THUNDERBIRD ORE RESERVE UPDATE

HIGHLIGHTS

- **Ore Reserve updated by 6 million tonnes to 754 million tonnes @ 11.0% heavy mineral (HM)**
- **Underpins the Kimberley Mineral Sands Bankable Feasibility Study released on 24 March 2022.**

Sheffield Resources Limited ("**Sheffield**" or "**the Company**") (**ASX: SFX**) is pleased to announce an update to the Ore Reserve for the Thunderbird Mineral Sands Project (**Thunderbird** or **Project**), in the north west of Western Australia. The Ore Reserve forms the basis of the Kimberley Mineral Sands Bankable Feasibility Study (**KMS BFS**) completed by Kimberley Mineral Sands (**KMS**) and released by Sheffield on 24 March 2022. KMS is a 50/50 joint venture between Sheffield and YGH Australia Investment Pty Ltd (**Yansteel**), formed in 2021 to develop the Thunderbird Mineral Sands Project.

This Ore Reserve estimate was prepared by Entech Pty Ltd, an experienced and prominent mining engineering consultancy with appropriate mineral sands experience and industry knowledge. This Ore Reserve is based on the Thunderbird Mineral Resource estimate (refer ASX announcement of 5 July 2016) and this Mineral Resource has not changed. Measured and Indicated Mineral Resources were converted to Proved and Probable Ore Reserves respectively, subject to modifying factors, including mine designs and economic evaluation.

The Ore Reserve for Thunderbird, as at 24 March 2022, is outlined in the Table 1 below:

Table 1: Thunderbird Ore Reserve, 24 March 2022[1]

Ore Reserve			Valuable HM Grade (In-Situ)[2]					
Reserve Category	Material (Mt)	HM (%)	Zircon (%)	HiTi Leuc (%)	Leucoxene (%)	Ilmenite (%)	Oversize (%)	Slimes (%)
Proved	239	12.9	0.96	0.29	0.28	3.4	14	16
Probable	514	10.1	0.79	0.26	0.27	2.9	11	15
Total	**754**	**11.0**	**0.84**	**0.27**	**0.27**	**3.1**	**12**	**15**

Ore Reserve				Mineral Assemblage[3]					
Reserve Category	Material (Mt)	HM (Mt)	HM (%)	Zircon (%)	HiTi Leuc (%)	Leucoxene (%)	Ilmenite (%)	Oversize(%)	Slimes (%)
Proved	239	31	12.9	7.5	2.2	2.2	27	14	16
Probable	514	52	10.1	7.8	2.6	2.6	28	11	15
Total	**754**	**83**	**11.0**	7.7	2.4	2.5	28	**12**	**15**

1.Ore Reserves are presented both in terms of in-situ VHM grade, and HM mineral assemblage. Tonnes and grades have been rounded to reflect the relative accuracy and confidence level of the estimate, thus the sum of columns may not equal. Ore Reserves reported for the Dampier Project were prepared and first disclosed under the JORC Code (2012). Refer to Sheffield's ASX announcement dated 24 March 2022 titled "Thunderbird Ore Reserve Update " for further detail. Ore Reserve is reported to a design overburden surface with appropriate consideration for modifying factors, costs, mineral assemblage, process recoveries and product pricing.
2.The in-situ grade is determined by multiplying the percentage of Heavy Mineral (HM) by the percentage of each valuable heavy mineral within the heavy mineral assemblage at the mineral resource block model scale. Tonnes and grades have been rounded to reflect the relative accuracy and confidence level of the estimate, thus the sum of columns may not equal. See Appendix A for additional details.
3.Mineral Assemblage is reported as a percentage of HM Grade. It is derived by dividing the in-situ grade by the HM grade.

The Ore Reserve of 754 million tonnes at 11.0% HM contains 83 million tonnes of HM compared to the previous Ore Reserve of 748 million tonnes at 11.2% HM containing 84 million tonnes of HM. This Ore Reserve reflects changes in market product pricing, the flow sheet, product mix, ore feed blending strategy and geotechnical information and mining cost data gathered from the trial mining programs at Thunderbird. The majority of the cost estimates applied to determine the Ore Reserve have been informed by negotiated agreements or cost estimates prepared by independent third parties. In addition, binding offtake agreements account for approximately 80% of estimated Stage 1 development revenues.

The KMS BFS removes the Ilmenite Processing Circuit (IPC) which contained the Low Temperature Roast (LTR) previously included in the 2017 BFS and removes the Mineral Separation Plant (MSP) components included in both the 2017 BFS and 2019 BFS Update. The 2019 BFS Update was previously designed to produce premium zircon, zircon concentrate and primary ilmenite. The current KMS BFS flowsheet is forecast to produce a Non-Magnetic Concentrate (NMC) product containing zircon and rutile, a Paramagnetic Concentrate (PMC) being a co-product from the Non-Magnetic Finisher Circuit which contains titanium units in combination with iron oxides and low levels of monazite, and an ilmenite rich Magnetic Concentrate (MC).

The 2017 BFS previously included an Ilmenite Processing Circuit (IPC) inclusive of a low temperature roast (LTR) within the flowsheet, designed to treat the MC to produce a saleable sulfate ilmenite and two saleable co-products, being suitable feedstock for chloride slag manufacturing or as a blended feedstock for sulfate pigment production.

Yansteel have commenced construction of an ilmenite treatment facility in Tangshan, China to produce an ilmenite product suitable for chloride slag feed and feedstock for chloride pigment production. The Yansteel facility is planned to process feedstocks from various sources including Australia, Africa and China and includes both oxidizing and reducing roasts and a four-stage magnetic separation circuit to produce ilmenite products. Thunderbird MC will be sold directly to Yansteel under an arms length, binding off take agreement for processing at the Yansteel ilmenite treatment facility.

Summary of Ore Reserve Statement and Reporting Criteria

Material Assumptions and Outcomes of the Kimberley Mineral Sands Bankable Feasibility Study (KMS BFS)

The KMS BFS costs have been informed by further technical work following the formation of the Kimberley Mineral Sands joint venture in 2021. This includes:

- Two trial mining programs in late 2020 and mid-2021, which mined through a full section of the orebody and confirmed the suitability of dozer push as the ore mining method.
- Updated dozer push productivity assumptions, waste mining costs, geotechnical parameters and pit wall slope angles.
- The collection of a 25t bulk sample of ore material excavated by dozer push method.
- A 25t bulk sample metallurgical test program on the KMS BFS flowsheet, with full scale equipment or scalable equipment to produce final products and confirm process recovery assumptions.

The KMS BFS costs and modifying factors applied to the estimation process have been completed to Bankable Feasibility Study level to a ± 10% accuracy[1]. Product prices, grades, recoveries, mining parameters and costs contained in the study are used to identify economically mineable blocks to be included in the Ore Reserve estimate. The mining schedule and Ore Reserve is technically achievable, economically viable and robust and has been tested to variations in long term product pricing, operating costs and capital costs. (refer Figure 1 below).

The Project is based on a staged development strategy to reduce pre-development capital, lower construction risk and simplify and reduce operating risk by the following staged approach:

- **Stage 1:** Single Mining Unit Plant (MUP) and processing plant underpinning a 10.4Mtpa mining operation and 1,085 dry tph rougher feed rate to the wet concentration plant.
- **Stage 2:** Duplication in Year 5 of Stage 1 mining and processing circuits underpinning a 20.8 Mtpa mining operation and 2,170 dry tph rougher feed rate to the wet concentration plant.

The development strategy delivers a pre-finance and post-tax IRR of 27.5% and an NPV_8 of A$1.28 Billion

[1] Stage 2 development CAPEX is estimated to a ±25% accuracy.

over the 36 year Life of Mine and requires an initial Stage 1 development capital expenditure of A$361 million including a 10% contingency.

Table 2: Thunderbird Project Thunderbird Project Key Financial and Operating Costs Metrics

A$M, Real 2022 Prices	Stage 1 Year 1- 4	Stage 1 and 2 Year 5 - 10	LOM
Revenue	1,338	3,521	16,811
Royalties	(77)	(205)	(1,098)
Net Revenue	**1,261**	**3,316**	**15,713**
Opex:Mining	(275)	(481)	(3,267)
Opex: Processing	(148)	(410)	(2,287)
Opex: Logistics	(177)	(314)	(1,198)
Opex: Site G&A	(97)	(156)	(907)
Total	**(697)**	**(1,361)**	**(7,659)**
EBITDA	**564**	**1,954**	**8,054**
Revenue to C1 Cost Ratio[1]	**1.92**	**2.59**	**2.20**

1. Excludes royalties payable

Financial modelling has been prepared and tested by varying revenue, cost and macro-economic factors. These factors include commodity prices, operating and capital costs, production volume and ratios, along with economic discount factors. Material positive outcomes for NPV, IRR and cash flows were generated in all cases from the financial modelling. An A$/US$ exchange rate of 0.75 was assumed for the life of mine, based on consensus forecasts.

Table 3 shows targeted production volumes for Stage 1 year 1 to 4, Stage 1 & 2 years 5 to 10 and the LOM average for the Project.

Table 3: Thunderbird Project Production Assumptions

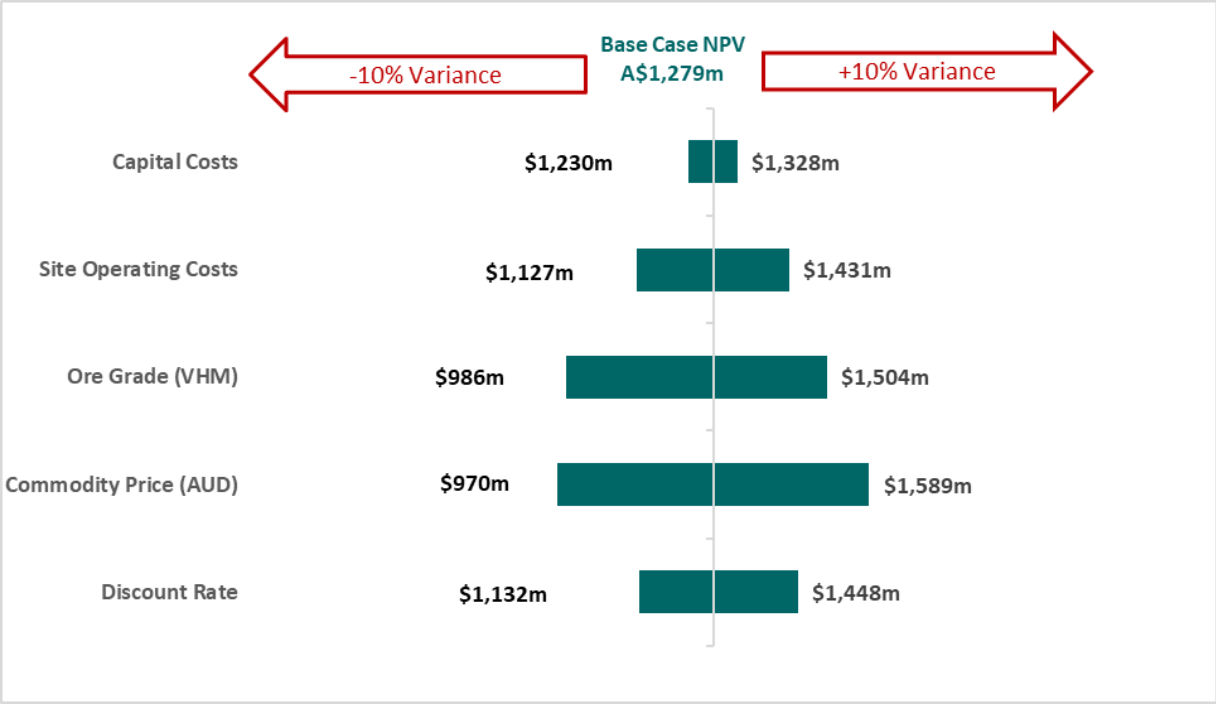
Sales Volume (Average tonnes per annum)	Stage 1 Year 1- 4	Stage 1 and 2 Year 5 - 10	LOM
Non-Magnetic Concentrate	190,000	373,000	285,000
Magnetic Concentrate	690,000	1,330,000	1,017,000
Paramagnetic Concentrate	75,000	160,000	122,000
Total	955,000	1,863,000	1,424,000

In parallel with the formation of KMS, a binding offtake agreement for 100% of the LTR Ilmenite product from Stage 1 was agreed with Yansteel. Under this agreement Yansteel also secured a first right of refusal to all LTR Ilmenite produced from Thunderbird. With the change in the flowsheet to produce a Magnetic Concentrate (MC) instead of the LTR Ilmenite, KMS has concluded a binding offtake agreement with Yansteel for 100% of MC from Stage 1 and a first right of refusal for all MC produced from Thunderbird.

KMS also has approximately 75% of the Non-Magnetic Concentrate (NMC) product under binding offtake agreements with three prominent customer groups. The committed offtake of NMC and the MC represents approximately 80% of the value of all products.

KMS has further identified value in the NMC co-product stream, being Paramagnetic Concentrate (PMC) produced during the upgrading of the NMC. This product stream has a commercially marketable level of TiO_2, ZrO_2 and a low marketable level of monazite contained within the stream. KMS is exploring potential opportunities to supply this PMC to the market. Following feedback received from potential consumer groups, the PMC contains valuable saleable mineral suitable for supply to the market, however KMS does not have binding offtake at this time.

Figure 1: Thunderbird Project Key Sensitivity Analysis



The PMC represents less than 5% of the total projected revenue across the mine life. The Paramagnetic Concentrate price is based on a TZMI long term price of US$214/t. The PMC is diluted with an inert material by a factor of 2.06 to reduce the product to below 10bq/g for shipping.

The product pricing assumptions used to determine Project economics are shown in the Table 4 and are based on TZMI short term and long-term forecast, in real dollars.

Table 4: Thunderbird Project Product Price Assumptions

Commodity Prices (US$/t, FOB)	Stage 1 Year 1- 4	Stage 1 and 2 Year 5 - 10	LOM
Non-Magnetic Concentrate	806	705	745
Magnetic Concentrate	130	120	130
Paramagnetic Concentrate (diluted)	112	105	107

TZMI have reviewed the proposed product specifications of the Thunderbird products and have verified that they will meet various market uses and typical specifications required for those markets.

Criteria used for Classification of the Ore Reserve

A Mineral Resource estimate of 3,230Mt @ 6.9% HM (including 0.57% zircon and 1.9% ilmenite) reported above a cut-off of 3.0% HM and which is classified as 510Mt Measured Category, 2,120Mt Indicated Category and 600Mt Inferred Category provides the basis of the Ore Reserve. Only Measured (510Mt, or 19%) and Indicated (2,120Mt, or 81%) Mineral Resource categories within the granted Mining Lease were considered for the Ore Reserve Estimate. Within the Mineral Resource is contained 1,050Mt @ 12.2% HM (including 0.93% zircon and 3.3% ilmenite) when reported above a cut-off of 7.5% HM. The higher cut-off contains 220Mt in the Measured Category, 640Mt Indicated Category and 180Mt Inferred Category.

The Mineral Resource estimate is based on drill hole data collected by the Company from 2012 to 2015 comprising 670 holes drilled for a total of 37,076 metres, with 24,688 samples assayed for HM, slimes and oversize. The heavy mineral assemblage dataset comprises results from 759 composite samples from 374 holes over 14,308 metres drilled, representing 63% of the total length of drill holes within mineralised zones of the Mineral Resource estimate.

The Mineral Resource estimate has been classified according to the definitions of the JORC Code (2012), into Measured, Indicated and Inferred Mineral Resources, considering data quality, data density, geological continuity, grade continuity and confidence in estimation of heavy mineral content and mineral assemblage. Table 5 shows the Mineral Resource as announced to the ASX on 5 July 2016. Sheffield confirms that it is not aware of any new information or data that materially affects the information included in the announcement to ASX on 5 July 2016 regarding the Mineral Resource estimate and that all material assumptions and technical parameters underpinning the Mineral Resource estimate in such announcement continue to apply and have not materially changed.

Table 5: Thunderbird Project Mineral Resource as reported 5 July 2016.

Mineral Resource Category	Cut-off (Total HM%)	Material (Million Tonnes)	In-situ HM (Million Tonnes)	Total HM Grade (%)	HM Assemblage				Slimes (%)	Oversize (%)
					Zircon (%)	HiTi Leuc (%)	Leuc (%)	Ilmenite (%)		
Measured	3.0	510	45	8.9	8.0	2.3	2.2	27	18	12
Indicated	3.0	2,120	140	6.6	8.4	2.7	3.1	28	16	9
Inferred	3.0	600	38	6.3	8.4	2.6	3.2	28	15	8
Total	**3.0**	**3,230**	**223**	**6.9**	**8.3**	**2.6**	**2.9**	**28**	**16**	**9**
Measured	7.5	220	32	14.5	7.4	2.1	1.9	27	16	15
Indicated	7.5	640	76	11.8	7.6	2.4	2.1	28	14	11
Inferred	7.5	180	20	10.8	8.0	2.5	2.4	28	13	9
Total	**7.5**	**1,050**	**127**	**12.2**	**7.6**	**2.3**	**2.1**	**27**	**15**	**11**

1. The Thunderbird Mineral Resources are reported inclusive of (not additional to) Ore Reserves. The Mineral Resource reported above 3% HMcut-off is inclusive of (not additional to) the Mineral Resource reported above 7.5% HM cut-off. All tonnages and grades have been rounded to reflect the relative accuracy and confidence level of the estimate and to maintain consistency throughout the table, therefore the sum of columns may not equal. The Mineral Resource estimate was prepared and first disclosed under the JORC Code (2012). Refer to Sheffield's ASX announcement dated 5 July 2016 titled *"Sheffield Doubles Thunderbird Measured Mineral Resource"* for further detail.
2. Total heavy minerals (HM) is within the 38µm to 1mm size fraction and has been reported as a percentage of the total material quantity
3. The Valuable HM in-situ grade is reported as a percentage of the total material quantity and is determined by multiplying the percentage oftotal HM by the percentage of each valuable heavy mineral within the HM assemblage at the resource block model scale
4. The Mineral Assemblage is represented as the percentage of HM grade. Estimates of mineral assemblage are determined by screening and magnetic separation. Magnetic fractions were analysed by QEMSCAN for mineral determination as follows: >90% liberation; ilmenite 40-70%TiO_2; leucoxene 70-94% TiO_2; high titanium leucoxene (HiTi Leucoxene) >94% TiO_2 and zircon 66.7% ZrO_2+HfO_2. The non-magnetic fractionwas analysed by XRF and minerals determined as follows: Zircon ZrO_2+HfO_2/0.667 and HiTi Leucoxene TiO_2/0.94

The Ore Reserve of 754 million tonnes at 11.0% HM contains 83 million tonnes of HM compared to the previous Ore Reserve of 748 million tonnes at 11.2% HM containing 83.5 million tonnes of HM as shown in Table 6. The increase in Proved ore tonnes is due to the inclusion of increased amounts of lower grade "T1" material at times due to capacity constraints at the final stage of the WCP and to prevent the excessive buildup of intermediate process stockpiles whilst still maintaining full WCP utilisation. The reduction in Probable ore tonnes is due to the adoption of more conservative final pit slope angles, whilst maintaining the same final crest position as the previous Ore Reserve pit design. The net impact of these refinements results in negligible change in contained HM tonnes over the life of mine between estimates.

Table 6: Previous Thunderbird Ore Reserve, 31 July 2019

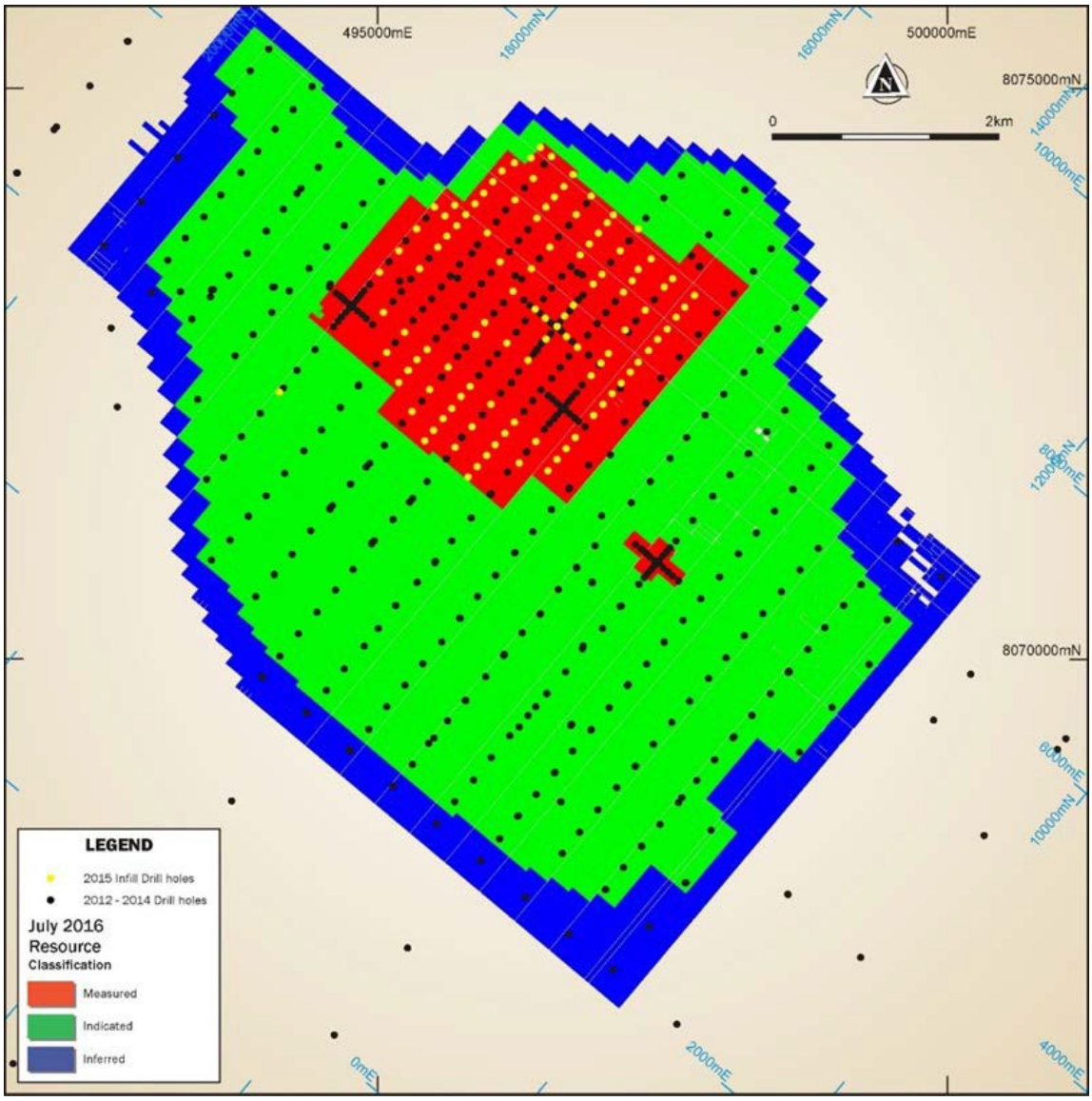
Reserve Category	Material (Mt)	HM (%)	Zircon (%)	HiTi Leuc (%)	Leucoxene (%)	Ilmenite (%)	Oversize (%)	Slimes (%)
Proved	219	13.7	1.0	0.30	0.28	3.7	14	16
Probable	529	10.1	0.79	0.26	0.27	2.9	11	15
Total	748	11.2	0.86	0.27	0.27	3.1	12	15

Notes:

1. Ore Reserves are presented with in-situ HM grade, and mineral assemblage. Tonnes and grades have been rounded to reflect the relative accuracy and confidence level of the estimate, thus the sum of columns may not equal. This Ore Reserve reported for the Dampier Project was prepared and first disclosed under the JORC Code (2012) in the announcement 31 July 2019 Titled "Thunderbird Ore Reserve Update". The Ore Reserve is reported to a design overburden surface with appropriate consideration for modifying factors, costs, mineral assemblage, process recoveries and product pricing
2. The in-situ grade is determined by multiplying the HM Grade by the percentage of each valuable heavy mineral within the heavy mineral assemblage

Figure 2 below shows the distribution of the Measured, Indicated and Inferred Mineral Resource categories in the July 2016 Thunderbird Mineral Resource.

Figure 2: Plan of Thunderbird Mineral Resource by Confidence Category



Mining method selected and other mining assumptions

Conventional open pit bulk dry mining techniques have been chosen for ore mining, incorporating dozer traps and in-pit feed preparation units ("Mining Unit Plant" or "MUP"). Initially one MUP is scheduled, with an additional MUP scheduled from year five of operations. The selected mining method is considered appropriate and has been trialed through the full thickness of the orebody by two trial mining programs in late-2020 and mid-2021 and is suited to the large, relatively thick and sheet-like characteristics of the orebody. Minimal pre-strip is required to access the orebody with topsoil and overburden being excavated, hauled and stockpiled using conventional earthmoving equipment. Following mining and feed preparation, the ore will be slurried and pumped to a nearby wet concentration plant (WCP). Retaining cells are constructed in the developed mine void for the return of process tails. Topsoil is returned in a continuous rehabilitation process. As the mining void is established, increasing amounts of overburden are mined and directly returned to the mining void as backfill.

The two trial mining programs also identified a consistent zone of indurated material within 10 – 12

metres of the natural surface. The indurated or consolidated ore material was identified as a risk to mining and processing performance. During the Enterprise Optimisation studies undertaken by Whittle Consulting Pty Ltd, the oversize field within the Mineral Resource was used as a proxy for induration and a mining pathway was developed that minimized the quantity of oversize in the mining schedule during the period of single MUP operation. This resulted in the starter pit location being moved approximately 1,250 metres down dip and an increase in waste pre-stripping to expose ore material below the indurated zone. The Figures 3 and 4 below show a comparison between the 2019 BFS Update starter pit and mining pathway (purple zone in Figure 3) and the KMS BFS starter pit and mining pathways (green zone in Figure 4). The KMS BFS starter pit creates a significantly lower risk and more flexible starting pit location and mining pathway.

Figure 3. 2019 BFS Update Mining Sequence

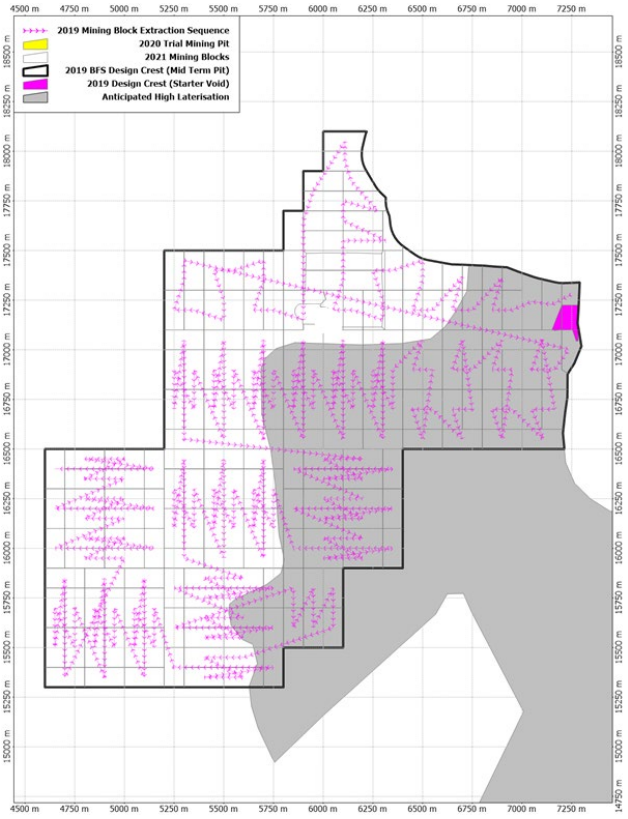
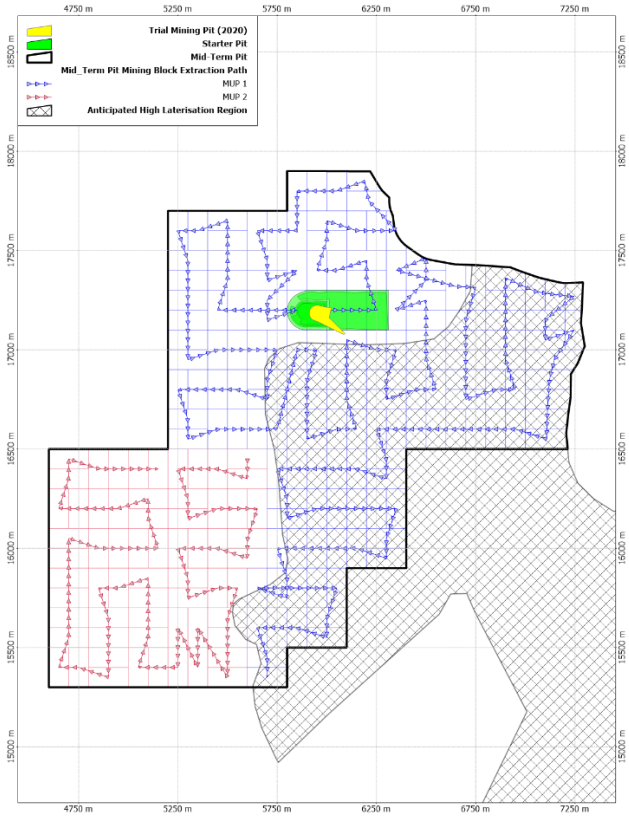


Figure 4. KMS BFS Mining Sequence



The ore mining and feed preparation will be delivered under a contract mining arrangement, where the mining contractor will be responsible for delivering the required target feed rates to the rougher spiral at the WCP at 1,085 dry tonnes per hour for each MUP. The dozer trap mining unit plant (MUP) will operate at an average feed rate of 1,470 dry tph. Screened oversize material will be moved by loader into the pit void. The land clearing, waste mining, tailings storage, road maintenance, pit dewatering, re-contouring and rehabilitation of the completed pit areas and other ancillary activities will be delivered by KMS under either an owner mining scenario with hired or leased equipment or via contract mining arrangements with local civils or mining contractors.

Detailed mine designs have been completed for the mining sequence, waste mining and stockpiling, surface tailings storage facility and in-pit tailing storage methodology for the first 4 years of operations, after which appropriate in-pit tails deposition assumptions have been applied.

Geotechnical investigations carried out at Thunderbird include two trial mining programs, sonic and large-diameter Bauer drilling, costeaning, geotechnical logging, standard penetration tests, in-situ permeability testing, on site point load testing, laboratory test work on soil (unconsolidated ore) and core samples. Engineering appraisal included observations on mineability and dozer productivity assessment from trial

mining programs, test costeaning and large diameter auger drilling and mining vehicle trafficability. Covering the deposit area is a 0.5 metres to 20 metres thick unit of red, sandy-silty soils referred to locally as the Pindan sand and the other material expected to be encountered in the deposit were confirmed to be readily excavatable by tracked dozer and or hydraulic tracked excavator during the trial mining programs.

During the first trial mining program, detailed geotechnical mapping and logging was completed through the full thickness of the orebody. Q Slope recommended safe batter slope angles up to 58.4 degrees have been estimated for the sandstone units not containing potential wedge forming defects, although safe slope angles of up to 50 degrees are recommended where wedge forming defects are present. Safe batter slope angles of 35 degrees should be assumed for the Pindan Soils, Melligo Sandstone and Unit 5 Sandstone. The KMS BFS uses the recommended assumption of overall safe slope angle of 34°for all final walls.

Kimberley Mineral Sands will be responsible for statutory duties, technical services, geology and mine planning, potable water supply, power and communication systems.

Processing method selected and other processing assumptions, including the recovery factors applied and the allowances made for deleterious elements

Conventional modern process beneficiation and mineral separation equipment has been selected in the processing plant and associated infrastructure to produce a Non-Magnetic Concentrate and a Magnetic Concentrate with approximately 38.5% TiO_2 suitable as a feedstock for upgrading and producing high grade chloride slag.

The process infrastructure is fit for purpose and includes the Mining Unit Plant (MUP), Wet Concentration Plant (WCP), Concentrate Upgrade Plant (CUP), Non-Magnetic Finisher Circuit (NMFC) and site buildings, bore field, LNG gas supply and storage, power station and power distribution infrastructure, new and upgraded roads, accommodation village and upgraded materials handling facilities at the Port of Derby. KMS has selected the Port of Derby as its base case logistics solution and intends to examine the use of the Port of Broome as an opportunity to reduce operating risk. No significant difference in capital or operating expenditures are expected as both solutions are assumed to be provided on a Build-Own-Operate (BOO) basis.

An 87.5% utilisation factor has been applied to the MUP and WCP operations and a 94% utilisation factor has been applied to the processing operations in determining annual operating hours and throughput capacity respectively. The MUP and WCP operations and the processing operations can operate independently of each other due to the installation of heavy mineral concentrate (HMC) stockpiles between the WCP and CUP plant areas. The HMC stockpiles significantly increase operational flexibility.

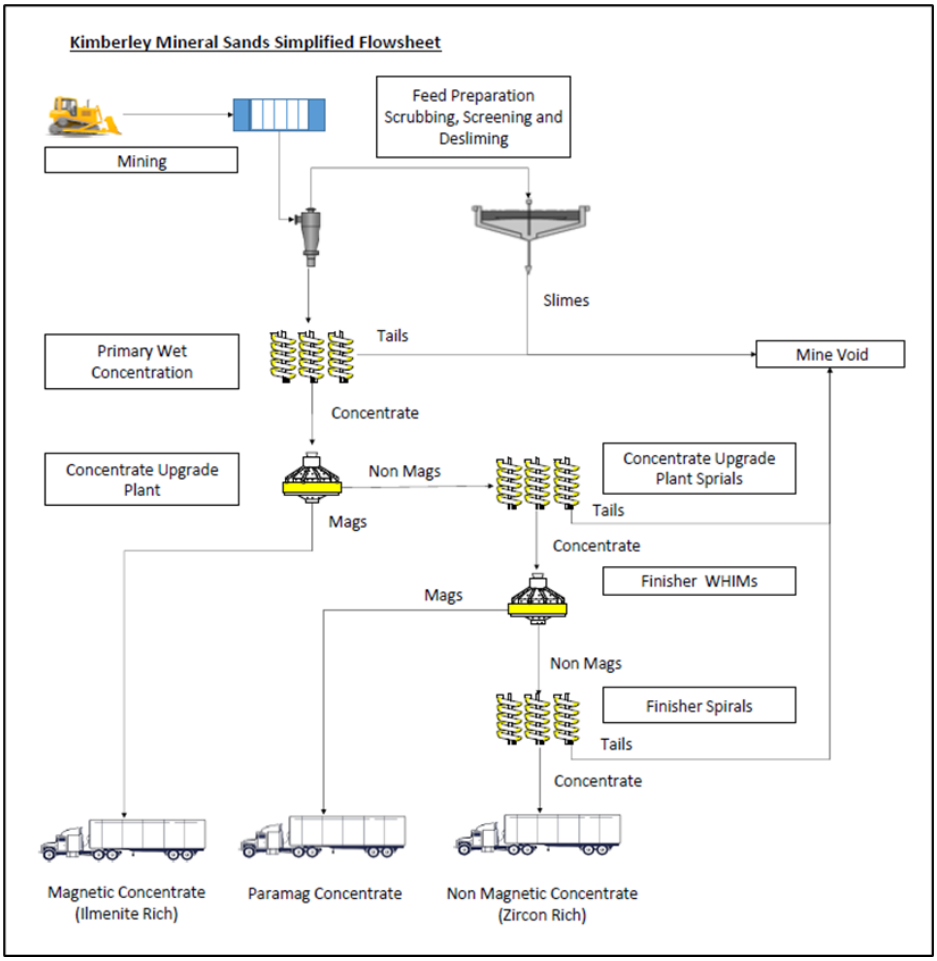
The KMS BFS process and plant capital costs have been informed by GR Engineering Services Limited (GRES) to engineer, procure and construct (EPC) the Stage 1 processing plant. The processing infrastructure is based on a process design and PFDs, mechanical equipment lists and plant and an overall mine site layout, which has been reviewed and agreed with KMS, GRES and third party independent technical experts. The proposed EPC agreement with GRES also includes recovery and performance test guarantees. Capital costs for the Stage 2 expansions were estimated by KMS on a factored basis to replicate the current plant area and utilise common elements within the Stage 1 plant area where appropriate to do so.

Non-processing plant infrastructure and owner's costs were estimated by KMS using negotiated agreements, industry sources or in-house estimation and expertise to determine the non–process plant infrastructure direct costs.

Mineral processing is based on well understood conventional unit processes and has been developed on a 25 tonne bulk sample taken by full scale dozer rip and push method and using full scale or scalable equipment and extensive test work. The process flowsheet is effective in achieving the recoveries from

the Ore Reserve for a suite of products produced over the life of mine, comprising NMC, PMC and MC. The LOM modelled recoveries are 79.3% for Zircon to NMC and 84.6% for ilmenite to MC and these include the assumption of a 3% loss of HM in the Feed Preparation Plant, as reviewed by independent technical experts.

Figure 5: Schematic of the Thunderbird Mining and Mineral Processing Circuit



TZMI have reviewed the proposed product specifications of the Thunderbird products and have verified that they are expected to meet various market uses and typical specifications required for those markets:

- Non-Magnetic Concentrate (NMC) product containing zircon and rutile (37% ZrO_2, 25% TiO_2) suited to a range of applications including the zirconium chemicals industry and as a blended feedstock for production of chloride pigment. The NMC contains c.40% of recoverable premium grade; and
- Paramagnetic Concentrate (PMC) co-product containing zircon and titanium units (8% ZrO_2, 26% TiO_2) in combination with iron oxides and small quantities of monazite.
- Magnetic Concentrate (MC), a low-grade ilmenite product (c. 38.5% TiO_2) containing a mixture of altered ilmenite and iron oxides. Market dynamics for TiO_2 feedstocks have developed in recent times with an increase in demand for chloride slag production making the Thunderbird magnetic concentrate a suitable feedstock for upgrading and producing high grade chloride slag.

Basis of the Cut-off grade or quality parameters applied

The Mineral Resource estimate used a nominal cut-off grade of 1% HM to define a low grade domain and 7.5% HM to define a high grade domain. The Ore Reserve is based on reporting to a designed overburden

surface. The design of this surface considers marginal cut-off grade, based on block revenue exceeding the cost of processing and the application of elevated cut-off grade or an ore discard strategy, to enhance NPV which varies over time. The application of the ore discard strategy has been guided by Enterprise Optimisation studies undertaken by Whittle Consulting Pty Ltd as part of the KMS BFS. The result is a focus on processing dominantly higher grade "T2" domain material early in the life of mine whilst minimizing the levels of oversize material during the Stage 1 of the Project when a single MUP is in operations. As pit depth and overburden material increases, the opportunity cost of processing lower value ore reduces, and the discard strategy is relaxed with increasing amounts of lower grade "T1" material being processed.

Mineral Resource Estimation Methodology

The Mineral Resource estimate is based on aircore (AC) and reverse circulation (RC) drilling data collected by Sheffield from 2012 to 2015. The drill hole database used to define the Mineral Resource comprises 670 vertical AC and RC drill holes for a total of 37,076 metres, with 24,688 samples assayed totaling 36,918 metres. Of that, 15,163 assayed samples totaling 22,660 metres are within the mineralised zones of the resource. Approximately 97% of the samples were taken over an interval of 1.5 metres, thus the drill samples were composited to 1.5 metres downhole intervals for resource estimation.

The nominal drill spacing is approximately 250 metres by 500 metres with the margins of the deposit drilled at a spacing of 500 metres by 500 metres and 1,000 metres by 500 metres. Infill drilling in the area where the high grade domain outcrops at surface, conducted as part of the 2014 and 2015 drilling campaigns, has reduced the nominal spacing to 125 metres by 250 metres. Four separate close-spaced 'crosses' have been drilled at a nominal spacing of 60 metres both along and across strike which can be seen on Figure 2.

Optiro Pty Ltd reviewed the quality of the drill data (location, recovery, sampling and assay quality) and concluded that it is of acceptable quality for use in Mineral Resource estimation and subsequent mine planning.

Wireframe solid model interpretations of mineralisation were made by the Company based on geological logging and heavy mineral (HM) content, using a nominal cut-off grade of 1% HM to define a low grade domain and 7.5% HM to define a high grade domain. Optiro Pty Ltd verified the geological interpretation against the drillhole data and statistical and geostatistical analyses.

Micromine Software ordinary kriging was used to estimate HM %, slimes % and oversize %. Variogram analysis was undertaken to determine the kriging estimation parameters and a kriging neighbourhood analysis was performed in order to determine the block size, sample numbers and discretisation. Grade capping was applied to HM, slimes and oversize. The top cut levels were determined using a combination of top cut analysis tools including grade histograms, log probability plots and the coefficient of variation.

The mineral assemblage of the Thunderbird Mineral Resource was estimated from mineralogical analyses of 759 composites created from 374 drill holes, totaling 14,308 metres, from the 2013, 2014 and 2015 drilling programs. Analysis was by a combination of screening, magnetic separation followed by QEMSCAN analysis of the magnetic component and XRF determination of the non-magnetic component. Details of mineralogical calculations are provided in the footnotes to the Mineral Resource tabulations. The composites consisted of samples taken from discrete intervals from within five geological units across multiple holes and combined. The composites used to estimate the valuable heavy mineral (VHM) content of the HM are well distributed throughout the deposit. An inverse distance approach was used to estimate zircon %, high titanium (HiTi) leucoxene %, leucoxene % and ilmenite %.

The HM, slimes, oversize and VHM estimates were validated by Optiro Pty Ltd as follows:

- visual checking of the interpolation results compared with drilling in both plan and section.
- comparison of the global input (composites) and output (model) statistics, including clustered and declustered composites.

- examination of trend plots of the input data and estimated block grades.

The Mineral Resource estimate is considered robust on the basis of the above review.

Bulk density measurements of mineralisation were conducted during the large diameter Bauer drilling program (refer ASX announcement dated 17 September 2015) through approximately 100t combined of topsoil, mineralised and non-mineralised materials. The results of this work confirmed the bulk density values predicted from an industry-standard formula (used in previous resource estimates at Thunderbird) which accounts for the HM and slimes content of heavy mineral sand deposits. This formula has been applied to predict bulk density for the 2016 Mineral Resource estimate.

A bulk density measurement program was completed during the trial mining program in mid-2021 where eight test pits were excavated using a 35t excavator with a smooth toothed bucket, within the confines of the second trial pit ramp. The volume of the pits and material excavated was measured using a laser scanner and the mass of the material excavated was measured by the LoadRite and recorded to provide an estimate of the bulk density (wet) estimate for mainly Broome Sandstone in the T2 upper zone. The weights of the material excavated from each site were correlated with the measured volumes of both the excavated voids and the resultant stockpiles. These were used to calculate a bulk density for both insitu material and loose density of swell factor. The bulk density for the T2 upper was within 3% of the average bulk density from the from the resource model for the area.

The Mineral Resource estimate has been classified (according to the definitions of the JORC Code, 2012) into Measured, Indicated and Inferred Resources, taking into account data quality, data density, geological continuity, grade continuity and confidence in estimation of heavy mineral content and mineral assemblage. In plan, polygons were used to define zones of different classification. Measured Resources encompass an area inclusive of the 125 metres by 250 metres infill drilling and the four separate 'crosses' of close-spaced drilling, where drill spacing is 60 metres along strike and 60 metres across strike. Indicated Resources are defined where drilling is 500 metres along strike by 250 metres across strike and Inferred Resources are defined around the margins of Indicated Resource, where the drill spacing is 500 metres by 500 metres.

The Thunderbird Mineral Resource estimate has been reported at both 3% HM and 7.5% HM cut-off grades. These cut-off grades were selected by KMS based on technical and economic assessments and by comparison with similar deposits currently being or recently mined. Based on the same technical and economic assessment, and taking into consideration the thickness, grades and depth of the deposit, it is considered that the entire deposit has a reasonable prospect of eventually being mined, and that the current extents of the deposit are limited only by drilling.

Ore Reserve Estimation Methodology, including recovery factors and mining dilution.

The study supporting the Ore Reserve has been completed to Bankable Feasibility Study (BFS) level, with the following modifying factors accurate to the study level applied.

Enterprise optimisation studies by Whittle Consulting (which models the entire process chain and applies cost, recovery, and revenue multipliers at appropriate stages) were completed on the Mineral Resource to guide ore and waste discrimination and mining pathway.

Detailed mine design and schedules supported by pit optimisation and strategic scheduling studies were applied regarding cut over strategies.

A 98% mining recovery factor was applied to ore material, no additional dilution factor was applied given the bulk nature of the proposed mining operations and the removal of overburden and mineralised waste well in advance of ore mining.

Minimum mining width considerations are not applicable given the dimensions of the mining blocks guiding pit design.

The following mining method was assumed to determine mining costs.

- to access the orebody with topsoil and overburden being excavated, hauled and stockpiled or

returned to mining voids using conventional earthmoving equipment.

- bulk mining techniques have been chosen for ore mining, incorporating dozer traps and in-pit feed preparation units ("Mining Unit Plant" or "MUP").
- following ore mining and feed preparation, the ore will be slurried and pumped to a nearby wet concentration plant (WCP).
- waste and tailings cells walls are constructed in the mine pit void to store waste materials.
- waste and tailing materials are recontoured to approximate the original landforms and topsoil replaced and seeded to rehabilitate the areas.

The mine was scheduled on 200 metres by 100 metres ore blocks over the first 8 years after which larger scheduling blocks have been used.

The mine schedule focusses mining higher grade ore during the initial stage of operation using a single MUP and thereafter lower grade T1 material is only introduced as ore feed when required to optimize process throughputs or later in the life of mine as the benefit to early cashflow from an ore discard strategy is reduced.

Detailed mine designs have been completed for the mining sequence, waste mining and stockpiling, surface tailings storage facility and in-pit tailing storage methodology for the first 4 years of operations, after which appropriate in-pit tails deposition assumptions have been applied.

Geotechnical analyses form the basis of pit design criteria including excavatability, trafficability and pit slope wall angles with a life-of-mine average strip ratio (waste: ore) being 0.81 : 1.00.

Overall safe wall angles of 34 degrees were used.

Project operating costs were estimated using equipment lists, pump and motor calculations (to assess power demand), manning schedules (to assess operating labour), mobile equipment and duty schedules (to assess fuel demand) and supporting calculations for all other consumables

General and administration operating costs were built up on a first principles basis from manning schedules, labour work rosters, operation of on-site village accommodation, light vehicle and mobile equipment costs and other administration related fixed costs such as communications, IT, consultants, recruitment, and annual tenement costs.

Product will be transport from the process plant to the Ports of Derby approximately 150km by road. The Port of Derby has existing bulk handling facilities for bulk products to the transhipped to ocean going vessels. KMS intends to examine the use of the Port of Broome as an opportunity to lower operating risk. No significant difference in capital or operating expenditures is expected as both solutions are assumed to be provided on a BOO basis.

Transport and logistics cost assumptions were obtained from various independent sources, including contractors quotations, expression of interest processes issued and evaluated by KMS and third party consultants on an Free On Board (FOB) basis.

Refer to Appendix A for JORC Sections 4 for further details.

Material modifying factors, including the status of environmental approvals, tenements and approvals, other governmental factors and infrastructure requirements for selected mining methods and for transportation to market.

The activities required for the Ore Reserve comply with all existing Project approvals. All environmental approvals from State and Federal Government have been received. This includes:

- Ministerial Statement 1080,
- Department of Water and Environmental Works Approval

- License to take Water GWL201977(1)
- Australian Government Department of Environment and Energy EPBC approval 2018-7648

Amendments to secondary approvals being the Works Approval, Mining Proposal and the Groundwater License will be required over time as these approvals relate to details of Project design and implementation associated with the staged development of the Project and increases in mining and processing capacity. The current approvals strategy ensures the Project is fully approved at all Stages, but also maintaining flexibility in scope, timing and licensing and approval costs.

The Project has a granted Mining Lease and Native Title and Heritage agreements. The Company signed a Co-existence Agreement (Native Title Agreement) for Thunderbird on 31 October 2018. The Co-existence Agreement establishes the framework by which KMS can work with the Traditional Owners to protect Aboriginal heritage and the environment while delivering sustainable employment and business outcomes for Traditional Owners and the wider Aboriginal community.

In 2018, an ethnographic site was registered over the Mining Lease by a third-party non-member of the Mt Jowlaenga Polygon #2 Named Applicants, which is now part of the Joombarn Buru Native Title Determination. This was addressed via a Section 18 process under the Aboriginal Heritage Act, 1972, in consultation and with the consent of Mt Jowlaenga Polygon #2 Named Applicants and the Kimberley Land Council (KLC).

Thunderbird is conveniently located near two existing ports: Port of Broome is 148km away including 115km of major national highway, and the Port of Derby is 146km away including 113km of major national highway. It is proposed the product will be trucked from mine to port.

Port of Derby has been selected for exporting bulk products as it has existing bulk loading facilities conveyor and shiploader and an access agreement in place for port storage, wharf and bulk handling facility with the Shire of Derby West Kimberley. Bulk products will be stored in a purpose-built 100kt facility (Stage 1) at the port and loaded by conveyor onto barges, increased to 150kt (Stage 2) with transhipped 20-30kms to meet a moored ocean-going vessel where products will be transferred. The barging & transshipment of bulk products has been successfully operated by previous users at 500ktpa.

KMS intends to examine the use of Port of Broome as an opportunity to lower operating risk. The Port of Broome is well equipped with existing infrastructure and stevedoring services to load products directly to ship hold. No significant difference in capital or operating expenditures is expected as both solutions are assumed to be provided on a BOO basis. KMS estimate of overall cost to vessel hold are similar for either option, however consideration of operating factors and/or commercial arrangements may lead to a change to the Port of Broome. Subject to activities being substantially complete to enable this transition, export through the Port of Derby using a BOO arrangement is assumed. Appropriate allowance has been made for the relevant operating cost charges.

The Thunderbird Project comprises 483 square km of mining tenure in the West Kimberley Mineral Field of Western Australia. All the mining tenements within the Project are 100% held by Thunderbird Operations Pty Ltd, a 100% subsidiary of Kimberley Mineral Sands.

Mining and processing operations will be conducted on mining lease M04/459 whilst the accommodation village will be located on miscellaneous license L04/85. The Project's access roads and future power and pipeline corridors will be on granted miscellaneous licenses L04/82, L04/83, L04/84 and L04/86.

The Project straddles the boundary of two pastoral leases, mining lease M04/459, miscellaneous licenses L04/84 – L04/86, the northern portion of miscellaneous license L04/82 and miscellaneous licenses L04/92 and L04/93 are within the Mt Jowlaenga Pastoral Lease (N050161), and the southern portion of miscellaneous license L04/82 and miscellaneous license L04/83 are within the Yeeda Pastoral Lease (N050691). Both pastoral leases are owned and operated by Yeeda Pastoral Company Pty Limited. KMS is currently negotiating an agreement with the pastoral lessee in respect of the rights and obligations to mine and operate on the pastoral lease.

The southern portions of miscellaneous licenses L04/82 and L04/83 where they intersect with the Great

Northern Highway fall within the overlying Crown Reserve 9697 (Kimberley De-Grey Stock Route) managed by the Department of Regional Development and Lands. KMS has engaged the relevant authority and there are no outstanding matters regarding the required construction and use of the entry.

This Ore Reserve is based on information compiled by Mr. Per Scrimshaw, an employee of Entech Pty Ltd. Other experts, including Optiro Pty Ltd, IHC Robbins, GR Engineering Services, MBS Environmental, ATC Williams, Infinity Corporate Finance and employees of KMS have been relied upon for information regarding Mineral Resources, engineering, geotechnical, metallurgy and process design, environmental, operating and capital costs and financial modelling.

Further details regarding the Ore Reserve estimate are included as Appendix A.

This ASX announcement has been authorised for release by the Company's Board of Directors.

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COMPLIANCE STATEMENTS

The information in this announcement that relates to Ore Reserve is based on, and fairly represents, information and supporting documentation prepared by Mr Per Scrimshaw, a Competent Person who is a Member of The Australasian Institute of Mining and Metallurgy. Mr Scrimshaw is employed by Entech Pty Ltd and has sufficient experience that is relevant to the style of mineralization and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Scrimshaw consents to the inclusion in the announcement of the matters based on his information in the form and context in which it appears.

PREVIOUSLY REPORTED INFORMATION

The Mineral Resources and Ore Reserves contained in this announcement have been extracted from the following ASX releases:

"MINERAL RESOURCE AND ORE RESERVE STATEMENT" 24 September 2019
"THUNDERBIRD ORE RESERVE UPDATE" 31 July 2019
"THUNDERBIRD ORE RESERVE UPDATE" 16 March 2017
"SHEFFIELD DOUBLES MEASURED MINERAL RESOURCE AT THUNDERBIRD" 5 July 2016

A copy of these announcements is available at http://www.sheffieldresources.com.au/

Bankable Feasibility Study ("BFS")

This document contains information that relates to a Bankable Feasibility Study. This information was extracted from the following ASX releases by Sheffield:
"THUNDERBIRD BFS, FINANCING AND PROJECT UPDATE" 24 March 2022
"BFS UPDATE MATERIALLY IMPROVES PROJECT ECONOMICS" 31 July 2019
''THUNDERBIRD BFS DELIVERS OUTSTANDING RESULTS" 24 March, 2017

Other Extracted Information

In addition to those ASX releases referred to above, this Information Memorandum contains information extracted from the following ASX releases:
"JOINT VENTURE COMPLETION AND BOARD RESTRUCTURE" 12 March 2021
"SHEFFIELD AND YANSTEEL EXECUTE BINDING JV AGREEMENTS" 6 January 2021
"TRANSFORMATIONAL THUNDERBIRD JOINT VENTURE" 11 August 2020
"NATIVE TITLE AGREEMENT SIGNED BY TRADITIONAL OWNERS" 1 November 2018
"MINING LEASE GRANTED OVER THUNDERBIRD MINERAL SANDS PROJECT" 26 September 2018
"FEDERAL ENVIRONMENTAL APPROVAL GRANTED FOR THUNDERBIRD" 28 September 2018
"DOZER TRAP MINING METHOD PREFERRED FOR THUNDERBIRD" 17 September 2015

The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcements and, in the case of estimates of Mineral Resources, Ore Reserves, Pre-feasibility Study and Technical Study results, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.

FORWARD LOOKING AND CAUTIONARY STATEMENTS

Some statements in this report regarding estimates or future events are forward-looking statements. They involve risk and uncertainties that could cause actual results to differ from estimated results. Forward-looking statements include, but are not limited to, statements concerning the Company's exploration program, outlook, target sizes and mineralised material estimates. They include statements preceded by words such as "anticipated", "expected", "targeting", "likely", "scheduled", "intends", "potential", "prospective" and similar expressions.

Appendix A – JORC 2012 Checklist of Assessment and Reporting Criteria

Thunderbird Ore Reserve 24 March 2022

Section 1 Sampling Techniques and Data

Criteria	JORC Code explanation	Commentary
Sampling techniques	• *Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.* • *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* • *Aspects of the determination of mineralisation that are Material to the Public Report.* • *In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1m 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.*	• NQ (70mm) and HQ (90mm) diameter aircore drilling used to collect 2-3kg samples at 1.5m intervals down-hole. • Mineral sands industry-standard drilling technique. • See below for sample and assay QAQC procedures and analysis.
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).*	• Aircore system; NQ size for 39% of drill database (14,285m); HQ diameter for 61% (22,791m). • Blade drill bit used for majority (80%) of drilling. • Where hard rock layers were intersected and unable to drill with blade bit, a pencil (open-hole) or reverse circulation hammer was used. • System used as an industry standard for HMS deposits.
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.*	• An orientation process was undertaken at the beginning of the program to optimise the sampling system to collect a 2-3kg sub-sample from 1.5m intervals. The remainder of the drill sample (spoil) has been retained as 3m-composites for future analysis if required.

Criteria	JORC Code explanation	Commentary
	• *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.*	• Sample weight is recorded at the laboratory • Duplicate samples are collected at the drill site (see below) to enable analysis of data precision. • Sample condition (wet to dry and good to poor qualitative recovery) is logged at the drill site. Of the total sample database, 32% were collected as wet samples and 4% were classed as having poor recovery. • Historically a small negative bias in HM% and OS% and a small positive bias in SL% for dry compared with wet samples has been identified, as well as a small negative bias in HM% and OS% and a positive bias in SL% for samples with good recovery compared to those with poor recovery. • Recovery has a greater influence than wetness on HM%, OS% and SL% values. • The very small number of wet-poor recovery samples in the database (2%), and the conservative bias in HM grade suggests no significant effect on the resource estimate due to sample condition. • The sample quality is considered appropriate for the Mineral Resource estimation procedure and classification applied.
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.*	• Every drill sample is washed and panned, then geologically logged on-site in 1.5m intervals, recording primary, secondary and oversize lithology, qualitative hardness, grainsize, rounding, sorting, and washability, visual estimates of HM%, SL% and OS%, and depth to water table. • The entire length of the drill hole is logged; minimum (nominal) interval length is 1.5m. • Logging is suitable such that interpretations of grade and deposit geology can be used to support the Mineral Resource estimation procedure and classification applied. • At Thunderbird drilling of 20 sonic core holes as part of geotechnical investigations, and 5 large diameter Bauer holes for bulk sample collection. Assay results from these programs have not been incorporated into this resource estimate because the sample collection method is not of sufficient quality. However, visual observations have been incorporated into the geological interpretation of the deposit.
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.* • *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.* • *For all sample types, the nature, quality and appropriateness of the sample preparation technique.*	<u>HM%, SL% OS% Determination</u> Drill Site • A 2-3kg sample is collected at 1.5m intervals in numbered bags at the drill site via rotary splitter at the cyclone discharge point. • Duplicate samples (field duplicates) collected at drill site 1 in every 40 samples.

Criteria	JORC Code explanation	Commentary
	• *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.*	• Reference standard and blank material samples inserted 1 each in every 40 samples. • Samples submitted to an external laboratory for heavy liquid separation (HLS) determination of weight per cent heavy mineral (HM%), Slimes (SL%) and Oversize (OS%). Laboratory • The 2-3kg drill sample is sub-sampled via a rotary splitter to approx. 200g for analysis. • The 200g sub-sample is soaked overnight in water. • 2012 samples (21% of sample database): screened and weighed. • 2013 – 2015 samples (79% of sample database): a 5 minute attrition in a plastic bucket with low solids density, then screened and weighed. • HM%, SL% and OS% calculated as percentage of total sample weight (see below). Laboratory repeats are conducted 1 in every 20 samples (for 97% of the assay database) or 1 in every 15 samples (for 3% of the assay database). • Laboratory internal standard inserted 1 in every 40 samples (for 97% of the assay database). • Laboratory provides a sachet containing the Heavy Mineral Concentrate (HMC) for each sample – this is used in HM assemblage determination (see below). All • Spacing of duplicate, standard, blank and lab repeat samples are designed to identify sample misplacement or misallocation during sample collection and laboratory analysis. • Visual estimates of HM%, SL% and OS% logged at the drill site are compared against laboratory results to identify significant errors. • Analysis of field duplicate samples and laboratory repeats show the data has acceptable precision, indicating the sub-sampling and sample preparation techniques are appropriate for the deposit style and the Mineral Resource estimation procedure and classification applied. <u>HM Assemblage Determination</u> • Heavy Mineral Concentrate (HMC) from individual samples is combined according to HM grade and weight into (nominal) 50g – 100g composite samples for HM assemblage determination.

Criteria	JORC Code explanation	Commentary
		• Weighed HMC is split via a micro-riffle to ensure HM%, SL% and OS% of the final composite sample can be correctly calculated. • HM assemblage determination was by a combination of screening, magnetic separation, QEMSCAN™ and XRF assay to determine the component mineralogy. • This is considered an industry standard method, typically optimised according to the HM characteristics of individual deposits. • For Thunderbird the method was designed and optimised using an iterative trial process and the results of 6t and 5t bulk sample process metallurgical test work. • 4% of samples in the HM assemblage database were repeated from the original drill sample and 4% of samples were repeated from the composite HMC. • Analysis of these repeats show the data has acceptable precision, indicating the sub-sampling and sample preparation techniques are appropriate for the deposit style and the Mineral Resource estimation procedure and classification applied.
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.*	<u>HM%, SL% OS% Determination</u> • Assay and laboratory procedures are industry standard, although method specifics and heavy liquid composition can vary. • SL% was determined using a 45µm (28% of samples) or 38µm (72% of samples) screen. • OS% was determined using a +1mm screen. • HM% was determined using heavy liquid TBE (2.96g/ml). • The method produces a total grade as weight per cent of the primary sample. • Method does not determine the relative amounts of valuable (saleable or marketable) and non-valuable heavy mineral species. See below for details of HM assemblage determination. • Reference standard and blank material samples inserted at the drill site 1 each in every 40 samples. • Laboratory internal standard inserted 1 in every 40 samples (97% of the assay database). • The HM reference samples used are field-homogenised bulk samples with expected values and ranges determined by the Company from assay results. Blank material used is commercially available builder's sand. • Reference standards and blanks are examined for performance over time and within laboratory batches. Batches or sub-batches are re-analysed if unacceptable QAQC data are returned. • In total QAQC samples represent 15% of the total assay database.

Criteria	JORC Code explanation	Commentary
		• Analysis of reference standards, blanks and laboratory repeats show the data to be of acceptable accuracy and precision for the Mineral Resource estimation procedure and classification applied. <u>HM Assemblage Determination</u> • HM assemblage determination was by a combination of screening, magnetic separation, QEMSCAN™ and XRF assay to determine the component mineralogy of the HMC. • This method is considered an industry standard, typically optimised according to the HM characteristics of individual deposits. • For Thunderbird the method was designed and optimised using an iterative trial process and the results of 6t and 5t bulk sample process metallurgical testwork. • HMC was screened at 106µm and each fraction weighed (studies show Thunderbird HM with grainsize >106µm does not contain significant amounts of VHM and is dominated by cemented sand aggregates). The -106µm fraction was then magnetically separated into highly-susceptible (H/S), magnetic 1, magnetic 2 and non-magnetic fractions, with each fraction weighed. The magnetic 1 & 2 fractions were combined and analysed by QEMSCAN™ for mineral determination as follows: - Ilmenite: 40-70% TiO_2 >90% Liberation - Leucoxene: 70-94% TiO_2 >90% Liberation - High Titanium Leucoxene (HiTi Leucoxene): >94% TiO_2 >90% Liberation - Zircon: 66.7% ZrO_2+HfO_2 >90% Liberation The non-magnetic fraction was submitted for XRF analysis and minerals determined as follows: - Zircon: ZrO_2+HfO_2/0.667 - High Titanium Leucoxene (HiTi Leucoxene): TiO_2/0.94 • Reference material was not used, other measures of accuracy and the method design is considered sufficient to establish acceptable accuracy of the data for the Mineral Resource estimation procedure and classification applied. • Analysis of laboratory repeats and comparison with bulk metallurgical testwork results show the data to be of acceptable accuracy and precision for the Mineral Resource estimation procedure and classification applied.

Criteria	JORC Code explanation	Commentary

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.*
		• Data is logged electronically using "validation at point of entry" systems prior to storage in the KMS drill hole database, which is managed by KMS personnel and an external consultancy.
		• Documentation related to data custody and validation is maintained by KMS.
		• A copy ("snapshot") of the Mineral Resource database is retained separately from the primary drill hole database.
		• 101 twinned drill holes have been examined for comparison of assay data between factors such as year drilled, hole diameter, drill type and assay method. A further 24 twinned drill holes have been examined to compare 2015 drilling with previous years' programs.
		  ○ Analysis of the 101 drill hole twins show the 2012 assay data (45µm screen and no attritioning step) is biased low in HM% compared with 2013 assay data (45µm screen or 38µm screen, with attritioning step). A similar high bias is seen in OS%. The bias is explained by the low energy attritioning step liberating HM from loosely-held aggregates, and the change in slimes screen from 45 µm to 38 µm used in 2013 and 2014.
		  ○ Analysis of the 24 drill hole twins show the 2015 program is biased significantly high in SL%, insignificantly low in OS%, and no bias in HM%. This is interpreted to be caused by the extended use of a reverse circulation hammer bit during the 2015 program (primarily to improve drilling efficiency).
		• All data was used in the Resource estimate.
		• The 2012 drill assay HM% and SL% data that was screened at 45µm (21% of assay database) was adjusted to 38µm data. The regression equations applied were from 38µm and 45µm data that has correlation coefficients of over 0.97 for HM% and SL%.
		• The 2015 drill assay SL% and OS% data was adjusted based on results of twinned holes to remove the bias introduced by the differing drill and assay methods (9% of assay database).
		• 43 twinned drill holes have been examined for comparison of HM assemblage data between factors such as determination method, year drilled, and HM assay method.
		• Analysis shows HM assemblage determined by QEMSCAN™ alone on 2012 samples (90 data), and by combination magnetic separation/ QEMSCAN™/XRF on 2012 samples (106 data), has a significant bias low compared with combination magnetic separation/ QEMSCAN™/XRF on 2013 and 2014 samples (702 data). This bias cannot be explained by natural (ie. deposit-related) factors, and is a result of a change in sample preparation from 2012 to 2013 (as discussed above). As a result of this

Criteria	JORC Code explanation	Commentary
		analysis, HM assemblage data used in the Resource estimate includes only samples from holes drilled after 2012 (88% of the database) in order to ensure a consistent determination method across the deposit. • The verification and treatment of the data is considered sufficient for the Mineral Resource estimation procedure and classification applied.
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.*	• Drill hole collar locations were surveyed by licensed surveyors using a RTK GPS system with expected accuracy of +/- 0.02m horizontal and +/- 0.03m vertical. • 22 drill holes of the 670 (3%) in the estimate database were not surveyed, for these holes planned or approximated coordinates have been used. • Coordinates are referenced to the Map Grid of Australia (MGA) zone 51 on the Geographic Datum of Australia (GDA94). • Vertical datum geoid model is AUSGEOID09 (Australia). • Drill hole RL for Resource estimation is determined by projection of surveyed drill hole collars to a regional (Landgate) DTM model. • The Mineral Resource estimate uses this model as surface topography. The average difference between surveyed and modelled RL is 0.5m which is considered negligible given the nature of the mineralisation, and the size of the Thunderbird deposit. • The quality and accuracy of the topographic control is considered sufficient for the Mineral Resource estimation procedure and classification applied.
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.*	• See figures in body of announcement for hole distribution. • The nominal spacing of most drill holes is 250m x 500m, with edges at 500m x 500m and 1,000m x 500m. Infill drilling has reduced the nominal spacing to 125m x 250m in the up-dip area of the resource. Four areas are drilled at nominal 60m hole spacing for bulk sample collection and geostatistical data analysis. • The drill database used in the Resource estimate comprises 670 holes, totaling 37,076m, with 24,688 samples assayed totaling 36,918m (99.6% of metres drilled). Of that, 15,163 assayed samples totaling 22,660m (61%) are within the mineralised zones of the Resource (see below for criteria). • Samples for HM assemblage determination are composited on intervals according to a combination of grade and geology appropriate to reflect resource estimation domains. • 759 composites from 374 holes totaling 14,308m are used in the resource estimate. This represents 63% of the total length of drill holes within mineralised zones of the resource. • The data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource estimation procedure and classification applied.

Criteria	JORC Code explanation	Commentary
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.*	• Mineralisation is flat-lying to less than 4deg. dip, vertical drill holes therefore approximate true thickness and perpendicular intersection of mineralisation. • Note sections in the body of the announcement are displayed with vertical exaggeration.
Sample security	• *The measures taken to ensure sample security.*	• Sample security is not considered a significant risk given the location of the deposit and bulk-nature of mineralisation. • Nevertheless, the use of recognised transport providers, sample dispatch procedures directly from the field to the laboratory, and the large number of samples are considered sufficient to ensure appropriate sample security.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• All data has been validated and reviewed by at least two KMS geologists, and by Resource consultancy Optiro Pty Ltd. • The (previous) July 2015 Mineral Resource and associated data was reviewed in December 2015 by an external Resource consultancy. This review found the sampling techniques and data to be sound and suitable for use in resource estimation. Recommendations were made to address the low bias in HM% values from 2012 drill holes and obtain measurements for bulk density determination.

Section 2 Reporting of Exploration Results

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.* • *The security of the tenure held at the time of reporting along with any known impediments to obtaining a license to operate in the area.*	• The Mineral Resource reported is entirely within Exploration License E04/2083, located on the Dampier Peninsula about 60km west of Derby, and 25km northof the sealed Great Northern Hwy joining Derby and Broome • E04/2083 was granted on 05/09/2011 and is due to expire on 04/09/2023, Thunderbird Operation Pty Ltd will apply for an extension of the term of the tenement prior to its expiry. It is held 100% by Thunderbird Operation Pty Ltd. • On 16/07/2014 Thunderbird Operation Pty Ltd lodged a Mining Lease Application (M04/459) over the Thunderbird deposit. Mining Lease Application (M04/459) was granted on 25/09/2018 and is due toexpire on 24/09/2039. Thunderbird Operations Pty Ltd will apply for an extension of the term of the tenement prior to its expiry • There are no known or experienced impediments to obtaining a license tooperate in the area • Thunderbird Operations Pty Ltd has been operating successfully in the region for more than 10 years to date

Criteria	JORC Code explanation	Commentary
Exploration done byother parties	• *Acknowledgment and appraisal of exploration by other parties.*	• The Dampier project area was explored by Rio Tinto ("Rio") between 2003 and2009. Rio completed four broadly spaced aircore drill traverses, identifying heavy mineral concentrations at Thunderbird averaging 8.07% HM with 8.0% *zircon. Rio surrendered the tenements following the 2008 global financial crisis.* • *Further details* are included in Sheffield's ASX release entitled 'New License Granted Over High Grade Zircon Project' dated 7 September, 2011 (available from the company's website: www.sheffieldresources.com.au).
Geology	• *Deposit type, geological setting and style of mineralisation.*	• The Dampier Project is within the Canning Basin in the Kimberley region of Western Australia. The Canning Basin is an intracratonic basin which containsOrdovician to Cretaceous deposits covered by Cenozoic sediments. • Thunderbird is a heavy mineral sand (HMS) deposit hosted by the deeply weathered Lower Cretaceous-aged Broome Sandstone stratigraphic unit. Valuable heavy minerals (VHM) contained within the deposit include altered ilmenite, ilmenite, zircon, leucoxene and rutile. • Mineralisation is in a thick, broad anticlinal sheet-like body striking northwest. In the core of the anticline it is at surface, rolling at about 4deg. dip about the axis, extending under cover to the southwest. The areal extent, width, grade, geological continuity and grainsize of the Thunderbird mineralisation are interpreted to indicate an off-shore, sub-wave base depositional environment. • Sheffield geologists have defined three stratigraphic units within the deposit area using a combination of surface mapping and drill hole lithological logs. These are referred to locally as the Fraser Beds, Melligo and Thunderbird Formations. Of these the Thunderbird Formation is the most important, representing the main mineralised unit. Also important, the Fraser Beds act asa distinct marker unit toward the base of the Thunderbird Formation, enabling confidence in interpretation of the extent, strike and dip of the stratigraphy. • The Thunderbird Formation is described as medium to dark brown/orange, fineto very fine well sorted compacted sand, highly weathered sandstone and

Criteria	JORC Code explanation	Commentary
		minor discontinuous iron-cemented bands. It is up to 90m thick and is very richin heavy minerals (up to 40% HM). It is modelled over the Resource area as atleast 8.5km along strike and up to 6.5km wide. • The iron cemented sandstone layers are thin (typically 5-10cm thick and rarely >30cm thick) and discontinuous and are not considered to present any increased risk to potential mining of the deposit. • Mineralisation is predominantly within compacted sand, except where it occurswithin ~12m of surface where it is present mostly as a highly weathered (weaklyindurated) sandstone. Process test work and excavation studies show typical recovery levels of high-quality VHM products are achieved from both material types (refer to Sheffield's website for further information on recovery and excavatability studies). • Also within the Formation is a continuous, very-high grade HM (>7.5%) zone named the GT Zone. This Zone is up to 46m thick over an area at least 8km x4.5km, strikes approximately north-south, follows the dip of the Thunderbird Formation and is open along strike. The high-grade of HM in the GT zone is interpreted to result from deposition in off-shore higher wave energy shoals.
Drill hole Information	• *A summary of all information material to the understanding of the exploration results including a tabulation of the following informationfor all Material drill holes:* ○ *easting and northing of the drill hole collar* ○ *elevation or RL (Reduced Level – elevation above sea level inmetres) 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.*	• Exploration results relating to the drillholes used in the resource have been publicly released in numerous previous Company announcements referring tothe Dampier Project and Thunderbird Deposit. • Information relating to the number of drillholes, assayed samples, location accuracy, orientation etc. is included in this table, and in the body of the announcement. • Diagrams in the body of the announcement show the location of and distribution of drillholes in relation to the Mineral Resource.
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.*	• N/A

Criteria	JORC Code explanation	Commentary
	• *Where aggregate intercepts incorporate short lengths of high graderesults and longer lengths of low grade results, the procedure usedfor 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.*	
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').*	• Mineralisation is flat-lying to less than 4deg. dip, vertical drill holes therefore approximate true thickness. • Refer to diagrams in the body of the announcement for visual representation of drill hole orientation vs. deposit orientation, note the vertical exaggeration used.
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 ofdrill hole collar locations and appropriate sectional views.*	• See body of announcement for plan and cross section views and Mineral Resource tabulations.
Balanced reporting	• *Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	• All information considered material to the reader's understanding of the database, estimation procedure and classification of the Mineral Resource hasbeen reported.
Other substantive exploration data	• *Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.*	• Sheffield has previously reported deposit information for Thunderbird including a maiden Mineral Resource estimate (December 2012) and Mineral ResourceUpdates (March 2014, December 2014 and July 2015); Scoping Study results (April, 2014); Pre-feasibility Study results (May 2015 and October 2015); maiden Ore Reserve (January 2016); Bankable Feasibility Study (BFS) 16March 2017), Bankable Feasibility Study Update (BFSU) 31 July 2019 and Ore Reserve Update 31 July 2019. These include information on mineral assemblage, mineralprocessing, VHM product recoverability, quality and marketability and mining and financial evaluation. • Where relevant this information has been included in the body of this announcement.
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 an future drilling areas, provided this information is not commercially sensitive.*	• At this stage no additional resource updates are planned.

Section 3 Estimation and Reporting of Mineral Resources

Criteria	JORC Code explanation	Commentary
Database integrity	• *Measures taken to ensure that data has not been corruptedby, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimationpurposes.* • *Data validation procedures used.*	• Drill hole data was extracted directly from KMS drill hole database whichincludes internal data validation protocols. • Where necessary, original drill hole log files are consulted to rectify any errors identified. • Validation of the exported data was confirmed using mining software (Micromine) validation protocols, and visually in plan and section views. • Compilation of data external to the drill database (eg. HM assemblage sourcedata) is cross-checked manually, and through statistical comparison. • A copy ("snapshot") of the Mineral Resource database is retained separately to the primary drill hole database. • Data was further verified and validated by Optiro upon receipt, and prior to use inthe estimation.
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 thecase.*	• Mr Teakle has visited the Thunderbird site and the primary assay laboratory on numerous occasions during 2012 - 2015 during operations. • Mrs Standing has not visited the Thunderbird site. • Where material, information relating to observations from these visits has been included in this announcement.
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.*	• As described above, geologists have defined three stratigraphic units within the deposit area using a combination of surface mapping and drill hole lithological logs. For the purposes of resource estimation, these units were used incombination with grade criteria to define four mineralised domains, as follows: - B1 (north) and B2 (south): within Reeves Fm., grade criteria >1% HM, >6mwidth, >6m separation stratigraphically above the Thunderbird Fm. - T1: Thunderbird Fm., grade criteria: HM >1-2% and <7.5-10%, >6m width, <6m internal waste

		- T2: Thunderbird Fm. GT Zone within T1, grade criteria HM >7.5-10%, >6mwidth, <6m internal waste, marked change in HM grade at boundary • Domain boundaries are guided by grade rules; however, geological continuity overrides grade rules where necessary. It is useful to note, however, that primaryHM% (and SL% and OS%) is a physical characteristic of the geological units related to unit deposition. • There is good confidence in the geological interpretation of the deposit. Logged data from 670 drill holes as well as surface geology has been used to develop the interpretation and this is supported by HM%, slimes% and oversize% assays. Theresult is excellent geological (and grade) continuity in the model (see diagrams above), as expected for this style of HM deposit. • The resource T1 domain imposes an approximate 1-2% HM cut-off on the resource, and at its upper boundary corresponds closely with a natural geologicalboundary (between Melligo and Thunderbird Formations). This allows higher cut-off grades (e.g. 3% as reported) to be applied, and as such any change to this boundary is unlikely to significantly affect the Mineral Resource as reported.
Dimensions	• *The extent and variability of the Mineral Resource expressedas length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.*	• At 3% HM cut-off the resource block model covers an area about 8km long by 3km to 6.5km wide, and remains open in all directions. The mineralisation occurs as a thick, broad anticlinal sheet-like body striking northwest, extending from surface to a maximum depth of up to 136m. For the main body of the resource (i.e. excluding small isolated pods of mineralisation) the average depth to the top of mineralisation is 24m (range 0m to 84m) and the average mineralised thicknessis 42m (range 2m to 85m). The dip of the deposit changes from flat to low angle along the north-eastern flank, to 4 degrees along the south-western flank, resulting in around 31% of the total resource area occurring within 6m of surface. • At 7.5% HM cut-off the resource block model covers an area about 8km long by 2.5km to 6.5km wide, and remains open to the north and south. The mineralisationfollows the dip of the resource above 3% HM but strikes north-south, extending from surface to a maximum depth of 124m. For the main body of the resource (i.e.excluding small isolated pods of mineralisation) the average depth to the top of mineralisation is 35m (range 0m to 90m) and the average mineralised thickness is 16m (range 1m to 46m). Approximately 28% of the >7.5% HM resource area is within 15m of 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, interpolationparameters 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.*	• Heavy mineral (HM), slimes and oversize quantities were estimated using ordinarykriging (OK) into blocks of 50m East by 200m North by 3m RL. Zircon, HiTi leucoxene, leucoxene, ilmenite and 'other' material percentages were estimated using inverse distance (ID) into the parent blocks. Block dimensions were selected from kriging neighbourhood analysis and reflect the variability of the deposit and the model's practicality for future mine planning. Sub-cells to a minimum dimension of 50m E by 50m N by 0.5m RL were used to represent

	• *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 minedrainage 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.*	volume. For the definition of the topographical surface and soil horizon (of 20 cm)sub-celling was reduced to 5 mE by 10 mN by 0.2 mRL. • The nominal drill spacing is approximately 250m x 500m, with the margins of the deposit drilled at a spacing of 500m x 500m and 1000m x 500m. Infill drilling in the area where the high grade domain outcrops at surface, conducted as part of the 2014 drilling campaign, has reduced the nominal spacing to 125m x 250m. Four separate close-spaced 'crosses' have been drilled at a nominal spacing of 60m both along and across strike. • Data analysis and estimation was undertaken using Snowden Supervisor and Datamine software. • Drill samples were composited to 1.5m for estimation. • Wireframe interpretations of mineralisation were made by SFX based on geological logging and heavy mineral (HM) content, using thresholds of ~1% HMto define a low grade domain and 7.5% HM to define a high grade domain. • Optiro assessed the robustness of these domains by critically examining the geological interpretation and by using a variety of measures, including statistical and geostatistical analysis. The domains are considered geologically robust in thecontext of the resource classification applied to the estimate. • All variables were estimated separately and independently. • Hard boundaries were applied to the estimation of HM within mineralisation domains and a combination of hard and soft boundaries were applied for the estimation of SL, OS and the VHM components. • Grade capping was applied to HM%, SL% and OS%. The top cut levels were determined using a combination of top cut analysis tools, including grade histograms, log probability plots and the coefficient of variation. • Variogram analysis was undertaken to determine the kriging estimation parameters used for OK estimation of HM, slimes and oversize and the searchdimensions used for ID estimation of the VHM components. • HM mineralisation continuity was interpreted from variogram analyses to have analong strike range of 1,300m and an across strike range of 600 m. • The VHM continuity was interpreted from variogram analyses to have an alongstrike range of 1,350m and an across strike range of 600 m. • Kriging neighbourhood analysis was performed in order to determine the blocksize, sample numbers and discretisation levels. • Three estimation passes were used for HM; the first search was based upon the variogram ranges; the second search was 2 times the initial search and the third search was up to 6 times the initial search, with reduced sample numbers requiredfor estimation. The majority of blocks (67%) were estimated in the first pass, 22% in the second pass and 10% in the third pass. • The HM, slimes and oversize estimated block model grades were visually validated against the input drill hole data and comparisons were carried out

		against the declustered drill hole data and by northing, easting and elevationslices. • The VHM estimated block model grades were visually validated against the input drill hole data and comparisons were carried out against the drill hole data and bynorthing and easting slices.
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.*	• The Mineral Resource estimate for the Thunderbird deposit has been reported at a3% HM and 7.5% HM cut-off. These cut-off grades were selected by Sheffield based on technical and economic assessment carried out during Pre-Feasibility studies. Optiro has reviewed the parameters used to support these cut-offs grades and believe them to be reasonable. • At a 3% HM cut-off, the HM grade of the Thunderbird Resource is 6.9% and the insitu VHM grade is approximately 2.9%. This compares favourably with other HMSdeposits either recently or currently being mined. • The 7.5% HM cut-off has been chosen to represent the very-high grade, continuous component of the Mineral Resource, which may become the starting point of any future mining operations. In addition, spatially the 7.5% HM threshold is associated with a grade-geological boundary throughout the deposit, which wasdomained separately for the purposes of resource estimation. • The grade-tonnage curve is included in the body of the announcement to show theimpact of cut-off grade versus total resource tonnage.
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 theprocess 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.*	• In determining the criteria for reasonable prospects for eventual economic extraction, potential mining methods considered are either dry-mining dozer-trap, or dredge mining operations, similar to those commonly and currently in use in HMmining operations both in Australia and globally. • The thickness, areal extent, and continuous nature of the mineralisation at Thunderbird are such that both selective and non-selective bulk mining methodscan be appropriately considered. • These assumptions were also considered when determining resource block sizes,and resource classification. • In addition, Sheffield has previously announced positive financial results from aPre-Feasibility Study (see ASX announcement dated 14 October 2015), anOre Reserve (see ASX announcement dated 22 January 2016 and 16 March 2017) and BFS Update and Update Ore Reserve 31 July 2019 for Thunderbird. • On the basis of these assumptions, the Company considers there are no miningfactors which are likely to affect the assumption that the deposit has reasonableprospects for eventual economic extraction.

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 eventualeconomic 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 isthe case, this should be reported with an explanation of the basis of the metallurgical assumptions made.*	• As discussed earlier in this table, and in the body of the announcement, the Company has conducted bulk process metallurgical studies on 6t, 5t and 12.5t bulk samples from Thunderbird for the purpose of developing a process flowsheetfor the deposit. The results of this work were used to design and optimise the method used to determine the HM assemblage reported in the Mineral Resource. • The results of this work are sufficient for the Company to expect that the Thunderbird mineralisation will be amenable to treatment with conventional mineral sands processing techniques. • Sheffield has previously announced positive results relating to product processingand marketing in its Thunderbird Pre-Feasibility Study (see ASX announcement dated 14 October 2015) and Bankable Feasibility Study (see ASX announcementdated 24 March 2017). • On the basis of these studies, the Company considers there are no metallurgical factors which are likely to affect the assumption that the deposit has reasonable prospects for eventual economic extraction.
Environmental factors or assumptions	• *Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of theprocess of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at thisstage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potentialenvironmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.*	• The Company has completed Level 1 and Level 2 flora and fauna surveys at Thunderbird, and hydrogeological investigations. • On the basis of these studies, the Company considers there are no environmental factors which are likely to affect the assumption that the deposit has reasonable prospects for eventual economic extraction.
Bulk density	• *Whether assumed or determined. If assumed, the basis forthe assumptions. If determined, the method used, whetherwet or dry, the frequency of the measurements, the nature,size and representativeness of the samples.* • *The bulk density for bulk material must have been measuredby 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 measurements of mineralisation were made during the large diameter Bauer drilling program (see ASX announcement dated 17 September 2015) through approximately 100t combined of topsoil, mineralised and non-mineralised materials. • The results of this work confirmed the bulk density values predicted from an industry-standard formula (used in previous resource estimates at Thunderbird) which accounts for the HM and slimes content of heavy mineral sand deposits. • This formula has been applied to predict bulk density for the 2016 resource estimate.
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*	• The estimate has been classified according to the guidelines of the JORC Code (2012), into Measured, Indicated and Inferred Resources taking into account dataquality, data density, geological continuity, grade continuity and confidence in estimation of heavy mineral content and mineral assemblage. In plan, polygons were used to define zones of different classification.

	and metal values, quality, quantity and distribution of the data). • *Whether the result appropriately reflects the Competent Person's view of the deposit.*	• Measured Resources encompass an area inclusive of the 125m by 250m infill drilling and the four separate 'crosses' of close-spaced drilling, where drill spacingis 60m along strike and 60m across strike. • Indicated Resources are defined where drilling is at 500m centres along strike by 250m. • Inferred Resources are defined around the margins of Indicated Resource, where the drill spacing is 500m by 500m.
Audits or reviews	• *The results of any audits or reviews of Mineral Resource estimates.*	• The Mineral Resource has been audited internally as part of normal validation processes both by the Company and Optiro. • No external audit or review of the current Mineral Resource has been conducted.
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 statisticalor 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 discussionof the factors that could affect the relative accuracy and confidence of the estimate.* • *The statement should specify whether it relates to global orlocal 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 assigned classification of Measured, Indicated and Inferred reflects the Competent Persons' assessment of the accuracy and confidence levels in theMineral Resource estimate. • The confidence levels reflect production volumes on a monthly basis. • No production has occurred from the deposit.

Section 4 Estimation and Reporting of Ore Reserve

Criteria	JORC Code explanation	Commentary
Mineral Resource estimate for conversion to Ore Reserves	• *Description of the Mineral Resource estimate used as a basis forthe conversion to an Ore Reserve.* • *Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserve.*	• This Ore Reserve is based entirely on the Measured and Indicated portionof the current reported Mineral Resources at Thunderbird (previously released on 5 July 2016 details are available at www.sheffieldresources.com.au). • Mineral Resources are reported inclusive of the Ore Reserve.
Site visits	• *Comment on any site visits undertaken by the Competent Personand the outcome of those visits.* • *If no site visits have been undertaken indicate why this is thecase.*	• The competent person has not visited the site. • The competent person is comfortable relying on reports from other independent consultants who have visited site and other operations in thearea respectively.
Study status	• *The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.* • *The Code requires that a study to at least Pre-Feasibility Study level has been undertaken to convert Mineral Resources to OreReserves. Such studies will have been carried out and will havedetermined a mine plan that is technically achievable and economically viable, and that material Modifying Factors havebeen considered.*	• The study supporting the Ore Reserve has been completed to a bankable feasibility level. • Modifying factors accurate to the study level have been applied. The resulting mine plan is technically achievable and economically viable.
Cut-off parameters	• *The basis of the cut-off grade(s) or quality parameters applied.*	• An updated cost/value model was formulated that follows the entire process chain and applies cost, recovery, and revenue multipliers at appropriate stages throughout the process to derive block values. This value model was used for verification pit optimisation studies to confirm the economic material classification, overburden and pit design surfaces used in prior studies remain valid for the current study inputs. Comparison of revenue and cost per ore tonne with the final financial model demonstrate similar revenue / cost ratios between models. • This model was used, together with the Whittle Consulting recommended mine sequence and discard strategy as a basis for guiding ore and waste discrimination in the design process. In general, lower grade T1 material is discarded to waste early in the project and increasing amounts are incorporated as process feed as mining progresses into regions of higher strip ratio. • The mining pathway also limits the amount of oversize material mined during the first 4 years of operation whilst single MUP is in use.
Mining factors or assumptions	• *The method and assumptions used as reported in the Pre- Feasibility or Feasibility Study to convert the Mineral Resource toan Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).*	• Open pit optimisation studies were conducted using Datamine Studio NPVS software to generate Lerch-Grossman shells. The Resource Model used as a basis for these studies was tb_fnal160708.dm. An initial high margin area was selected that provided an approximate 8 year production inventory. Detailed design and scheduling was undertaken in this area including individual mining block definition and sequencing. Beyond this area, a life

	• *The choice, nature and appropriateness of the selected mining method(s) and other mining parameters including associated design issues such as pre-strip, access, etc.* • *The assumptions made regarding geotechnical parameters (e.g.pit slopes, stope sizes, etc.), grade control and pre-production drilling.* • *The major assumptions made and Mineral Resource model usedfor pit and stope optimisation (if appropriate).* • *The mining dilution factors used.* • *The mining recovery factors used.* • *Any minimum mining widths used.* • *The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the outcome to their inclusion.* • *The infrastructure requirements of the selected mining methods.*	of mine design has been completed. Scheduling beyond the initial pit areais undertaken on coarser 600m dimension zones, consistent with the strategic schedule zones as defined by Whittle Consulting. • Bulk mining techniques have been chosen for ore mining, incorporating dozer traps and in-pit feed preparation units. Topsoil and overburden will be excavated, hauled and stockpiled using conventional earthmoving equipment. Following excavation and classification ore will be slurried andpumped to a nearby wet concentration plant. Oversize reject from feed preparation units will be rehandled using front end loader within the mine void. • The selected mining method is considered appropriate to the large, relatively thick, and sheet-like characteristics of the host sand unit. Minimalpre-strip is required to access the orebody. The Life-of-Mine average strip ratio (waste: ore) is 0.81: 1.00. • Independent consultants prepared the geotechnical analysis that forms the basis of pit design criteria including excavatability, trafficability and pit slope wall angles. The overall wall angles have been designed at 34 degrees based on geotechnical review of excavated trial mining pits in 2020 and 2021. • A series large diameter Bauer holes, costeans and two trial mining pits were excavated to furtherassess geotechnical aspects. • A mining recovery factor of 98% was applied. No mining dilution factor is applied due to the bulk, non-selective nature of the deposit and proposed mining method. Overburden mining takes place prior to exposing the underlying ore and is therefore a spatially discrete mining activity. Minimum mining width considerations are not applicable given the dimensions of the mining blocks guiding pit design. A 0.2m topsoil depth has been allowed for and recovered material excludes material designated as topsoil. • Only minor amounts of Inferred Mineral Resource occur within the mine design (0.1Mt) at the periphery of the final life-of-mine pit design. Inferredmaterial is excluded from Ore Reserve reporting and the reporting of this material in the mine plan has no material impact on the economics supporting the Ore Reserve. • The following infrastructure will be required to support the mining method and is included in the capital and operating cost estimate: Mining Units Plant “MUP”, Wet Concentration Plant “WCP”, Concentrate Upgrade Plant “CUP”, Non Magnetic Finisher Circuit Plant “NMFC”, site buildings, bore field, power station and power distribution infrastructure, new and upgraded roads accommodation village, upgraded materials handling at Port of Derby. KMS has selected the Port of Derby as its base case solution and intends to examine the use of Port of Broome as an opportunity to lower operating risk.

Metallurgical factors or assumptions	• *The metallurgical process proposed and the appropriateness ofthat process to the style of mineralisation.* • *Whether the metallurgical process is well-tested technology ornovel in nature.* • *The nature, amount and representativeness of metallurgical testwork undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied.* • *Any assumptions or allowances made for deleterious elements.* • *The existence of any bulk sample or pilot scale test work and the degree to which such samples are considered representative of the orebody as a whole.* • *For minerals that are defined by a specification, has the ore reserve estimation been based on the appropriate mineralogy tomeet the specifications?*	• The metallurgical process was developed to a bankable feasibility studylevel including the development of a flowsheet and capital and operatingcosts. The flowsheet consists of the following: * Feed Preparation Plant "FPP" * Wet Concentration Plant "WCP" * Concentrate Upgrade Plant "CUP" * Non Magnetic Finisher Circuit "NMFC" The developed process flow sheet is deemed appropriate for the style of mineralisation. • The process stages are based on well understood conventional unit processes and has been developed using best in class full scale or scale-able equipment. There are no un-tested novel processes or equipment used within the flowsheet. Extensive test work has confirmed the processflowsheet is effective in achieving high recoveries from the ore. • Extensive metallurgical processing test work has been completed on four bulk samples (comprising samples of 6.0t, 5.0t 12.5t, 40t and 25t selected from full scale dozer rip and push method). • Process mineral recoveries have been increased in three phases to reflect a commissioning ramp up to target operating recoveries. Discounted recoveries have been applied in production years 1, 2 and 3. Overall financial model recovery factors are derived from the metallurgical test work and the modelled LOM recoveries are 79.3% for Zircon to NMC and 84.6% for ilmenite to MC and these include the assumption of a 3% loss of HM in the Feed Preparation Plant as proposed by debt Independent Technical Review • Products produced from metallurgical test work, all meet typicalmarket requirements and no assumptions regarding product quality or deleterious elements have been made. • Characterisation of head samples, intermediate samples and final products to determine mineralogy has been based on the same process as applied for the drill sample analyses. This method includes oversize determination, slimes determination, heavy mineral determination, magnetic fractionation of heavy mineral and XRF/QEMSCAN analyses on resultant fractions. • Mineral characterization data derived from bulk sample data is aligned with mineral characterization data derived from drill sample data. As such bulk samples tested are aligned with domain data associated with bulk sample origin and are representative of the orebody. • Final product analyses are based on XRF analyses and detailed QEMSCAN analyses which is the same as for the Ore Reserve
Environmental	• *The status of studies of potential environmental impacts of the mining and processing operation. Details of waste rock*	• All environmental approvals from State and Federal Government have been received. This includes:

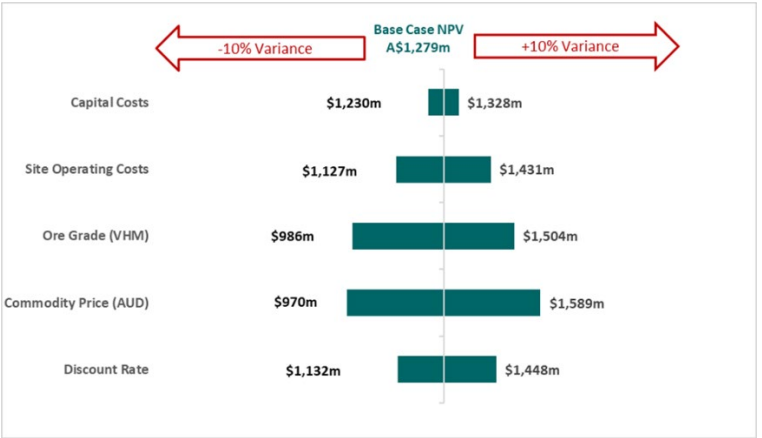
	characterisation and the consideration of potential sites, status of design options considered and, where applicable, the status of approvals for process residue storage and waste dumps should be reported.	○ Ministerial Statement 1080, ○ Department of Water and Environmental Works Approval ○ License to taker Water GWL201977(1) ○ Australian Government Department of Environment and EnergyEPBC approval 2018-7648 • Mining and transportation methods are not new and are commonly used throughout Australia. • Thunderbird Operations Pty Ltd has undertaken significant investigation and consultation to confirm environmental issues and stakeholder concerns. • Secondary approvals are well understood and a strategy has been definedand implemented to ensure these are obtained in time for construction andoperation. • Thunderbird Operations Pty Ltd has systems in place to make sure community concerns andenvironmental issues are managed • Mine waste characterisation demonstrates that overburden material arising from the Project is extremely benign and represents no risk to the surrounding environment. In addition, mine waste arising from depths up to 48.5m below the water table do not present an acid-forming risk. Some potentially acid forming material is present >48.5m below the water table; however, these materials will not be encountered until approximately 35 years from commencement of mining and are not considered to be extensive and not expected to require complex management measures to be implemented. Analysis of process residue demonstrates it is non-acid forming and is completely benign.
Infrastructure	• *The existence of appropriate infrastructure: availability of land for plant development, power, water, transportation (particularly for bulk commodities), labour, accommodation; or the ease with which the infrastructure can be provided, or accessed.*	• The site is located 98km northeast of Broome and 72km west of Derby in Western Australia. There is currently no substantial on-site infrastructure, and the study estimates the costs for the development of all necessary infrastructure items.
Costs	• *The derivation of, or assumptions made, regarding projected capital costs in the study.* • *The methodology used to estimate operating costs.* • *Allowances made for the content of deleterious elements.* • *The source of exchange rates used in the study.* • *Derivation of transportation charges.* • *The basis for forecasting or source of treatment and refining charges, penalties for failure to meet specification, etc.* • *The allowances made for royalties payable, both Governmentand private.*	• The process plant capital costs have been informed by an EPC agreement with GR Engineering Services (GRES) to engineer, procure and construct (EPC) the Stage 1 processing plant and processing infrastructure based ona process design and PFDs, mechanical equipment lists and plant and an overall mine site layout, which has been reviewed and agreed with Thunderbird Operations Pty Ltd, GRES and the debt provider's independent technical experts. The EPC agreement with GRES also includes recovery and performance test guarantees. Non-processing plant infrastructure and owners costs were estimated by Thunderbird Operations Pty Ltd using negotiated final agreements, industry sources or in-house estimation and expertise to determine the non–process plant infrastructure direct costs. Engineering estimates has been developed for the future expansion of the Project.

- Capital costs for the Stage 2 upgrade expansions were estimated on a factored basis to replicate the current plant area and utilise common or expended elements within the Stage 1 plant area where appropriate to do so.
- Ore mining and feed preparation costs are informed by tendered fixed and variable schedule of rates with an experienced mineral sand mining contractor. Ore mining and feed preparation costs include all ore mining, feed preparation and pumping of ore to the processing plant.
- The cost for land clearing, waste mining, tailings storage and other ancillary activities were estimated by Entech with plant rates updated in March 2021, tyres in May 2021 and labour rates in September 2021 cost basis on the following information and assumptions:
    - Local base salary labour rates that are representative of typical labour costs within the region.
    - Labour on-costs include allowances for superannuation, payroll tax, workers compensation insurance premiums and recruitmentand relocation costs and are representative of similar operationsin the same region of Western Australia;
    - Net diesel fuel cost of A$0.95 per litre after allowing for rebate;
    - Equipment productivities calculated by Entech in consultation with industry experts and mining contractors;
    - Mining costs estimated by Entech in consultation with industry experts, equipment suppliers and mining contractors; and
    - Equipment ownership and operating costs as provided by equipment suppliers in consultation with Entech.
- Central to the development of the Processing Plant operating costs are Mechanical Equipment lists (to assess power demand), manning schedules (to assess operating labour), mobile equipment and duty schedules (to assess fuel demand) and supporting calculations for all otherconsumables (such as reagents, flocculants etc.).
- Power and LNG prices are informed on tendered and negotiated agreements and evaluated by Thunderbird Operations Pty Ltd and third party consultants.
- General and administration operating costs were built up on a first principles basis from manning schedules, labour work rosters (DIDO), quotations for the supply and operation of on-site village facilities, light vehicle and mobile equipment requirements and associated leasing and running costs and other administration-related fixed costs such as communications, IT, consultants, recruitment, annual tenement costs andthe like.
- All cost estimates have been prepared on Australian Dollar basis

		• All infrastructure components and consumables are assumed delivered to site at estimated road haulage rates. • There are no additional treatment or refining charges applied, and minerals are sold as finished products. • All products are bulk. Suitable provision has been made for, transportation, storage, loading to ocean going vessels and port charges. • An appropriate allowance has been made for Western Australian State and Native Title royalties. All royalties are applied as a % of gross revenue. • Detailed mine planning was performed over the first 4 year of the mine life and compared to the KMS BFS mining costs. These compared to within 3%.

Revenue factors	• *The derivation of, or assumptions made regarding revenue factors including head grade, metal or commodity price(s) exchange rates, transportation and treatment charges, penalties,net smelter returns, etc.*
	• *The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.*
		• The revenue is a function of block modelled grade and mineral assemblage, modelled comprehensively through the mining, mineral processing, and transportation chain where it is expected to be delivered toan off taker at a forecast price.
		• An A$/US$ exchange rate of 0.75 is assumed for the life of mine, based on Consensus forecasts.
		• Thunderbird Operations Pty Ltd has applied TZMI's long term pricing assumptions for Thunderbird Non Magnetic Concentrate, Paramagnetic Concentrate and Magnetic Concentrate products.
		• Prices have been converted from CIF to FOB. Conversion from CIF to FOBfor non magnetic concentrate has assumed current ocean going rates of US$40 per tonne for 10,000t shipments of zircon concentrate to China. Rates of US$17 per tonne have been assumed for 20,000t shipments of magnetic concentrates to the main ports in China.
		• Prices for products on a FOB basis are as follows:
		  ○ Magnetic concentrate average price of US$130 per tonne for CY2024 - CY2027 then a long term price of US$128 per tonne for 38.5% TiO_2 content
		  ○ Non Magnetic Concentrate US$881 per tonne (CY2024)
		  ○ Non Magnetic Concentrate US$871 per tonne (FY2025)
		  ○ Non Magnetic Concentrate US$755 per tonne (beyond)
		• The Paramagnetic Concentrate is priced from TZMI on a long term price of US$214/ tonne. The PMc is diluted by a factor of 2.06 to reduce product to below 10bq/g for shipping. Prices below are based on a diluted tonnage.

		○ Paramagnetic Concentrate US$113 per tonne (CY2024) ○ Paramagnetic Concentrate US$109 per tonne (CY2025). ○ Paramagnetic Concentrate US$104 per tonne (beyond).
Market assessment	• *The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supplyand demand into the future.* • *A customer and competitor analysis along with the identificationof likely market windows for the product.* • *Price and volume forecasts and the basis for these forecasts.* • *For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.*	• In relation to Ilmenite supply and demand, TZMI report that global pigment production is expected to increase 1.9% Compound Annual Growth Rate (CAGR) from 7.3 million tonnes in 2021 to 8.7 million tonnes by 2030, with supply deficit expected in the sector in the near to medium term. • In relation to Zircon supply and demand, TZMI forecast global demand in 2021 is estimated to rise 17% annually to 1.19 million tonnes and in the nine year period following 2021 the CAGR is forecast at 2.9% or 1.5 million tonnes by 2030. • Market analysis by consumer groups supports comments that non magnetic concentrate contains 40% premium quality zircon suitable for the ceramic market. Magnetic Concentrate is suitable to be sold into the chloride slag feedstock market which is evidenced by the recent signing of a binding offtake agreement for this application. • Key regional markets for supply of all products include China, India, and Europe as primary target markets. Thunderbird Operation Pty Ltd plans on supplying an average of 200kt per annum of Non Magnetic Concentrate in years 2 to 4, with an increase to an average of 436kt per annum from years 5 to10 and an average of 302kt per year from year 11 onwards. • The key target market for Thunderbird 's Paramagnetic Concentrate is the Chinese concentrate processing market. Thunderbird plans on supplying an average of 90kt (metric tonnes) per annum of Paramagnetic Concentrate in years 2 to 4, with an increase to an average of 186kt per annum from years 5 to 10 and an average of 130kt per year from year 11 onwards. • Key major primary markets for supply Magnetic Concentrate is into China, under the binding offtake agreement with Yansteel. Thunderbird plans on supplying an average of 720kt (metric tonnes) per annum of Magnetic Concentrate in years 2 to 4, with an increase to an average of 1,540kt per annum from years 5 to 10 and an average of 1,080kt per year from year 11 onwards. • TZMI have reviewed the proposed product specifications of the Thunderbird products and have verified that they will meet various market uses and typical specifications required for those markets. • Thunderbird has binding off take agreements in place for Non Magnetic concentrate and Magnetic Concentrate for ~80% of the revenue in Stage 1.

Economic	• *The inputs to the economic analysis to produce the net present value (NPV) in the study, the source and confidence of these economic inputs including estimated inflation, discount rate, etc.* • *NPV ranges and sensitivity to variations in the significant assumptions and inputs.*	• For the purpose of estimating an Ore Reserve, a NPV was estimated at a pre financing and post tax discount rate of 8%. The confidence in the inputs is consistent with a Bankable Feasibility level of study. The project demonstrated a positive NPV. • Financial outcomes of the KMS Bankable Feasibility Study were tested by varying revenue, cost and macro-economic factors. These factors include commodity price, costs (both operating and capital), production volume and ratios, along with economic discount factors. Positive outcomes for NPV, IRR and cash flow were generated in all cases to support the Ore Reserve estimate 
Social	• *The status of agreements with key stakeholders and matters leading to social licence to operate.*	• Engagement with key stakeholders, including Traditional Owners, pastoralists and government agencies, has been ongoing and will continue in parallel with funding processes, construction activities and project operations. • A comprehensive Heritage Survey with Traditional Owners was completed in 2016 over the proposed area of mining operations and associated infrastructure. • The Company has agreed with Traditional Owners to observe a number of Aboriginal heritage exclusion zones around the edges of the deposit, one of which overlaps the Ore Reserve. This is not considered to have a material effect on the Ore Reserve as it does not occur until late in the life of mine schedule, and the mine plan is technically and economically viable without the inclusion of this area.

		• The Company executed a Co-existence agreement with the Traditional Owners in October 2018. The Co-existence Agreement establishes the framework by which the Company can work with the Traditional Owners to protect Aboriginal heritage and the environment while delivering sustainable employment and business outcomes for Traditional Owners and the wider Aboriginal community. • In 2018, an ethnographic site was registered over the Mining Lease by a third-party non-member of the Mt Jowlaenga Polygon #2 Named Applicants, which is now part of the Joombarn Buru Native Title Determination. This was addressed via a Section 18 process under the Aboriginal Heritage Act, 1972, in consultation and with the consent of Mt Jowlaenga Polygon #2 Named Applicants and the Kimberley Land Council (KLC).
Other	• *To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:* • *Any identified material naturally occurring risks.* • *The status of material legal agreements and marketing arrangements.* • *The status of governmental agreements and approvals critical tothe viability of the project, such as mineral tenement status, and government and statutory approvals. There must be reasonable grounds to expect that all necessary Government approvals will be received within the timeframes anticipated in the Pre- Feasibility or Feasibility study. Highlight and discuss the materiality of any unresolved matter that is dependent on a third party on which extraction of the reserve is contingent.*	• All naturally occurring risks are assumed to have adequate prospects for control and mitigation. • The sale ~80% of the revenue in Stage 1 of the Project as covered by binding off take agreements. • The Thunderbird deposit is within Exploration License E04/2083, held 100% by Thunderbird Operations Pty Ltd, and due to expire on 04/09/2023. • Thunderbird has received the Mining Lease 04/459 for mining and processing operations, and miscellaneous licenses L04/82, L04/83, L04/84, L04/85 and L04/86 for ancillary infrastructure.
Classification	• *The basis for the classification of the Ore Reserves into varying confidence categories.* • *Whether the result appropriately reflects the Competent Person'sview of the deposit.* • *The proportion of Probable Ore Reserves that have been derivedfrom Measured Mineral Resources (if any).*	• The Proved and Probable Ore Reserve is based on that portion of the Measured and Indicated Mineral Resources respectively within the mine designs that may be economically extracted. • The result appropriately reflects the Competent Persons view of the deposit.
Audits or reviews	• *The results of any audits or reviews of Ore Reserve estimates.*	• No external audit of the Ore Reserve estimate has been undertaken. Independent technical experts have been engaged to provide due diligence work for the debt providers. This work has not identified any fatal flaws in the Project.

Discussion of relative accuracy/ confidence	• *Where appropriate a statement of the relative accuracy and confidence level in the Ore Reserve estimate using an approach or procedure deemed appropriate by the Competent Person. Forexample, the application of statistical or geostatistical proceduresto quantify the relative accuracy of the reserve within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors which 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 shouldbe relevant to technical and economic evaluation. Documentationshould include assumptions made and the procedures used.* • *Accuracy and confidence discussions should extend to specific discussions of any applied Modifying Factors that may have a material impact on Ore Reserve viability, or for which there are remaining areas of uncertainty at the current study stage.* • *It is recognised that this may not be possible or appropriate in all circumstances. These statements of relative accuracy and* • *confidence of the estimate should be compared with productiondata, where available.*	• This Ore Reserve is attributed a confidence classification of “Proved” and "Probable" Ore Reserve. There is a degree of uncertainty associated withthe Mineral Resource estimate and the modifying factors. • Overall accuracy of the operating and Stage 1 capital cost estimate is considered to be -10% to +10%. Accuracy of the Stage 2 capital cost estimate is considered to be +/- 25%. • Stress testing of operating cashflow shows this remains positive well beyond the stated accuracy of the cost estimates. • No production data is available against which the Ore Reserve estimatesmay be reconciled. • The geotechnical pit slope assumptions are based on depth of pits to 60 to70 metres. The final pit design reaches a depth of approximately 100m. An overall wall slope angle of 34 degrees has been used. • The low strip ratio of the Ore Reserve means this is low risk to Project economics, but further geotechnical work is recommended once open pitmining has occurred and wall exposures are monitored.

Appendix B: Thunderbird Deposit Mineral Resource 5 July 2016

Thunderbird Deposit Mineral Resource Summary

Resource Category	Cut-off HM%	Mineral Resources		Valuable HM Grade (In-situ)				
		Material Million Tonnes	HM %	Zircon %	HiTi Leucoxene %	Leucoxene %	Ilmenite %	Total VHM %
Measured	3.0	510	8.9	0.71	0.20	0.19	2.4	3.5
Indicated	3.0	2,120	6.6	0.55	0.18	0.20	1.8	2.8
Inferred	3.0	600	6.3	0.53	0.17	0.20	1.7	2.6
Total	**3.0**	**3,230**	**6.9**	**0.57**	**0.18**	**0.20**	**1.9**	**2.9**
Measured	7.5	220	14.5	1.07	0.31	0.27	3.9	5.5
Indicated	7.5	640	11.8	0.90	0.28	0.25	3.3	4.7
Inferred	7.5	180	10.8	0.87	0.27	0.26	3.0	4.4
Total	**7.5**	**1,050**	**12.2**	**0.93**	**0.28**	**0.26**	**3.3**	**4.8**

Thunderbird Deposit Mineral Resource

Resource Category	Cut off (HM%)	Mineral Resources						Mineral Assemblage			
		Material (Mt)	Bulk Density	HM %	Slimes %	Osize %	In-situ THM (Mt)	Zircon %	HiTi Leuc %	Leuc %	Ilmenite %
Measured	**3.0**	510	2.1	8.9	18	12	45	8.0	2.3	2.2	27
Indicated	**3.0**	2,120	2.0	6.6	16	9	140	8.4	2.7	3.1	28
Inferred	**3.0**	600	2.0	6.3	15	8	38	8.4	2.6	3.2	28
Total	**3.0**	3,230	2.0	6.9	16	9	223	8.3	2.6	2.9	28
Measured	**7.5**	220	2.1	14.5	16	15	32	7.4	2.1	1.9	27
Indicated	**7.5**	640	2.1	11.8	14	11	76	7.6	2.4	2.1	28
Inferred	**7.5**	180	2.0	10.8	13	9	20	8.0	2.5	2.4	28
Total	**7.5**	1,050	2.1	12.2	15	11	127	7.6	2.3	2.1	27

Thunderbird Deposit contained Valuable HM (VHM) Resource Inventory

Resource Category	Cut off (HM%)	Zircon (kt)	HiTi Leucoxene (kt)	Leucoxene (kt)	Ilmenite (kt)	Total VHM (kt)
Measured	**3.0**	3,600	1,000	1,000	12,000	17,700
Indicated	**3.0**	11,800	3,800	4,300	39,100	59,000
Inferred	**3.0**	3,200	1,000	1,200	10,500	15,900
Total	**3.0**	18,600	5,900	6,500	61,700	92,600
Measured	**7.5**	2,300	700	600	8,400	12,000
Indicated	**7.5**	5,800	1,800	1,600	21,000	30,200
Inferred	**7.5**	1,600	500	500	5,600	8,200
Total	**7.5**	9,700	3,000	2,700	35,000	50,400

Notes: Mineral Resources are reported inclusive of (not additional to) Ore Reserves. Mineral Resources reported above 3% HM cut-off are inclusive of (not additional to) the Mineral Resource reported above 7.5% HM cut-off.
All tonnages and grades have been rounded to reflect the relative accuracy and confidence level of the estimate, thus sum of columns may not equal.
The in-situ grade is determined by multiplying the percentage of total HM by the percentage of each valuable heavy mineral within the heavy mineral assemblage at the resource block model scale.
Estimates of Mineral Assemblage are presented as percentages of the total heavy mineral (THM) component of the deposit, as determined by magnetic separation, QEMSCAN and XRF. Magnetic fractions were analysed by QEMSCAN for mineral determination as follows: Ilmenite: 40-70% TiO_2 >90% Liberation; Leucoxene: 70-94% TiO_2 >90% Liberation; High Titanium Leucoxene (HiTi Leucoxene): >94% TiO_2 >90% Liberation; and Zircon: 66.7% ZrO_2+HfO_2 >90% Liberation. The non-magnetic fraction was submitted for XRF analysis and minerals determined as follows: Zircon: ZrO_2+HfO_2/0.667 and High Titanium Leucoxene (HiTi Leucoxene): TiO_2/0.94.

ABOUT SHEFFIELD RESOURCES

Sheffield Resources Limited is focused on developing the world class Thunderbird Mineral Sands Project, located in north-west Western Australia.

ABOUT YANSTEEL

Yansteel is a wholly-owned subsidiary of Tangshan Yanshan Iron & Steel Co., Ltd, a privately owned steel manufacturer headquartered in Hebei, China producing approximately 10mt per annum of steel products and has annual revenues of ~A$6bn.

Construction of a 500ktpa integrated titanium dioxide processing facility including a titanium slag smelter has commenced by the company. This complex will consume the magnetic concentrate from Stage 1 of the Thunderbird Mineral Sands Project under a take or pay offtake agreement.

THUNDERBIRD MINERAL SANDS

Thunderbird is one of the largest and highest grade mineral sands discoveries in the last 30 years. The 2022 KMS Bankable Feasibility Study shows Thunderbird is a technically low risk, that generates strong cash margins from globally significant levels of production over a decades long mine-life.

Thunderbird will generate a high-quality suite of mineral sands concentrate products suited to market requirements. These products include a zircon concentrate and a magnetic concentrate that contains a high quality ilmenite suitable smelting into chloride slag or for manufacturing titanium dioxide pigment.

Thunderbird is located in one of the world's most attractive mining investment jurisdictions and is well placed to deliver long term, secure supply of high quality products to a range of potential customers.

KIMBERLEY MINERAL SANDS

Kimberley Mineral Sands Pty Ltd, (KMS) is a 50:50 Joint Venture between Sheffield and Yansteel. The joint venture owns and is developing the Thunderbird Mineral Sands Project and adjacent tenements on the Dampier Peninsula.

KMS is governed by a four person Board of Directors with Sheffield and Yansteel each nominating two directors. Key Joint Venture decisions require unanimous approval of both shareholders. KMS operates as a standalone entity with its own management and employees.