person for the updated and re-estimated Mineral Resources has not yet visited the project area. The Mineral Resource estimate detailed in the announcement was undertaken as a confirmation of the Mineral Resource estimate used in the DFS and there was insufficient time to carry out a site visit. It is expected that a site visit will be undertaken in due course. Mr Lyn Widenbar who completed the Mineral Resources that were not updated was the Competent Person who visited site from 15-16th December 2016 and reviewed geology, drilling etc.
Geological interpretation	*Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.* *Nature of the data used and of any assumptions made.* *The effect, if any, of alternative interpretations on Mineral Resource estimation.* *The use of geology in guiding and controlling Mineral Resource estimation.* *The factors affecting continuity both of grade and geology.*	• Confidence in the geological interpretation is considered to be high. • Detailed geological logging and surface mapping allows extrapolation of drill intersections between adjacent sections. • Alternative interpretations would result in similar tonnage and grade estimation techniques. • Geological boundaries are determined by the spatial locations of the various mineralised structures. • Continuous ironstone units comprising iron oxides and hydroxides, minor quartz rich zones, and locally carbonate and apatite host the rare earths mineralisation and are the key factors providing continuity of geology and grade. The mineralised zones may be described as visually distinctive anastomosing iron rich veins with excellent strike and down dip continuity.
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.*	• Bald Hill mineralisation dips shallowly (maximum 30°) but variably to the southwest and ranges from 1m to 10m thick. Maximum depth of the resource is to a vertical depth of 80 metres below surface. • Fraser's mineralisation dips steeply (70-80°) in the western portion becoming shallower (to 30°) in the east and ranges from 1m to 6m thick. Maximum depth of the resource is to a vertical depth of 140 metres below surface. • Yangibana West mineralisation dips shallowly (maximum 30°) but variably to the south and ranges from 1m to 5m thick. Maximum depth of the resource is to a vertical depth of 100 metres below surface. • Auer has three discontinuous, steeply dipping zones of mineralisation extending North-South over a total strike length of approximately 3.5 km and to a depth of 150m below surface, and a fourth zone that strikes north-easterly. • Auer North comprises three steeply dipping zones over a combined strike length of 700m and has been tested to 120m below surface at the better mineralized Zone 1.

HASTINGS
Technology Metals Limited

Criteria	JORC Code explanation	Commentary
		• Yangibana North mineralisation dips shallowly (maximum 30º) but variably to the south and ranges from 1m to 5m thick. Maximum depth of the resource is to a vertical depth of 140 metres below surface.
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.* *The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.* *The assumptions made regarding recovery of by-products.* *Estimation of deleterious elements or other non-grade variables of economic significance (eg sulphur for acid mine drainage characterisation).* *In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.* *Any assumptions behind modelling of selective mining units.* *Any assumptions about correlation between variables.* *Description of how the geological interpretation was used to control the resource estimates.* *Discussion of basis for using or not using grade cutting or capping.* *The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.*	• As the Mineral Resource estimate was initiated as a check on the previous ordinary kriged (OK) estimate a different technique was employed. In the instance a Multi-Indicator Kriging (MIK) techniques were used in order to derive an estimate that more closely honoured the underlying sample populations. • The MIK parameters used were a primary block size of 10m x 10m x 5m and an escalating search starting at 25m and increasing to 100m radius. Search directions were orientated to align with the main directions within the mineralised wireframes. • Data analysis was conducted in order to derive element correlations to enable a reduction in the number of variogrammes required within the estimation process. Elements with correlations >0.9 were grouped together, in the majority of instances this resulted in 2-3 groups with an additional 2-3 elements which were not well correlated. • In general, variography was performed on TREO_% or Nd2O3+ Pr6O11_%, HREO_ppm, Yb2O3_ppm, ThO2_ppm and U3O8_ppm dependent on the deposit in question. Additional elements Er2O3_ppm, Lu2O3_ppm, Tm2O3_ppm and Y2O3_ppm was also included as required. • Given the need to combine all of the estimates together the e-Type estimate was selected from within the results and values were reported as block average grade within the mineralised wireframe. • Whilst selective mining units were defined within the MIK modelling process, the use of the e-Type estimate does not imply that these were used to define the final estimated outcome. • Estimation has been carried out for the following variables : CeO2_ppm, Dy2O3_ppm, Er2O3_ppm, Eu2O3_ppm, Gd2O3_ppm, Ho2O3_ppm, La2O3_ppm, Lu2O3_ppm, Nd2O3_ppm, Pr6O11_ppm, Sm2O3_ppm, Tb4O7_ppm, Tm2O3_ppm, Y2O3_ppm, Yb2O3_ppm, ThO2_ppm, U3O8_ppm, LREO_ppm, HREO_ppm,TREO_% and Nd2O3+Pr6O11_% • Drill hole spacing is variable, and the block sizes were chosen to reflect the best compromise between spacing and the necessity to define the geological detail of each deposit. In general, block sizes are 10 m along strike, 10m across strike and 5m vertically. • As the estimate used MIK no capping has been applied. • Block model validation has been carried out by several methods, including: • Drill Hole Plan and Section Review • Model versus Data Statistics by Domain • Easting, Northing and RL swathe plots • All validation methods have produced acceptable results. • As these Mineral Resource estimates were completed as a check on the previous OK estimates and a reasonable correlation exists between the two it can be taken that the previous estimates substantially validate the updated Mineral Resource estimate given that there is no change in the underlying data.

Criteria	JORC Code explanation	Commentary
Moisture	*Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	• Tonnages are estimated on a dry basis.
Cut-off parameters	*The basis of the adopted cut-off grade(s) or quality parameters applied.*	• A nominal downhole cut-off of 0.18% TREO has been used in conjunction with logging of ironstone to define mineralised intersections. This is a departure from the previous estimate and negates the need to add an encompassing dilution skin to the previous OK estimates. For reporting purposes, a 0.2% Nd_2O_3+Pr_6O_{11} cut-off has been applied. For mining studies it is likely that an NSR cut-off will be defined.
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.*	• Mining is assumed to be by conventional open pit mining methods • It is expected that conventional ore loss and dilution would be applied to the Mineral Resource estimate as a modifying factor during pit optimisation and mine planning work.
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.*	• Beneficiation and hydrometallurgical testwork has been carried out on samples from the Eastern Belt (comprising Bald Hill, Bald Hill Southeast, Fraser's, Auer and Auer North deposits) and from Yangibana West and Yangibana North with very encouraging results. A bulk sample (12 tonnes) combining RC samples from Hastings' 2015 drilling at Bald Hill, Bald Hill Southeast and Fraser's was prepared as the Eastern Belt Master Composite (EBMC) that represents mineralisation that Hastings believes will be mined over the first 4-5 years of any operation. In 2016, Hastings undertook infill drilling at Bald Hill, Bald Hill Southeast and Fraser's deposits in order to produce a bulk (17 tonnes) sample for pilot plant testing. • Test work to date has shown that the rare earths mineralisation (largely monazite) can be upgraded readily using standard froth flotation techniques and readily available reagents. Tests are ongoing to decrease the apatite, carbonate and iron content of these concentrates as these can affect hydrometallurgical recoveries. A second composite sample from Bald Hill, Bald Hill Southeast and Fraser's has been collected during 2018 and is being utilised for further pilot plant-level testwork.
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*	• Environmental studies have been carried out on site with Stage 1 Flora and Fauna surveys and Stage 2 Flora and Fauna surveys completed. No environmental issues have been identified. • Subterranean fauna studies have located both troglofaunal and stygofauna, but no unique or endangered species have been encountered.

Criteria	JORC Code explanation	Commentary
	explanation of the environmental assumptions made.	
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.* *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.* *Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.*	• Bulk density/specific gravity have been measured by the Company on core from Yangibana North, and at independent laboratories on core from Bald Hill, Bald Hill South, Fraser's, Yangibana, Auer, Auer North and Yangibana West. Samples have been taken from each of oxidised, partially oxidised and fresh mineralisation with results feeding into the resource estimations. • Bulk density/specific gravity measurements have also been carried out at an independent laboratory on samples of oxidised, partially oxidised and fresh host rock, granite. • In situ bulk densities for the individual deposits have ranged from 2.30 to 2.80 tonnes per cubic metre and have been assigned into the models based on weathering surfaces and assigned rock types.
Classification	*The basis for the classification of the Mineral Resources into varying confidence categories.* *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).* *Whether the result appropriately reflects the Competent Person's view of the deposit.*	• The Mineral Resource has been classified in the Measured, Indicated and Inferred categories, in accordance with the 2012 Australasian Code for Reporting of Mineral Resources and Ore Reserves (JORC Code). A range of criteria has been considered in determining this classification including: • Geological and grade continuity • Data quality. • Drill hole spacing. • Modelling technique and kriging output parameters. • The Competent Person is in agreement with this classification of the resource.
Audits or reviews	*The results of any audits or reviews of Mineral Resource estimates.*	• A review of both the updated and previous Mineral Resource estimates has been completed as part of the DFS financing process and the updated Mineral Resource estimate incorporates feedback from the review.
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.* *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.* *These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	• The relative accuracy of the various resource estimates is reflected in the JORC resource categories. • At the Measured and Indicated Resource classification level, the resources represent local estimates that can be used for further mining studies. • Inferred Resources are considered global in nature.

Section 4 Estimation and Reporting of Ore Reserves

(Criteria listed in section 1, and where relevant in sections 2 and 3 also apply to this section.)

Item	Comments
Mineral Resource for conversion to Mineral Reserves	The resource models used for mine planning were: • Bald Hill – bm_bald_hill_full_model.fbm • Fraser's – bm_frasers_full_model.fbm • Yangibana North & West – bm_yangibana_NW_full_model.fbm • Yangibana – bm_yangibana_full_model.fbm • Auer/Auer North – bm_auer_full_model_rev2.fbm Only Measured and Indicated Resources were considered for inclusion in the Ore Reserve.
Site visits	*Site visits were completed by the following Competent Persons:* *Competent Persons* – *Items* – *Date of site visit* *Stephen O'Grady* – *Mining* – *N/A* *David Princep* – *Resources* – *N/A* *Narelle Marriott* – *Metallurgy beneficiation* – *August 2016* *Robin Zhang* – *Hydrometallurgy* – *N/A* *The mining, resources and hydrometallurgy Competent Person did not visit the site and was comfortable relying on the report of staff who have visited the site.*
Study status	*The Yangibana REO Project has previously had a Definitive Feasibility Study (DFS) released in November 2017, based on the Bald Hill and Fraser's deposits only. This Ore Reserve additionally includes satellite deposits at Auer, Auer North, Yangibana, Yangibana West and Yangibana North, and includes joint venture ground. These additional satellite deposits have been assessed to a prefeasibility-level study. The satellite deposit metallurgical assessment has been completed using the process flowsheet developed for Bald Hill and Fraser's, assessing each deposit's suitability for processing through this flowsheet.* *A forward execution work programme is being developed from the DFS study.* *Some environmental assessments are ongoing; initial results indicate there are currently no encumbrances to the project from the environmental assessments.*
Cut-off parameters	*The cut-off grade for the project was determined based on calculating revenue from recovered metal, selling and processing costs on a block-by-block (diluted) basis (parameters are below). Blocks with revenue greater than the sum of the processing and selling costs (approximately $110/t ore) were above the cut-off for processing.*
Mining factors and assumptions	*The following Modifying Factors were considered in relation to the development of the Yangibana Ore Reserves:* • *Geotechnical: For pit optimisation, a 28° overall wall angle was applied for saprolite, and 35° to 40° was applied to weathered and fresh granite. Snowdens Report - Geotechnical Feasibility Study Project Number AU10083 August 2019* • *Dilution and ore loss: Dilution has been applied in the resource model by expanding the mineralisation surfaces to incorporate the expected dilution in the hanging wall and footwall. Only a 2% ore loss factor was additionally applied to the deposits.*
Metallurgical factors and assumptions	*A DFS was completed in November 2017 on the Bald Hill and Fraser's deposits and this is now progressing to detailed design. The metallurgical flowsheet developed from that study has been used for the basis of assessment for the prefeasibility studies of the satellite deposits. The metallurgical performance of samples from each satellite deposit has been assessed through the standard bench-scale flowsheet, the results of the testwork, as well as impacts on operating costs have been used for the prefeasibility-level study on each satellite deposit.* *Process and flowsheet* *The metallurgical process comprises ore beneficiation followed by hydrometallurgical (hydromet) extraction to produce a valuable Mixed Rare Earths Carbonate (MREC) product. The beneficiation unit processes include crushing, grinding, rougher flotation, regrinding and cleaner flotation.* *The hydromet unit processes include acid bake, water leach, impurity removal and MREC product precipitation.*

Item	Comments
	The simple and effective metallurgical process flowsheet developed with the best-known available technology and industrial practice by the Hastings Technical Team, has been well tested in both laboratory scale and pilot scale during the Bald Hill and Fraser's DFS. The unit processes selected for inclusion in the beneficiation and hydromet process flowsheet are based on known technologies, both in the rare earths (RE) industries and other mining applications. *Ore feed chemistry tolerances* *Assessment of satellite deposit mineralogy has shown the main RE-bearing mineral in the ore is monazite, which is consistent with the DFS ore sources. The main gangue minerals are iron oxides and hydroxides, biotite-type minerals and apatite. Iron carbonate (siderite) has been identified at depth in Yangibana West and Yangibana North. The siderite boundary has been mapped and higher siderite-bearing portions have been excluded from the planned mill feed ore.* *The ratio of RE elements contained in the monazite differs from that of Bald Hill and Fraser's. This is reflected in the financial analysis but has no impact on the performance of the beneficiation flowsheet. Compared to DFS ore source concentrate, there may be some variation on concentrate mineralogy. This can be managed in the hydromet circuit through varying process conditions.* *Where required limits have been set for TREO and deleterious elements in the beneficiation circuit feed and these limits have been taken into account in the mine development and ore scheduling process.* *Testwork* *Pilot plant campaigns for both the beneficiation flowsheet and the hydromet flowsheet have proved the circuits can be run on a continuous basis and that the selected unit processes are able to selectively concentrate the RE-bearing mineral monazite and remove or control the major product impurities of manganese, iron, thorium and uranium within acceptable product range. Over 50 kg of high-purity MREC produced from the pilot plant was sent to 11 customers for evaluation. The product quality is acceptable to separation plant operators.* *Bench-scale testwork for the satellite deposits was mostly carried out in 2017 and 2018 at a number of commercial laboratories in Australia. Beneficiation testwork has been completed at KYSPY Met and ALS Metallurgy. Hydromet testwork has been completed at SGS Minerals Metallurgy and ANSTO.* *Assessment of metallurgical processing performance of all satellite deposits was based on batch testwork, using the standard DFS comminution and flotation flowsheet, and comparison against the performance achieved with DFS ore sources. A standard acid bake and water leach test was completed for assessment of the hydromet performance. Liquor chemistry post-water leach was used to compare against DFS ore sources. A dedicated programme to understand the impact on precipitation circuit performance from varying levels of Mn in the leach liquor was also undertaken.* *Assessment of comminution requirements was undertaken using a standard suite of comminution tests including SMC, Bond Ball Mill work index, Bond Crusher work index, and abrasion index.*

Deposit	*No. of comminution samples Completed*
Bald Hill	*8*
Fraser's	*5*
Auer	*4*
Auer North	*4*
Yangibana	*5*
Yangibana West	*3*
Yangibana North	*1*

All results indicate that the satellite deposits are suitable for processing through the comminution circuit as designed in the DFS.

<table>
<tr><th>Item</th><th>Comments</th></tr>
<tr><td>Metallurgical factors and assumptions (cont'd)</td><td>
Detailed mineralogy and variability testwork have been carried out on multiple samples for each deposit, as shown below.
<table>
<tr><th rowspan="2">Deposit</th><th colspan="3">No. of samples</th></tr>
<tr><th>Mineralogy</th><th>Variability</th><th>Composite</th></tr>
<tr><td>Bald Hill</td><td>10</td><td>8</td><td>2</td></tr>
<tr><td>Fraser's</td><td>5</td><td>5</td><td>2</td></tr>
<tr><td>Auer</td><td>18</td><td>18</td><td>1</td></tr>
<tr><td>Auer North</td><td>8</td><td>8</td><td>1</td></tr>
<tr><td>Yangibana</td><td>12</td><td>12</td><td>2</td></tr>
<tr><td>Yangibana West</td><td>6</td><td>2</td><td rowspan="2">3</td></tr>
<tr><td>Yangibana North</td><td>8</td><td>4</td></tr>
</table>
Overall Metallurgical recovery
The metallurgical recovery for Bald Hill and Fraser's is 85.6% TREO recovery in the beneficiation circuit, 87.5% TREO recovery in the hydrometallurgy circuit, giving an overall metallurgical recovery of 74.9%.
The metallurgical recovery for the satellite deposits is 88.5% TREO recovery in the beneficiation circuit, 86.1% TREO recovery in the hydrometallurgy circuit, giving an overall metallurgical recovery of 76.2%.
</td></tr>
<tr><td>Environmental</td><td>
This feasibility study (FS) was updated for the Environmental and Social Baseline section and includes data from the 2017 prefeasibility study (DFS), but has been updated to reflect:

Baseline flora and fauna: Flora and fauna surveys have been conducted over 55,650 Ha of tenements. No significant impact will occur to conservation significant terrestrial flora or fauna. Subterranean fauna sampling has been completed at Yangibana West and is currently underway in the Auer, Auer North and Yangibana areas.
Baseline ground and surface water: A hydrology study has determined that mining and the majority of infrastructure falls outside flood impact zones. Water from fractured rock aquifers will meet approximately 20% of the project's water demands. The remaining 80% of water demands will be sourced from the paleochannel borefield. A pit dewatering assessment and post-closure pit lake modelling has been completed for Yangibana West and is planned to be undertaken for Auer, Auer North and Yangibana pit areas.
Baseline soil and radiation: Topsoil analysis was conducted and mapped over all but the Yangibana area, which is planned. Baseline radiation surveys and radiation waste characterisation studies have determined that naturally occurring radioactive materials (NORM) are associated with the orebody. Additional radiation surveys are required over Auer, Auer North and Yangibana.
Waste rock geochemical characterisation: Yangibana West pit lithologies have been characterised geochemically and classify as benign and non-acid forming. The mineralogy of the project is not associated with asbestiform minerals. Erodibility parameters were determined for waste rock and topsoil and inform the waste rock landforms' design for Yangibana West. Waste rock geochemical characterisation for Auer, Auer North and Yangibana are initiated.
Baseline air quality: A baseline air quality assessment and greenhouse gas emissions assessment have been completed. A radiation impact assessment has determined that dust containing NORM will not pose a risk to the surrounding environment.
Cultural heritage: No impacts to known significant heritage sites will occur as a result of implementing the project.
Closure: A landform evolution study has identified landform design specifications that aim to ensure site landforms will maintain their integrity for 1,000 years post-closure. A landform evolution study will be revised if waste rock characterisation studies' findings in Auer, Auer North and Yangibana differ from those of the DFS ore sources. The mine closure plan has been submitted and is under review.
The mining plan has been submitted and is currently under review.
Water abstraction license (5c) has been approved
Project Environmental approval was granted in August 2019 with conditions for additional minor flora surveys to be undertaken in early 2020 and the mining permit for Bald Hill, Frasers and

</td></tr>
</table>

HASTINGS
Technology Metals Limited

Item	Comments
	Yangibana North is under current review. Referral for Auer, Auer North and Yangibana will occur under the Environmental Protection Act (WA 1986).
Infrastructure	*The Yangibana project is located approximately 200 km north of Gascoyne Junction in the Upper Gascoyne region. The process plant is located on a greenfield site and all supporting infrastructure must be constructed. The proposed infrastructure for the project will include:* • *Comminution plant* • *Beneficiation plant* • *Hydrometallurgy plant* • *Access and site roads* • *Water supply borefield* • *Tailings storage facility (TSF) and evaporation plant* • *Mining buildings* • *Fuel storage* • *Security and fencing* • *Borefield* • *Employee housing and transportation* • *Water treatment and mine site sewage* • *Data and communications infrastructure* • *Gas Pipeline* • *LNG fuelled power station.* *As of December 2018, early site works include the construction of the water supply bore and pipeline, the 340-room accommodation village and the access road from the Cobra – Gifford Creek Road to the plant site. Of the above, construction has started on the bore and pipeline and off-site fabrication and delivery to site of the accommodation village buildings. Designs have been completed for the access road. Additionally, front end engineering continues for the long lead items, such as the kiln and gas scrubber.*
Costs	*Operating costs* *This summary excludes any costs incurred by the third-party participant in the 'Yangibana Joint Venture Agreement that holds a 30% interest in the relevant tenements.* *Mining* *A contract mining cost for mining at Bald Hill and Fraser's of A\$4.12/DMT mined was estimated by Snowden based upon quotations received in 2017.* *Process* *Processing costs for Bald Hill and Fraser's applied in the optimisation are:*

	Total Ore Costs as \$/t ROM					
OPEX	*Frasers*	*Bald Hill*	*Yangibana NW*	*Yangibana*	*Auer*	*Auer Nth*
Haulage Ore	*2.00*	*1.00*	*4.00*	*4.00*	*2.50*	*2.50*
Beneficiation	*18.02*	*18.02*	*19.81*	*18.02*	*18.02*	*18.02*
G & A	*54.00*	*54.00*	*54.00*	*54.00*	*54.00*	*54.00*
Hydromet	*45.70*	*28.95*	*48.39*	*32.46*	*31.15*	*31.65*
Corporate	*3.29*	*3.29*	*3.29*	*3.29*	*3.29*	*3.29*
Total \$/t Ore	*123.01*	*105.26*	*129.49*	*111.77*	*108.96*	*109.46*

Selling costs

A state royalty charge of 2.5% was applied. No other royalties were considered for ore processed. Additionally, a separation charge (inclusive of impurity removal) of A\$3.87/TREO in carbonate was applied, based on industry benchmarking. For modelling purposes, this cost was applied to each RE oxide separately. A transport cost of \$147.88 per tonne of MREC produced was also applied.

<table>
<tr><th>Item</th><th>Comments</th></tr>
<tr><td>Costs (cont'd)</td><td></td></tr>
<tr><td>Revenue factors</td><td>The project will provide a MREC product for sale.
The separated oxide prices used for the economic evaluation are the CRU forecasts for the period 2018 to 2035. Annual year-on-year escalation was applied on an individual RE oxide basis, as supplied in the forecasts. The derived MREC basket price applied in the evaluation, using the formula stated in revenue factors, is shown below:
TREO basket price used in evaluation
<table><tr><th>Project (LOM)</th><th>2022</th><th>LOM</th></tr><tr><td>Basket Value (US$/kg TREO)</td><td>39.2</td><td>39.9</td></tr></table>The annual MREC production volume (as kg TREO) is calculated through the application of beneficiation and hydrometallurgy elemental recovery factors (derived from pilot plant and laboratory testing) to a quarterly mining schedule.
The MREC revenue is calculated as:
TREO Basket Price
minus Customer Separation Quote
minus Customer Impurity Removal Charges
= MREC Product Price
Hastings has previously announced that four offtake memorandums of understanding (MOUs) have been entered with Qiandong Rare Earth Group, China Rare Earth Holdings Limited, Thyssenkrupp Raw Materials GmbH and one MOU has progressed with the signing of an offtake contract with Baotou Sky Rock Rare Earth. In total these agreements account for approximately 11,000 t of the total planned 15,000 MREC annual tonnes.</td></tr>
<tr><td>Market assessment</td><td>The Yangibana project will produce a MREC that has a high neodymium (Nd) and praseodymium (Pr) content (up to 41% of TREO content) as the predominant value elements. It is estimated that Pr_6O_{11}, Nd_2O_3, Tb_4O_7 and Dy_2O_3 will contribute between 85% and 90% of the economic value per kilogram of production.
It is particularly in the Nd_2O_3 and Pr_6O_{11} oxides where substantial supply shortages and rapid demand growth are anticipated in the decade of the 2020s.
CRU supplied real price forecasts for RE oxides in November 2018 covering the period 2019 to 2035.
The plant will have a design capacity of 15,000 t of MREC per annum.
The plant will have a design capacity of 8,500 t per annum of TREO.
Hastings has previously announced that four offtake MOUs have been entered with customers covering approximately 11,000 t of the planned annual MREC production volume, with separated oxide prices used for MREC product pricing to be confirmed. One MOU has now progressed to signing of an offtake contract.</td></tr>
<tr><td>Economic</td><td>The economic model has been developed based on the 100% Hastings held tenements and the proportion (70%) held by Hastings, of the Joint Venture held tenements.
The economic model assumes Mojito Resources will participate in the development of the deposits held by Hastings (70%) in joint venture with Mojito Resources (30%) under the 'Yangibana Joint Venture Agreement'. As set out in Table 14, the specific deposits to which the joint venture applies are Yangibana and Yangibana North. If there is a mine development by the joint venture, not only will there need to be a Mining Joint Venture Agreement agreed and put in place to replace the existing joint venture documentation and regulate the arrangements between the participants for the mine development, but arrangements will also need to be established to determine how the Yangibana production and tenements the subject of the joint venture fit with the broader 100% Hastings group owned production and tenements. No costs or revenue ascribed to the 30% interest in the deposits held by Mojito Resources are reported in the financial modelling. If Mojito Resources did not participate in any development of the joint venture deposits and the development of those deposits was to proceed on a 100% basis by Hastings, then the economic model would need to be updated to allocate those costs and revenues to Hastings.

The key financial metrics for the Hastings share of the Yangibana Ore Reserves are IRR of 21.1% and NPV of A$549 million.
an NPV discount rate of 6.8% was used for the financial analysis.
a US$:A$ exchange rate of 0.71:1 was used for the financial analysis.</td></tr>
</table>

Item	Comments
Social	*Hastings is implementing a Stakeholder Engagement Plan. The overall response to the project has been very positive. A Land Access Agreement has been negotiated and ratified with the pastoral lessee. A Native Title Agreement has been negotiated and ratified with the Native Title claimants.* *The workforce will be recruited from the region, and where this is not possible, more broadly with most plant operations specialists sourced from Perth.* *Hastings is currently developing systems and processes to ensure it maintains its social licence to operate, to ensure its workforce are competent in their respective roles and have a culture of safety and compliance.*
Classification	*The Mineral Reserve is classified as a Probable Ore Reserve using the guidelines of the JORC Code (2012 Edition). The conversion of Measured Resources to Probable Reserves is primarily based on the need for production reconciliation of the selective ore deposit and reconciliation of the complex processing method.*
Audits or reviews	*All aspects of the project including the resources and reserves have been reviewed extensively by Behre Dolbear Australia (BDA).*
Relative accuracy/ confidence	*The estimates in this study relating to mining, processing and cost performance are underpinned by an updated FS which has a confidence range of +15%/ -10%.*