Sheffield Resources LIMITED

The Emerging Force in Mineral Sands

June 2019
Joint Pilbara Kimberley Forum

ASX:SFX | sheffieldresources.com.au

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COMPETENT PERSONS AND COMPLIANCE STATEMENTS

The information in this report that relates to Exploration Results and Exploration Targets is based on information compiled by Mr Seb Gray, a Competent Person who is a Member of Australian Institute of Geoscientists (AIG). Mr Gray is a full-time employee of Sheffield Resources Ltd and has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Gray consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

The information in this report that relates to the estimation of the Mineral Resources is based on information compiled by Mrs Christine Standing, a Competent Person who is a Member of the Australian Institute of Geoscientists (AIG) and the Australasian Institute of Mining and Metallurgy (AusIMM). Mrs Standing is a full-time employee of Optiro Pty Ltd and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which she is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mrs Standing consents to the inclusion in this report of the matters based on her information in the form and context in which it appears.

Industry data

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Estimates of resources and reserves and exploration results

This presentation contains estimates of Sheffield's Ore Reserve and Mineral Resources and information that relates to exploration results.

The Mineral Resources and Ore Reserves of Sheffield have been extracted from Sheffield's ASX releases;

- "HIGH GRADE MAIDEN MINERAL RESOURCE AT NIGHT TRAIN" 31 January 2019
- "MINERAL RESOURCE AND ORE RESERVE STATEMENT" 3 October 2018
- "THUNDERBIRD ORE RESERVE UPDATE" 16 March 2017
- "SHEFFIELD DOUBLES MEASURED MINERAL RESOURCE AT THUNDERBIRD" 5 July 2016

The exploration results have been extracted from Sheffield's ASX release's;

- "NEW LARGE HIGH GRADE DISCOVERY SOUTH OF THUNDERBIRD" 13 November 2018
- "EXCEPTIONAL RESULTS CONFIRM MAJOR DISCOVERY AT NIGHT TRAIN" 9 October 2018

A copy of these announcements is available at http://www.sheffieldresources.com.au/irm/content/asx-announcements1.aspx?RID=398 or www.asx.com.au.

The Company confirms that it is not aware of new information or data that materially affects the information in these announcements and, in the case of estimates of mineral resources and ore reserves, that all material assumptions and technical parameters underpinning those estimates continue to apply and have not materially changed.

Bankable Feasibility Study ("BFS")

This presentation contains information that relates to a Bankable Feasibility Study. This information was extracted from the following ASX releases by Sheffield:

- THUNDERBIRD BFS DELIVERS OUTSTANDING RESULTS" 24 March, 2017

Other Extracted Information

This presentation contains information extracted from the following ASX releases:

"QUARTERLY ACTIVITIES REPORT" 30 January 2019
"QUARTERLY CASHFLOW REPORT" 30 January 2019
"SHEFFIELD SECURES THUNDERBIRD LNG SUPPLY AGREEMENT" 22 January 2019
"SHEFFIELD SIGNS TAURUS DEBT FACILITY AND EPC CONTRACT" 12 November 2018
"NATIVE TITLE AGREEMENT SIGNED BY TRADITIONAL OWNERS" 1 November 2018
"FEDERAL ENVIRONMENTAL APPROVAL GRANTED FOR THUNDERBIRD" 28 September 2018
"MINING LEASE GRANTED OVER THUNDERBIRD MINERAL SANDS PROJECT" 26 September 2018
"NAIF APPROVES LOAN FACILITIES TOTALLING A$95M" 19 September 2018
"NATIVE TITLE UPDATE: SHEFFIELD SIGNS CO-EXISTENCE AGREEMENT" 10 September 2018
"FAVOURABLE NATIONAL NATIVE TITLE TRIBUNAL OUTCOME" 28 August 2018
"STATE MINISTER FOR ENVIRONMENT APPROVES THUNDERBIRD MINERAL SANDS PROJECT" 13 August 2018
"GRANT OF MISCELLANEOUS LICENCES" 27 June 2018
"MAIDEN BINDING ILMENITE OFFTAKE AGREEMENT" 21 June 2018
"ADDITIONAL BINDING OFFTAKE SIGNED" 1 February 2018
"BINDING OFFTAKE AGREEMENTS EXCEED 50% OF STG 1 REVENUE" 22 December 2017
"BINDING ZIRCON CONCENTRATE OFFTAKE AGREEMENT SIGNED" 12 December 2017
"COMMENCEMENT OF EARLY WORKS AND TRAINING PROGRAM" 4 December 2017
"SHEFFIELD ANNOUNCES EPC PREFERRED CONTRACTOR" 19 October 2017
"SHEFFIELD MANDATES TAURUS FOR US$200M DEBT FACILITY' 18 October 2017
"EPA RECOMMENDS APPROVAL OF THUNDERBIRD" 9 October 2017
"SHEFFIELD SECURES SECOND BINDING OFFTAKE AGREEMENT" 25 September 2017
"SHEFFIELD SIGNS MAIDEN BINDING OFFTAKE AGREEMENT" 12 September 2017
"SHEFFIELD LAUNCHES ABORIGINAL EMPLOYMENT PROGRAM" 17 August 2017
"THUNDERBIRD ILMENITE EXCEEDS PREMIUM SPECIFICATION" 13 March 2017
"OUTSTANDING IMPROVEMENTS IN RECOVERIES AND PRODUCT SPECIFICATIONS FROM THUNDERBIRD BFS" 12 October 2016

Compliance and disclaimer

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This presentation contains certain "forward-looking statements". Forward-looking statements can generally be identified by the use of forward looking words such as "forecast", "likely", "believe", "future", "project", "opinion", "guidance", "should", "could", "target", "propose", "to be", "foresee", "aim", "may", "will", "expect", "intend", "plan", "estimate", "anticipate", "continue", "indicative" and "guidance", and other similar words and expressions, which may include, without limitation, statements regarding plans, strategies and objectives of management, anticipated production dates, expected costs or production outputs for the Company, based on (among other things) its estimates of future production of the Thunderbird Project and the future operation of Sheffield and the Thunderbird Project.

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Investment highlights

Low risk & simple operation	• Located in a **low risk, mining focused jurisdiction** with certain key infrastructure already in place (roads, port, etc.) • Conventional heavy mineral sands processing circuit and dozer trap mining underpinning a simple operation with full Mineral Separation Plant designed to produce premium finished products suitable for global markets • **Thick, continuous high grade zone** and deposit geometry favours low cost large scale dry mining • De-risked development with a fixed price, **lump-sum EPC contract** covering c. 80% of estimated development capex for Stage 1
BFS update targets	• Study is well advanced on **lower upfront capital, increased zircon production** and **deferring construction of the LTR circuit to Stage 2** • Strengthening Sheffield's position as a **globally significant future zircon producer** • Expected to be finalised in Q3 2019
Potential for material exploration upside	• Strategic value of Sheffield's Dampier Project (which includes Thunderbird) tenements demonstrated with multiple discoveries made along a **160km long trend** – potential for significant exploration success • **Night Train already confirmed as a major new mineral sands deposit** with multiple high grade intersections – 130Mt inferred resources (1.2% HM cut off grade) @ 0.5% zircon, 1.7% HiTi leucoxene and rutile and 0.7% ilmenite • Three substantial new mineral sands discoveries also outlined at Buckfast, Bohemia and Concorde • Exploration potential is all upside, with none of this factored into the BFS, NPV or IRR
Favourable market dynamics	• Thunderbird's expected first production in late 2020 or early 2021 to coincide with an **expected global zircon and titanium feedstock supply shortage** • **Current TZMI long term zircon and titanium feedstock pricing is favourable compared to the average pricing applied in the March 2017 Thunderbird BFS** (US$1,435/t[2] vs. US$1,381/t for premium zircon and US$208/t [2]vs. US$183/t for LTR ilmenite, based on current TZMI long term pricing). Current spot zircon price is c. US$1580 - 1640[1] • LTR ilmenite (53-57% TiO_2) product is ideally suited as a direct input to both sulphate pigment production and the growing chloride slag markets • 77% of Stage 1 revenue committed in binding offtake agreements (minimum 2 year tenor, and a 5 year tenor for more than 90% of current contracts) demonstrating strong demand for Thunderbird's products

1. Source: Iluka reference price H1 2019 and Ferro Alloy Net Reports
2. March 2018 TZMI Market Study Report

Fully permitted and construction ready

Management has achieved all key milestones prior to equity funding

Fully permitted and construction ready

- **Mining Lease granted, water permits and Federal and State environmental approvals in place**
- **Native Title Agreement signed**
- **Equity funding is the last key milestone required before construction**
- Construction ready with first production expected in Q4 2020 to Q1 2021

Binding offtake secured for 77% of Stage 1 revenue

- **Binding, take-or-pay offtake agreements** secured for 100% of Stage 1 zircon products and 50% of Stage 1 LTR ilmenite with a wide selection of offtake parties
- Offtake secured through binding, take-or-pay contracts with a minimum 2 year tenor, and a 5 year tenor for more than 90% of current contracts
- **Strong interest for remaining Stage 1 ilmenite (c. 150kt) and Stage 2 products**

Debt financing 100% secured[1]

- **US$175m debt facility provided by Taurus**
- Northern Australia Infrastructure Fund (“**NAIF**”) Board (Australian Federal Government) has made an investment decision to provide long term debt facilities totalling **A$95m**[2] (expected to enter into definitive documentation by Q2 2019)

EPC contract in place for ore processing plant significantly de-risks project execution

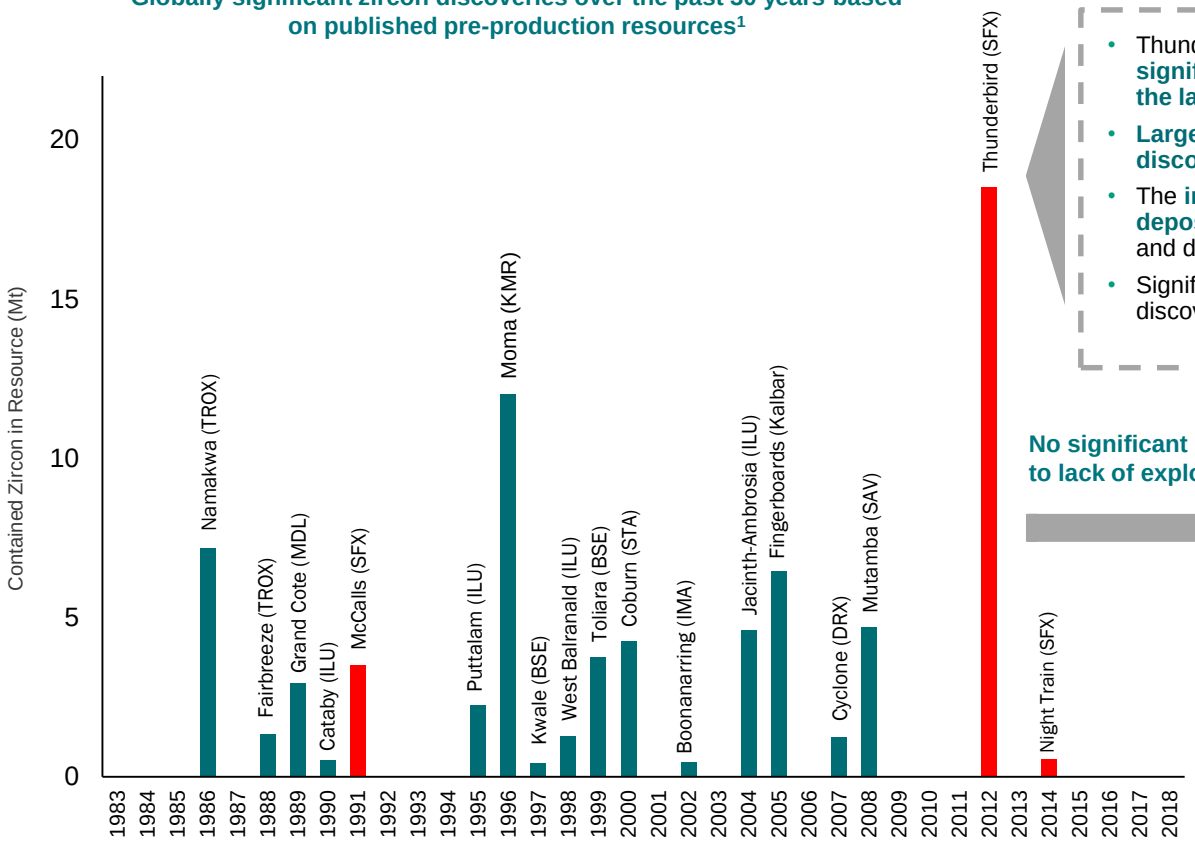
- Engineering, Procurement and Construction (“EPC”) contract in place with GR Engineering Services Limited (“GRES”) to deliver the process plant and associated infrastructure on a **turnkey basis**
- **De-risked project delivery** with lump sum, fixed price contract (A$366m) which covers approximately 80% of estimated Stage 1 total development capital costs
- GRES to assume substantial performance and metallurgical guarantees
- **Construction ready with completion of 100% of process design, site and plant layouts, general arrangements**, earthworks and structural design (includes mechanical and electrical equipment specifications, vendor pricing confirmation, procurement plan and detailed project execution plans)
- Peer review of all design and engineering completed to date
- Next steps involve site mobilisation and procurement

1. Refer to ASX Announcement SHEFFIELD SIGNS TAURUS DEBT FACILITY AND EPC CONTRACT” 12 November 2018
2. Tenor and other terms for the NAIF facilities are non-binding and subject to definitive documentation being entered into

A globally significant zircon discovery

Only opportunity to secure a large scale greenfield zircon project, with no other significant discoveries remaining

Globally significant zircon discoveries over the past 30 years based on published pre-production resources[1]



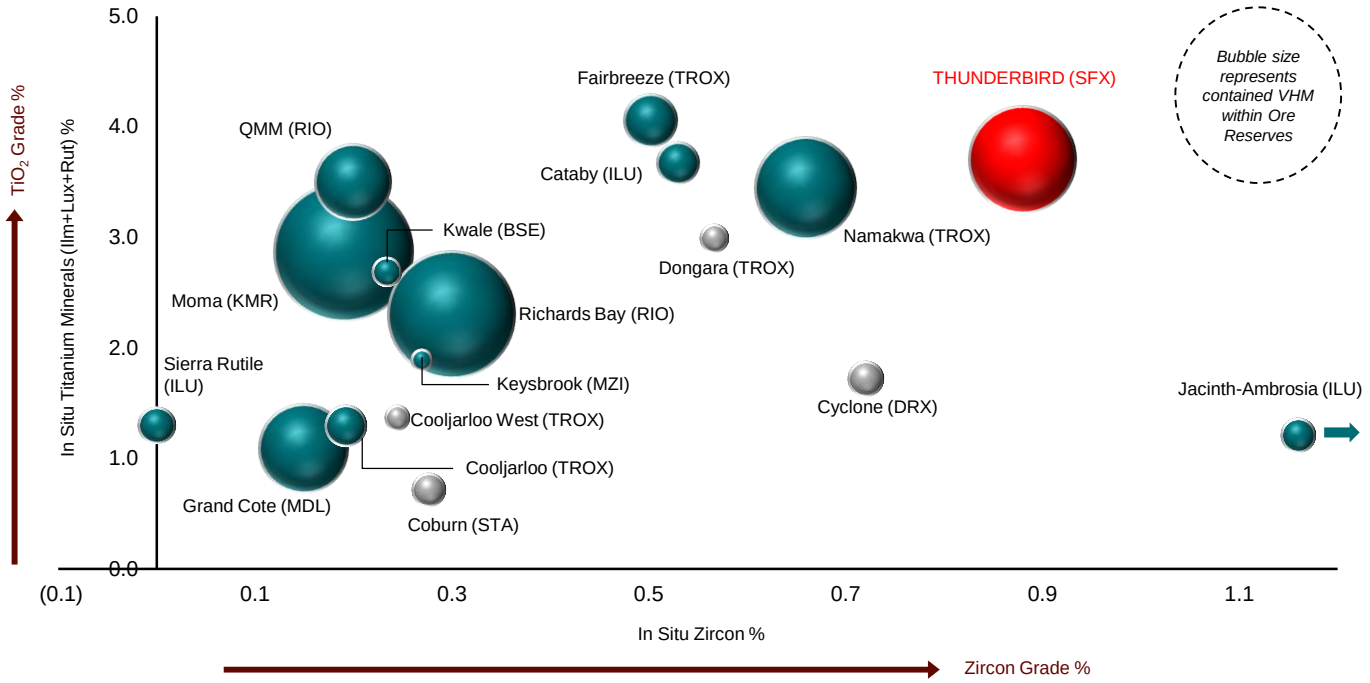
- Thunderbird is one of the most **significant zircon discoveries in the last 30 years**
- **Large zircon rich deposits are not discovered often**
- The **industry needs significant new deposits** to replace maturing supply and declining grades
- Significant timelines between discovery and development

No significant new discoveries due to lack of exploration investment

1 Thunderbird Mineral Resource as published on the ASX on 5 July 2016. Thunderbird Mineral Resource ranked against published pre-production Mineral Resources of current mineral sands operations and projects > 2M tonnes contained zircon plus selected deposits < 2Mt contained zircon under investigation globally. Data compiled by Sheffield from public sources

Largest, high grade, zircon rich mineral sands projects globally

Comparison of Ore Reserves and grade between the key global mineral sands deposits[1,2,3]



Notes:
1. Thunderbird Ore Reserve as published on the ASX on 3 October 2018. Thunderbird Ore Reserves ranked against latest published Ore Reserves of current mineral sands operations and projects under investigation globally. Accordingly, for the operating projects, no account is made for any volumes of product already produced
2. Green bubbles are operating mines, grey bubbles are Ore Reserves reported but the project is not operating. Only Ore Reserves > 1.2Mt contained VHM shown
3. Data compiled by Sheffield from public sources. This analysis does not illustrate the variance in product value between rutile, leucoxene and ilmenite

8 years of Thunderbird history

A greenfield project rapidly progressed by Sheffield from the grassroots exploration stage which has achieved all key milestones

Milestones pre BFS release

Dec 2010: EL application

Applied for Exploration Licence E04/2083, the eventual Thunderbird deposit

Sep 2011: Tenement Grant

Granted the tenement for the area surrounding and including Thunderbird

2012: Maiden Resource

Commenced first drilling program and released maiden Mineral Resource for Thunderbird

2013: Industry recognition

Awarded the "Digger and Dealers Mining Forum Best Emerging Company Award" and the "Australian Mining Prospect Awards Explorer of the Year"

2014: Resource expansion, Scoping Study

Significant increase in total Mineral Resources and released scoping study results

Mar 2015: Coordinated project

Thunderbird designated a Level 2 Lead Agency Project Proposal by the Western Australia Department of Mines and Petroleum

Oct 2015: Increase in scale

Released an update to the PFS modelling indicating a substantial increase to scale

Mar 2017: Thunderbird Ore Reserve Update

Ore Reserve of 680.5Mt at 11.3% HM

Mar 2017: BFS release

Released BFS study

Milestones post BFS release

Oct 2017: Taurus debt

Mandated Taurus as lead arrangers and underwriters for a US$175m debt finance facility

May 2018: Port

Signed 20 year Derby Port Access Agreement for long term access to an existing bulk handling facility and associated infrastructure

Sep 2018: NAIF debt

NAIF approves loan facilities totalling A$95m

Sep 2018: Permits

Mining Lease, State and Federal environmental approvals granted, finalising key permits for development

Nov 2018: Native Title

Native Title Agreement signed with Traditional Owners

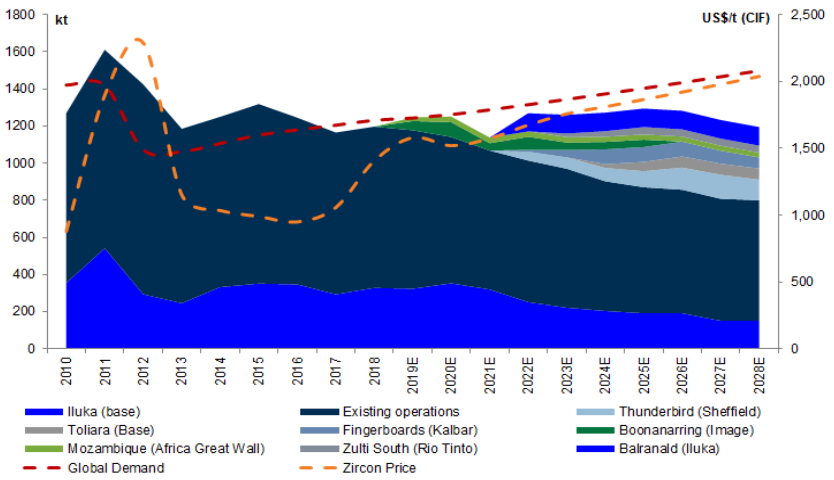
Nov 2018: EPC contract

Signed fixed price, lump sum, EPC contract with GR Engineering Services

Consensus supports substantial zircon structural supply issues

Thunderbird ideally positioned to help bridge the expected supply gap

Significant zircon supply gap expected[1]



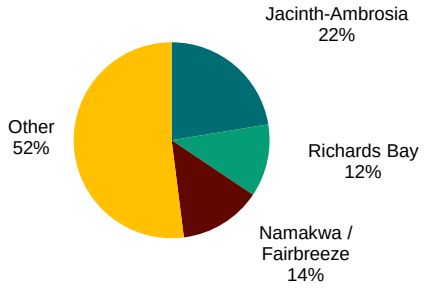
Key observations

- Supply **decline of 4.3%** p.a. expected up to 2025
  - Supply is **dominated by Australia and Sub-Saharan Africa** – material supply deficit emerges from 2019, due to reserve depletion, jurisdictional risks and limited exploration success
  - In particular, **Ore Reserves expected to diminish** at the mature, larger scale assets such as **Jacinth-Ambrosia and Richards Bay**
  - **Zircon supply deficit to increase from 2022** as demand outpaces supply growth (even with the onset of new projects)
  - **Mine closures** at North Stradbroke Island (Australia) in 2019 and Mataraca (Brazil) in 2019
- **Supply gap is primarily driven by an expected decline in supply, rather than a forecast increase in demand**
- **Thrifting and substitution** have reached logical limits
- Reserve depletion of existing projects and **jurisdictional risks** associated with new projects are expected to tighten supply, **supporting zircon's robust price outlook**

Zircon supply at risk with c. 50% of global zircon production concentrated in three mature assets

- c. 50% of global zircon production sourced from 3 mature operations:
  - **Jacinth-Ambrosia** (c. 280ktpa, 10+ years old, Australia)
  - **Richards Bay** (c. 150ktpa, 40+ years old, South Africa)
  - **Namakwa / Fairbreeze** (c. 170ktpa, 30+ years old, South Africa)
- **Declining grade and ore reserves** at these 3 operations will exacerbate the supply deficit
- Additional **jurisdictional and geopolitical risk** given 2 of the assets are located in South Africa
- **Australia's overall zircon output from existing operations is expected to decline** substantially to c. 200ktpa by 2026

Split of Global Zircon Production



Notes:
1. Goldman Sachs Global Investment Research note on Iluka (ASX:ILU) dated 11 March 2019

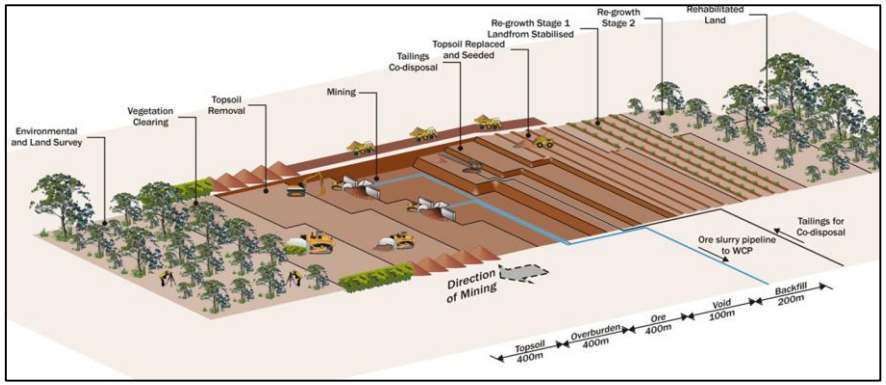
Conventional and well tested mining techniques

Thunderbird will use conventional and well tested dry mining techniques and equipment currently employed in existing and similar mineral sands operations globally

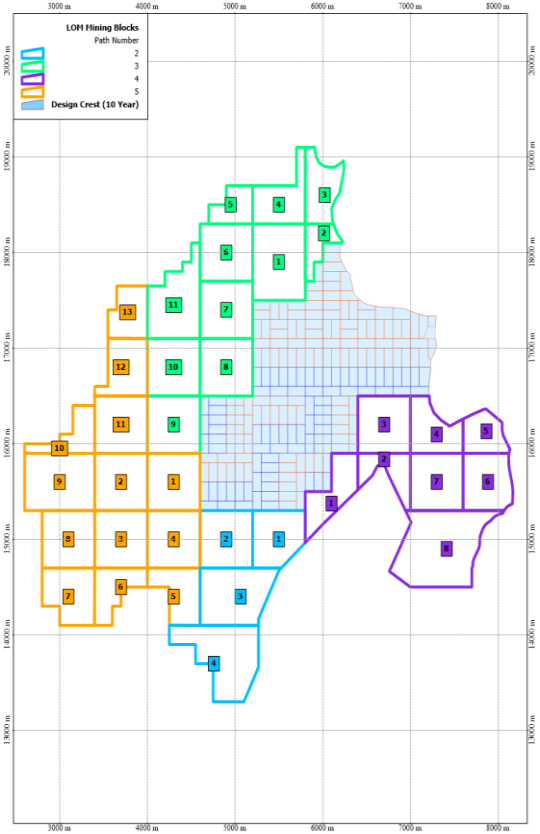
Major mining equipment to be utilised[1]

Class	Description	Max utilisation (hrs/month)	Year 1 – 4	Year 5 – 10	Year 11 - 43
70t Excavator	Hitachi ZX690LC-5	500	2	1	1
120t Excavator	Komatsu PC1250SP-8R	500	0	2	3
100t Loader	CAT 992k	500	1	2	2
100t Truck	CAT 777G	500	4	6	7
100t Bulldozer	CAT D11T CD	450	3	6	5
65t Bulldozer	CAT D10T	500	2	3	3
Grader	CAT 16M	500	2	2	3
Water Cart	CAT 745	500	1	1	2
Service Truck	CAT 745	500	1	1	1

Schematic diagram showing mining method



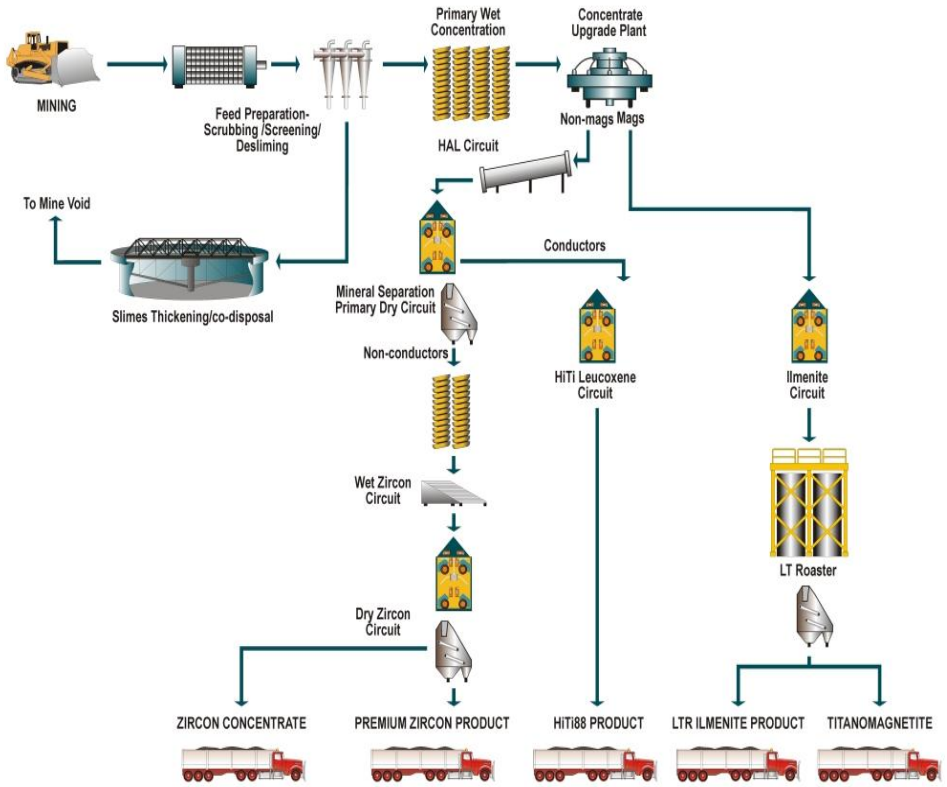
LOM mining blocks[1]



Note:
1. Sourced from the Bankable Feasibility Study

Simple and conventional processing circuit

Flowsheet producing five high grade, high quality products



Flowsheet summary

- **Conventional and simple** heavy mineral sands processing circuit designed by Hatch and Robbins Engineering[1]
- Flowsheet produces **premium zircon and zircon concentrate**
- **Ilmenite upgrade via low temperature roast ("LTR")** at c. 500° C
- LTR upgrades **ilmenite to > 56% TiO_2** which can be used to produce premium sulphate ilmenite, and chloride slag feed
- LTR ilmenite is **low in chrome and alkalis** with market-leading acid solubility
- The **flowsheet** has been **constant and stable since the 2015 PFS**
- Scoping **Rare Earth** potential of Thunderbird

Recoveries[2]	BFS test work
LTR Ilmenite	71.0%
Zircon Premium (66% ZrO_2)	56.1%
Zircon Concentrate (44% ZrO_2)	33.0%
Hi-Ti88 Leucoxene	35.3%

Notes:
1. Based on metallurgical testwork carried out on a 40t bulk sample using full scale & scalable equipment
2. Sourced from the ASX announcement released on 12 October 2016

Low temperature roast ("LTR") of primary ilmenite

LTR enables the upgrade of Thunderbird's primary ilmenite to >56% TiO_2 which makes it suitable for chloride slag and sulfate pigment processes

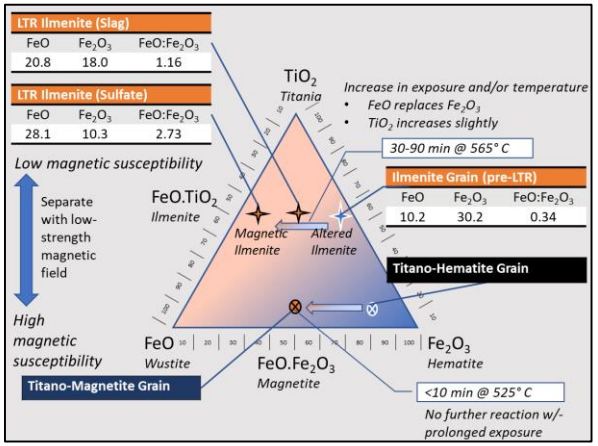
Overview of LTR

- Thunderbird's primary ilmenite product contains TiO_2 with grades of between 38% - 48% and contains iron oxides in the form of free hematite and other iron oxides, with very low levels of other contaminants and trace elements
- The free iron gangue particles have similar density, particle size and magnetic susceptibility to the ilmenite particles, and in their primary state, are difficult to separate
- The LTR process (reduction roast) operates at c. 500º C and enhances the magnetic susceptibility of iron oxides to enable their subsequent magnetic separation from the ilmenite grains
- This process also adjusts the $FeO:Fe_2O_3$ ratio within the ilmenite grains, making Thunderbird LTR ilmenite a premium product and suitable for use as feed for chloride slag and sulfate pigment production
- The conversion of the iron oxides is achieved by exposing the primary ilmenite product to reducing gases, contained in a "syngas" – the syngas is produced in a fluid bed roaster by the partial combustion of liquid natural gas

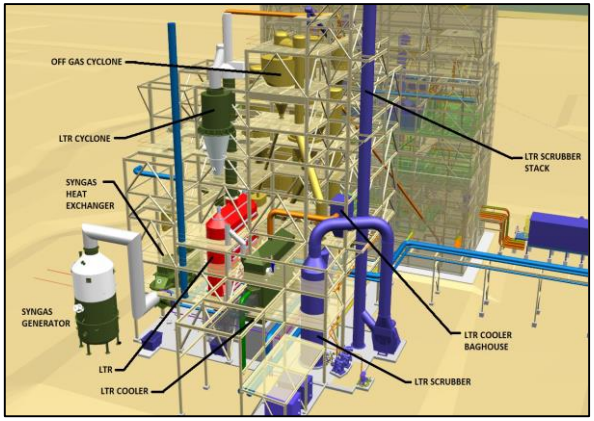
A well understood process

- Roasting of ilmenite products in either oxidizing or reduction atmospheres has been used since the 1950s to selectively enhance the magnetic susceptibility of ilmenite ores[1]
- LTR metallurgical test work has been completed via batch and continuous processes with the subsequent separation of the LTR ilmenite product completed by the same group in all cases. In excess of 50 batch tests and 7 continuous tests programs have been completed
- LTR metallurgical test work and process design[2] has been reviewed by independent technical experts during the debt funding process with the EPC contractor GR Engineering Services reviewing feed design and conducting early engineering
- The LTR roaster is a fluidized bed reactor. Fluidized-bed technology dates to the early 1930s and 1940s with the development and use of the technology in coal gasification and metal refining applications in Germany and by the petroleum industry to speed the reaction of oil feedstock catalytic cracking in the 1930s. Fluid bed technology has since been established as the primary technology for such applications[3]

Effect of reduction roast on contained ilmenite and hematite



Engineering Design of LTR process



Notes:
1. Literature search shows references to alteration of ilmenites via roasting back until the 1950s. For instance, Bozarth RM et aJ. 1957, "Magnetisation of Ilmenite-Hematite system at low temperatures". Letter to the editor of Physical review, volume 108 number I, October I, 1957. Referenced in Joalet Dalene Steenkamp, "Beneficiation of an ilmenite waste
2. Process design by Hatch and Robbins Engineering, based on metallurgical testwork carried out on a 40t bulk sample using full scale & scalable equipment
3. The Fluid Bed Reactor, American Chemical Society, 1998. This booklet commemorates the designation of The Fluid Reactor as a National Historic Chemical Landmark

BFS update targets reduced capital and improved economics

BFS update targets deferral of the LTR Ilmenite circuit, capital reduction and increased zircon production

De-risking of 2017 BFS

- Since completion of the BFS in March 2017, multiple de-risking milestones have been achieved including:
  - Fixed price **EPC** contract executed with GR Engineering Services (GRES) and reviewed by debt providers and independent technical experts
  - Taurus and NAIF **debt facilities agreed**
  - **Opex reductions** from NAIF funding of infrastructure
  - **Firm supply contracts and pricing**
    - gas supply agreement,
    - mining services contract,
    - village services contract
  - **Binding offtake agreements** for 100% of zircon and 50% of LTR ilmenite
- Global consensus view on **zircon structural supply deficit** for the foreseeable future

2019 BFS update targets

- Consolidation of all de-risking milestones into a BFS update
- Deferral of the LTR Ilmenite Circuit (LTR)
- Increased Zircon Revenue
- Financial improvements
- Supported by Independent Consultants
- Expected to be finalised in Q3 2019

Target deferral of the LTR

- Current BFS envisages Stage 1 construction of the LTR
- Over the past 6 months, Sheffield has been investigating the impact of deferring the construction of the LTR to Stage 2
- Ilmenite circuit to be truncated after Concentrate Upgrade Plant (CUP) allowing sale/stockpiling of ilmenite concentrate

Target increased Zircon revenue

- Replace LTR revenue with zircon revenue via increase to zircon throughput
- Flowsheet is a **subset** of the agreed due diligence and EPC contract assessment

Target financial improvements

- Reduction in upfront capex
- Maintain debt capacity
- Reduction in equity funding requirement
- Reduced construction timeline and working capital requirements
- Higher premium zircon and zircon concentrate volumes
- Improved economics

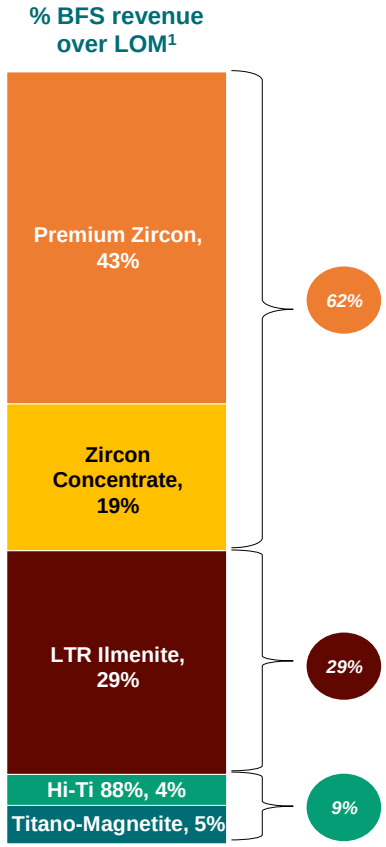
Study supported by Independent Consultants

- Independent Consultants engaged with prior knowledge of the Thunderbird Project and the mineral sands industry
- BFS update expected to deliver updated Ore Reserve
- Discussions on off-take for additional production are well advanced

Premium quality products

Production of high quality zircon and ilmenite products

- **Thunderbird produces high quality finished products** comprising:
  - Premium zircon, zircon concentrate, LTR ilmenite, Hi-Ti 88 and titano–magnetite
- The **premium zircon** product has high ZrO_2 (> 66% ZrO_2 + HfO_2) and very low contaminant trace elements (low in TiO_2, Fe_2O_3, Al_2O_3), making it suitable for a wide range of applications
  - **Suited to ceramics, zirconium chemicals industry, foundry, investment castings and other specialty markets**
- **Zircon concentrate** provides options in terms of both product and specifications
  - Current preferred approach is to offer a ZrO_2 rich (c. 44% ZrO_2) concentrate to customers for further process upgrading
  - Suited to ceramics (as a blended product), zirconium chemicals industry, foundry and investment castings
- **LTR ilmenite (57.0% TiO_2)** is a premium ilmenite suited as:
  - Feedstock for **sulphate TiO_2 pigment production**
  - Feedstock for **chloride grade titanium slag** and high-purity pig iron production targeted for chloride TiO_2 pigment production
  - A potential blended direct feedstock for chloride TiO_2 pigment production
  - A premium product given its qualities will attract premium pricing in Asia
    - **High TiO_2 grade**
    - **High reactivity (Fe_2O_3 < 13%)**
    - **Low contaminants Cr_20_3, MgO and CaO**
- **Hi-Ti 88 is suitable for a variety of applications** including welding electrode applications, production of titanium sponge, and as potential blended feedstock for the chloride TiO_2 pigment process
- **Titano-magnetite** contains >56% Fe and 10% TiO_2, is low in impurities and is a co-product of the LTR process. Preliminary assessment indicates that Titano-magnetite can be used to protect steel blast furnace hearths against erosion



Note:
1. Sourced from BFS March 2017

77% of Stage 1 revenue secured under binding offtake agreements

Robust demand for Thunderbird offtake with Stage 2 offtake 100% available

- Robust demand for Thunderbird offtake underpinned by:
  - **High quality** zircon and LTR ilmenite products
  - **Long term** supply over a 42 year mine life
  - **Low risk mining** jurisdiction in close proximity to the growing Asian market (China consumes c. 50% of the world's zircon and ilmenite feedstock)
- Existing offtake agreements are binding, take-or-pay contracts with a minimum 2 year tenor (> 90% have a 5 year tenor) and are underpinned by industry standard pricing by negotiation on a quarterly or six monthly basis with fall-back mechanisms to benchmark pricing. No discounts based on quality of the products
- All offtake contracts automatically extend at the end of the initial contract period
- Stage 2 volumes currently available for all products for partner groups
- Customer groups in all regions have shown interest in the potential supply of Stage 2 offtake – Sheffield intends to secure offtake agreements for Stage 2 after 100% of Stage 1 offtake is secured
- Binding offtake coverage meets conditions precedent for debt financing under the Taurus syndicated facility agreement

Stage 1 offtake summary

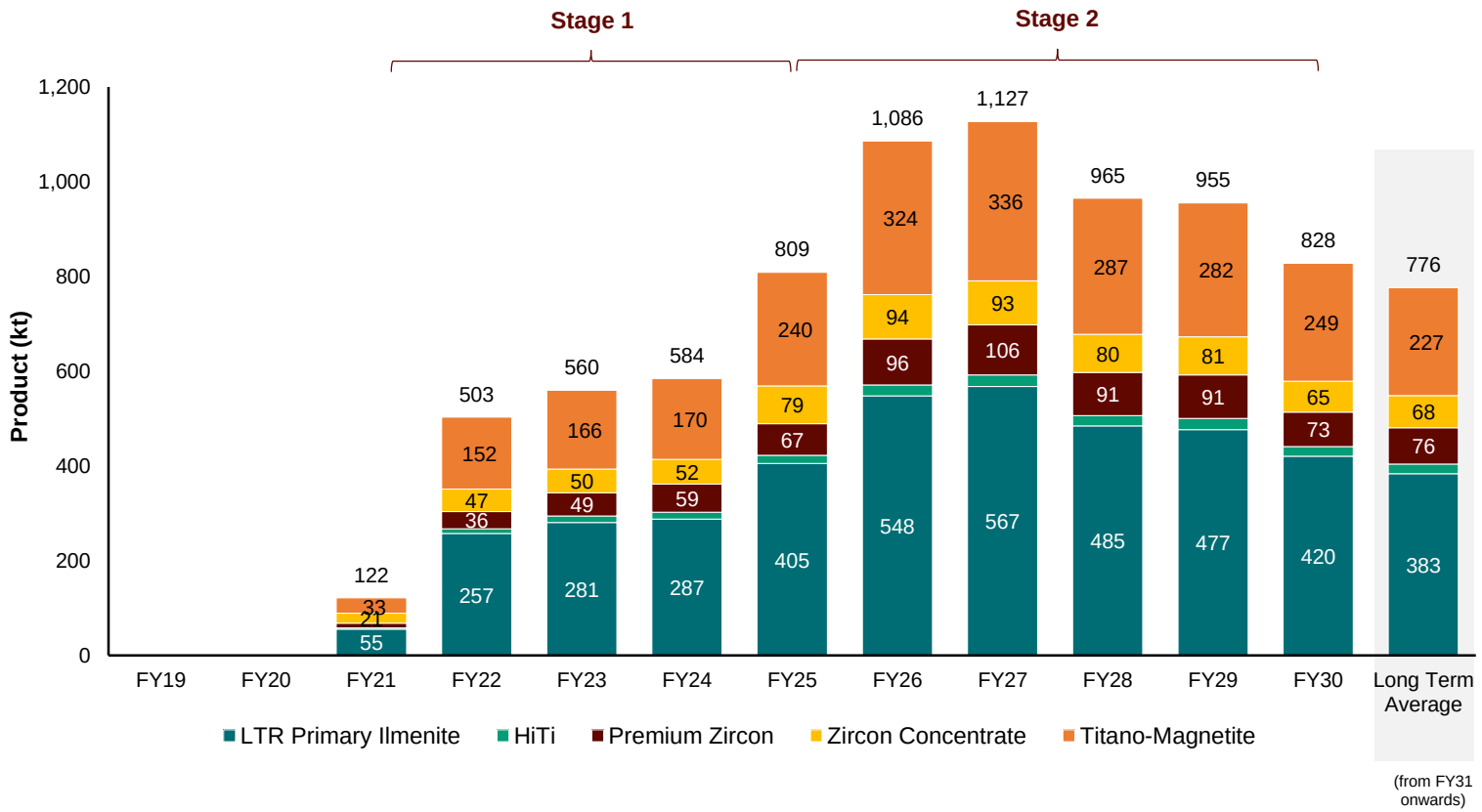
Product	% BFS Revenue	Binding Agreement (% of Stage 1)	Offtake Parties
Premium zircon	**43%**	**100%**	Sukaso, Ruby Ceramics, RZI, Qingyuan Jinsheng, Minchem, CFM, Other
Zircon concentrate	**19%**	**100%**	Hainan Wensheng, RZI
LTR ilmenite	**29%**	**50%**	Bengbu
HiTi-88	**5%**	In Progress	n/a
Titano-magnetite	**4%**	In Progress	n/a

Product has been widely tested and approved by counterparties

- Product samples supplied, assessed and **fully approved by offtake partners**
- Samples have been supplied to global consumers in Europe, China, India, South East Asia and the Americas
  - In **excess of 30 premium zircon samples supplied** to potential consumers for assessment – **material approved for use** in ceramics, Zr chemicals, fused zirconia, refractories, and foundry applications in all regions
  - **9 samples of zircon concentrate** supplied to potential consumer groups in China – **material approved by all concentrate processors**
  - **Over 20 samples of ilmenite** sent to potential consumer groups for assessment – **material approved as a direct feedstock** in the production of sulfate pigment in both Western and Chinese sulfate pigment plants and also for the production of chloride slag
- After c. 60 samples have been tested by potential consumers, 100% of Stage 1 zircon and 50% of Stage 1 ilmenite product has been fully contracted, demonstrating Sheffield's product is suitable and of high quality, especially for the Asian market

Indicative mine schedule

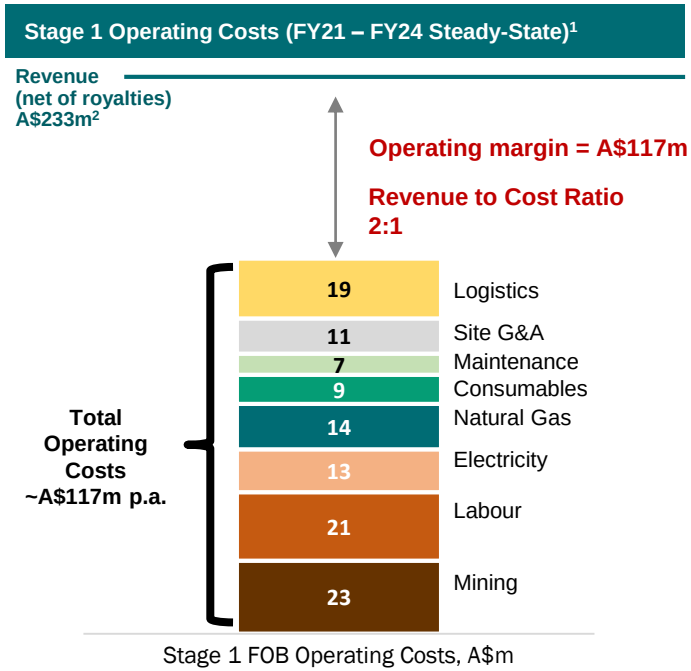
LOM plan to deliver 145ktpa zircon and 388ktpa LTR ilmenite on average over a 42 year mine life

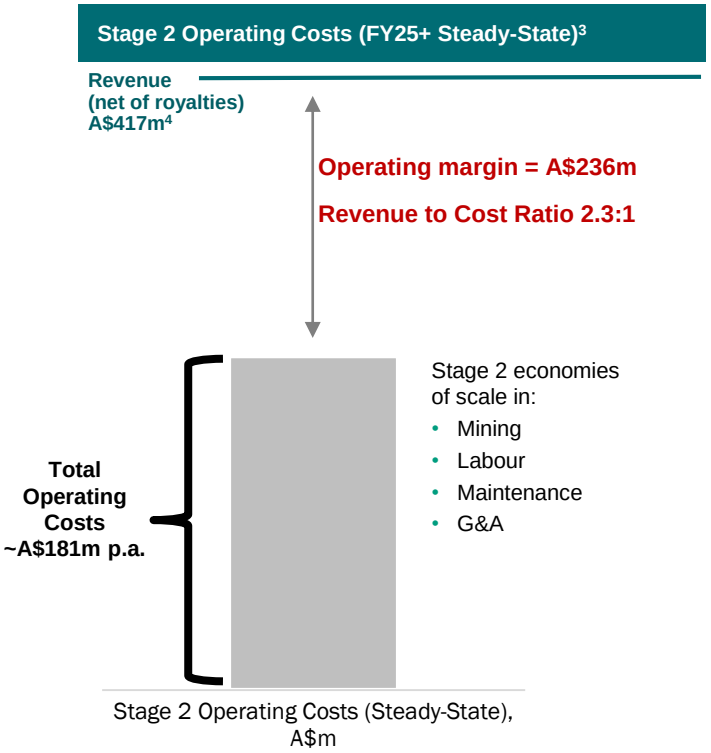


Cautionary statement: This slide sets out production profile information for Stage 1 and Stage 2 of the Thunderbird Project. Such information is derived from the financial model prepared by Sheffield for Stage 1 and Stage 2 of the Thunderbird Project. The financial model for Stage 1 has been provided to Taurus, NAIF and their respective advisers, to underpin the provision of debt finance by Taurus and NAIF for construction of Stage 1. These parties have undertaken detailed due diligence on the input assumptions to, and outputs from, this model. The financial model for Stage 2 is based on current Sheffield management estimates, which will be confirmed prior to a Stage 2 investment decision and its implementation. Such estimates are based on, among other things, a detailed mine plan prepared as part of the BFS for the life of mine (including Stage 2) and other BFS assumptions for Stage 2, which, where relevant, have been adjusted to reflect contractual outcomes and the results of due diligence on Stage 1. Accordingly, the production profile is not and should not be interpreted as a production target or any other projection of likely future outcomes. Actual volumes produced will be subject to a number of risks and uncertainties and therefore may vary materially from this current, indicative profile. Sheffield does not currently have sufficient certainty (and therefore does not have a reasonable basis) from which to issue any production targets in respect of the Thunderbird Project.

Projected operating costs

Leading Revenue to Cost Ratio





Cautionary Statement: This slide sets out revenue and operating cost information for Stage 1 and Stage 2 of the Thunderbird Project. Such information is derived from the financial model prepared by Sheffield for Stage 1 and Stage 2 of the Thunderbird Project. The financial model for Stage 1 has been provided to Taurus, NAIF and their respective advisers, to underpin the provision of debt finance by Taurus and NAIF for construction of Stage 1. These parties have undertaken detailed due diligence on the input assumptions to, and outputs from, this model. The financial model for Stage 2 is based on current Sheffield management estimates, which will be confirmed prior to a Stage 2 investment decision and its implementation. Such estimates are based on, among other things, a detailed mine plan prepared as part of the BFS for the life of mine (including Stage 2) and other BFS assumptions for Stage 2, which, where relevant, have been adjusted to reflect contractual outcomes and the results of due diligence on Stage 1 . Accordingly, the information set out in this slide is not and should not be interpreted as a forecast or other forward looking statement as to potential revenue or cost outcomes. Sheffield does not currently have sufficient certainty (and therefore does not have a reasonable basis) from which to issue any operating cost or revenue forecasts or other guidance as to potential future outcomes.

1. Average FY23-FY24 Stage 1 only on FOB basis
2. FOB basis: Based on average Stage 1 production FY23-FY24 of premium zircon 51ktpa, zircon concentrate 53ktpa, LTR ilmenite 287ktpa, Hi-Ti 88 14ktpa and titano-magnetite 170ktpa, and TZMI's long-term price estimates of premium zircon US$1,435/t, zircon concentrate US$726/t, LTR ilmenite US$208/t, Hi-Ti 88 US$510/t and titano-magnetite US$48/t
3. Average FY26-FY29 assuming Stage 2 expansion occurs on FOB basis
4. FOB basis: Based on average Stage 2 production FY26-FY29 of premium zircon 96ktpa, zircon concentrate 87ktpa, LTR ilmenite 519ktpa, Hi-Ti 88 23ktpa and titano-magnetite 307ktpa, and TZMI's long-term price estimates of premium zircon US$1,435/t, zircon concentrate US$726/t, LTR ilmenite US$208/t, Hi-Ti 88 US$510/t and titano-magnetite US$48/t

Stage 1 execution strategy

GRES will deliver the process plant and associated infrastructure on a fixed price, turnkey basis

1 Owners Works (A$97m)

- Sheffield to manage various contracts via a combination of **EPC, fixed price or unit price works** to deliver non process plant project infrastructure and associated works
  - **Approximately 50% of Owners Works capital will be managed by EPC**
  - Mine access road – construction commenced
  - Village – purchased and installation commenced
  - Power, gas, mining & village services contracts
  - Mine plan updated
  - Customer off-take
  - Other (Derby storage shed, bore field, trial mining pits, communications, etc.)
- Sheffield to also optimise and manage key processing related activities including:
  - Process optimisation and documentation
  - Layout optimisation & general arrangements
  - Equipment specification and vendor selection
  - Peer review

2 EPC Design and Engineering

3 Construction (A$366m)

- To be undertaken by GR Engineering Services (“GRES”) on behalf of Sheffield to deliver a process plant and associated infrastructure on a fixed price, **turnkey basis**
  - Fixed price lump sum EPC contract executed with GRES, an ASX listed specialist contractor
  - GRES has extensive experience in successfully delivering mineral sands projects and has relevant Australian and global industry experience
  - EPC contract and contractor selection has been subject to due diligence by lenders and their advisers
  - EPC contract covers approximately 80% of Stage 1 upfront capital expenditure, with significant performance responsibility assumed by GRES, including:
    - **Individual 72 hour throughput tests for sections of the plant - WCP, CUP, Mags and LTR**
    - **Full plant 7 day throughput test**
    - **Metallurgical test for zircon recovery**
    - **Metallurgical test for ilmenite recovery**
    - **Metallurgical and technical support for performance testing and ramp up for 6 months after practical completion**

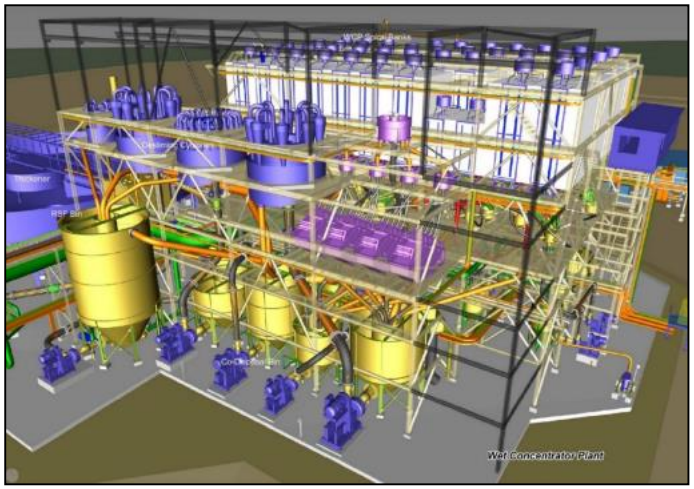
Summary of GRES EPC contract (A$366m)

GRES will deliver the process plant and associated infrastructure on a fixed price, turnkey basis. All completion risk sits with GRES, including detailed quality assurances

EPC Contract Overview

- On 12 November 2018, Sheffield announced the signing of a **A$366m fixed price, lump sum** engineering, procurement and construction ("EPC") contract with GR Engineering Services ("GRES")
- GRES is ASX listed, and is one of Australia's leading process engineering companies
  - Has extensive experience in Western Australia and in delivering mineral sands projects
- GRES will design and construct a 7.5Mtpa Stage 1 mineral processing plant and supporting infrastructure, **de-risking c. 80%** of Thunderbird's Stage 1 upfront capital cost of A$463m
- **All completion risk for the EPC contract sits with GRES**, with:
  - Seasonal events already built into the cost of the EPC contract
  - **Quality assurances through detailed performance, throughput and metallurgical guarantees**
  - Ongoing metallurgical and operational support for 6 months post practical completion
- Engineering and design activities undertaken by GRES throughout 2018 has enabled Sheffield to assess several design developments focussed on increasing throughput, operational efficiencies and the functionality of the processing plant
  - Substantially de-risks metallurgical performance and overall project execution
- **100% of process design, site and plant layouts, general arrangements, earthworks and structural design is complete.** This includes mechanical and electrical equipment specifications, vendor pricing confirmation, procurement plan and detailed project execution plans
- **GRES is ready for mobilisation**, which is anticipated to commence upon completion of equity funding.

Wet Concentrator Design and Layout



EPC Contract Scope

- The EPC contract includes :
  - Plant area civils and process water
  - Wet concentrator plant and concentrate upgrade plant
  - Zircon and ilmenite processing plant
  - Low temperature roast plant (ilmenite upgrade)
  - Hot acid leach
  - Site administration complex, stores and process workshops
  - Bore field headworks and high voltage (HV) distribution
  - Internal roads and other infrastructure to support the processing operations
  - Operational and metallurgical support during the first six months of ramp-up

Summary of Owners Works Strategy (A$97m)

Outside of the EPC contract with GRES, the remaining A$97m of Stage 1 capex will be delivered by Sheffield in the form of further EPC contracts or managed directly by Sheffield

Further EPC Tenders	Specification	Cost Estimate (A$m)	Basis of Estimate
Power station	18MW	25	EPC Bid
LNG facility	350 kL (175t)	13	EPC Bid
Derby Shed	50,000t	7	Tender
Total		**45**	

- Almost 50% of owners works costs relate to well defined, direct cost scope items with cost estimates (see table on the left) based on tenders or fixed price style contracts
- The BFS BOO assumptions identified direct ownership operating cost reductions for major non-processing infrastructure. This has been supported by NAIF financing.

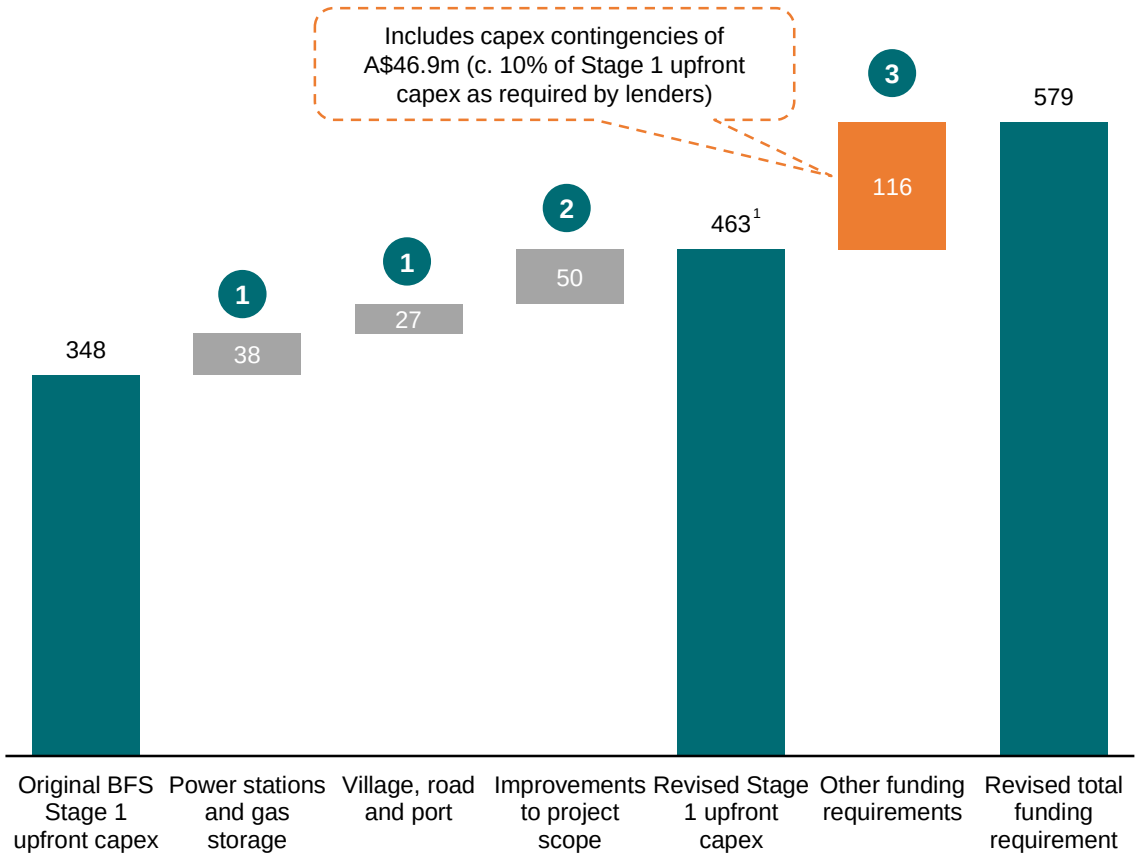
- Other direct cost items will be managed and delivered by Sheffield, further providing an opportunity to engage businesses within the local Kimberley region - **significant progress made to date on many items provides confidence on final delivery**

Other Direct Cost Items	Specification	Cost Estimate (A$m)	Comment
Village	450 Rooms	10	324 rooms purchased, 52 rooms & mess build installed
Waste Water Treatment Plant	450 personnel	1	First WWTP Unit Installed and operational on agreed Fixed Price contract
Thunderbird Access Road	30 km sealed	10	18 km existing rebuilt to final profile on schedule of rates with local contractor
Communications	Data + mobile	1.5	Installed MW tower & mobile coverage, service contract (suspended)
Temporary Surface Tailings Storage Facility	Up to 3 years	3	Detailed design, ready for schedule or rates contract
Borefield	13 drill & case	1.5	Detailed design ready for fixed price contract
Mine services and trial pits	Mobilisation	6	Detailed design and Scope of Work, ready for schedule of rates contract
Village services	Const > Ops	5	Contract ready for execution on agreed man day rates
Ops readiness, project management	Labour & indirects	14	Owners Team and pre-operations preparedness
Total		**52**	

BFS (revised) stage 1 capital expenditure

c. 80% of the revised Stage 1 upfront capex is subject to a fixed price EPC contract with GRES

Bridge From BFS Stage 1 Upfront Capex to Revised Funding Requirement (A$m)



- Original BFS Stage 1 upfront capex of A$348m, with Sheffield opting to invest a further A$115m in Infrastructure and Improvement Capex to lower the operating cost base

1. c. A$65m reflects a change in strategy which will enable Sheffield to build and own key infrastructure (power generation, gas storage and accommodation), rather than having a third party build, own and operate (BOO) the infrastructure and lease it to Sheffield. This will reduce operating costs by c. A$7.5m p.a. over LOM

2. c. A$50m relates to improvements in the project scope determined by GRES, which included upgrades to throughput, utilisation and other project de-risking initiatives

- Total Infrastructure and Improvement Capex of A$115m is c. 80% funded by the A$95m NAIF loan facilities on favourable terms to the Company

3. In addition to Stage 1 upfront capex, Sheffield will require a provision of c. A$116m in other project finance related funding required to commence operations at Thunderbird

Note:
1. Refer to ASX announcement dated 19 October 2018. Excludes working capital, corporate overheads, cost overrun provisions and financing fees

Senior debt financing summary

US$175m Taurus facility

- Lender: Taurus Mining Finance Fund and Taurus Mining Finance Annex Fund
- Syndicated facility agreement executed
- Will be underwritten by Taurus, and subsequently expected to be syndicated
- Some terms are summarised below
- ***Tranche A:***
  - Borrower: Thunderbird Operations Pty Ltd ("TOPL")
  - Amount: US$75m
  - **Interest rate: USD LIBOR + 4.5% p.a.**
    - Commitment fees on undrawn amounts: 2% p.a.
  - **Tenor: 7 years**
  - Repayable between Year 3.5 and Year 7
  - Senior secured facility[1]
- ***Tranche B:***
  - Borrower: TOPL
  - Amount: US$100m
  - **Interest rate: 8.5% p.a.**
    - Commitment fees on undrawn amounts: 2% p.a.
  - **Tenor: 7 years**
  - Repayable at end of Year 7
  - Senior secured facility[1]
- Revenue royalty of 0.50% (Years 1 – 4) and 0.75% (Years 5 – 22.5)
- Conditions precedent to drawdown: customary for a facility of this nature including (but not limited to) final due diligence and agreed equity spend
- Upfront fee is customary for a facility of this nature (50% due upon signing and the balance due on satisfaction of certain conditions precedent to drawdown of the facility)

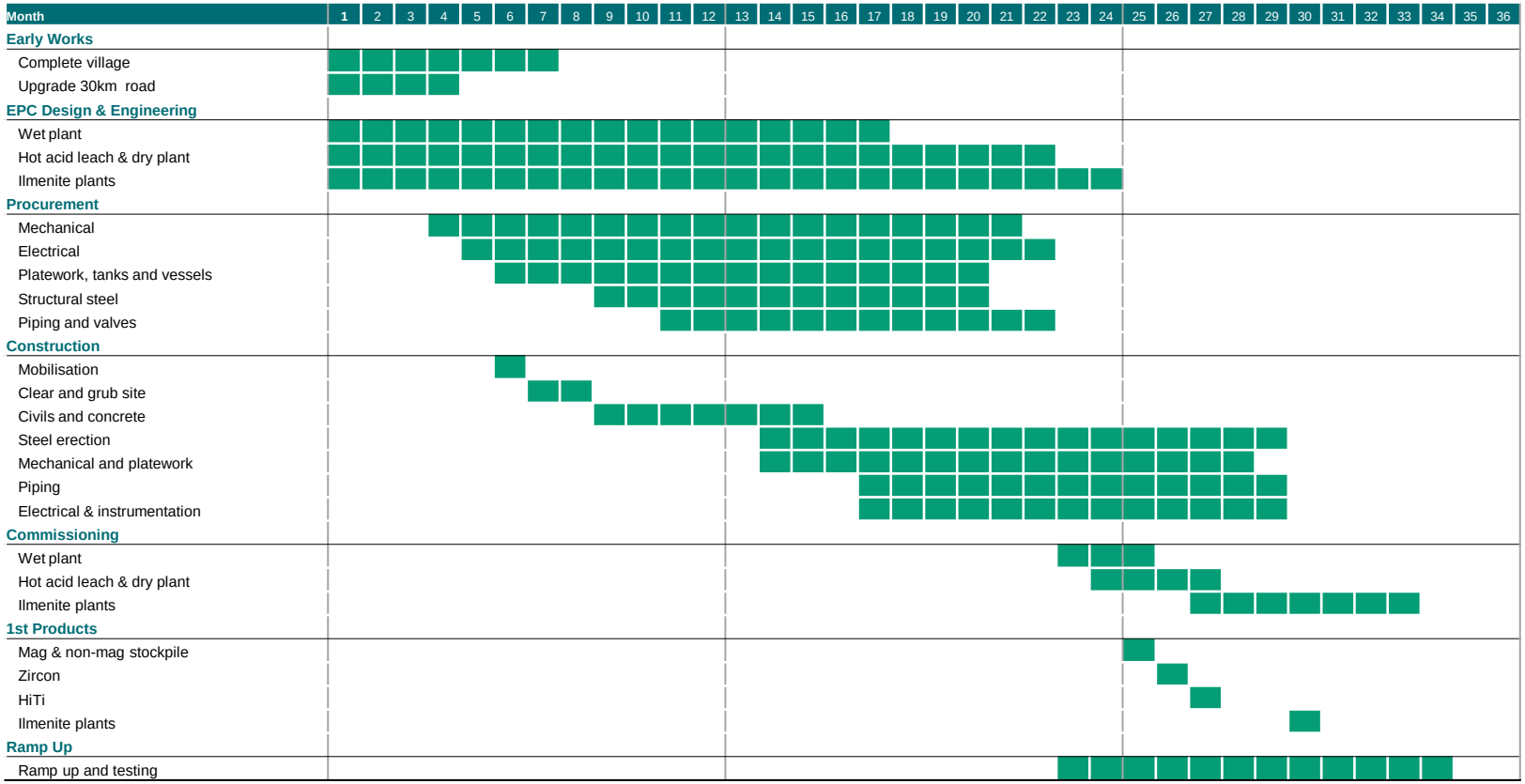
A$95m NAIF loan facilities

- Lender: State of Western Australia, under back-to-back loan from Northern Australia Infrastructure Fund ("NAIF") Board
- Non-binding Term Sheet, approved by NAIF Board. Some terms are summarised below
- ***Tranche C:***
  - Borrower: TOPL
  - A$30m Project Development Facility
  - **Tenor: 15 years** (from the signing of TOPL Syndicated Facility Agreement)
  - Straight line amortisation between Years 9 – 15
  - Senior secured[1]
  - **Interest rate: Confidential**
- ***Tranche D:***
  - Borrower: Thunderbird InfraCo Pty Ltd
  - A$65m Infrastructure Development Facility
  - **Tenor: 20 years** (from the signing of TOPL Syndicated Facility Agreement)
  - Approximate credit foncier repayment profile, payable semi-annually, from the earlier of 12 months after Whole Project Completion Date and 3.5 years from signing the TOPL Syndicated Facility Agreement
  - Senior secured[1]
  - To be used for on-site infrastructure, the upgrading of mine site roads, etc.
  - **Interest rate: Confidential**
- Conditions precedent: subject to definitive documentation being finalised and customary for a facility of this nature

1. Tranches A, B and C are senior secured over TOPL assets and rank pari passu between themselves. They have a second ranking security over InfraCo assets. Tranche D is senior secured over InfraCo assets and has second ranking over TOPL assets

Stage 1 development & commissioning timeline

The proposed timetable takes into account all foreseeable seasonal events, such as the wet season. Early works have already commenced



Source: Stage 1 development schedule based on Sheffield's current development plan as per its EPC contract with GRES

Social licence to operate (SLTO)

Sheffield has actively worked with stakeholders to create and maintain a robust SLTO

- Central to Sheffield's strategy in the Kimberley region is its social licence to operate ("SLTO")
  - **Built over eight years** and based on formal and informal community relations practices alongside constant delivery of Sheffield's promises
- Sheffield's strategy focuses on:
  - **Aboriginal engagement** and advancement
  - **Local content employment** and workforce on a **drive-in and drive-out** basis (as opposed to fly-in, fly-out)
  - Low environmental and Aboriginal Heritage impact
  - **Regional economic opportunities** and local business development
- Sheffield's community engagement practices to date are **built on strong stakeholder, social and community support for Thunderbird** and ensures a positive foundation for project development, land access, construction and project operation
- Achieved through **development and implementation of communication and consultation** strategies which ensure stakeholders to the ports, Traditional Owners, pastoralists, local shires, government authorities, local businesses and local communities are informed and engaged positively
- **Strongly supported by State and Federal Government**, Thunderbird has a 42-year mine life which will see opportunity flow within the Kimberley region for future generations

Sheffield Community Project February 2019 with the Sisters of St John of God

Environmental Advisor Gayle Williams speaks to local community members at Community Engagement workshops (Broome, September 2018)

Thunderbird Energy Needs

Thunderbird is a conventional mineral sands project built in two stages with a mine life of 42 years

Thunderbird Village communications tower

Thunderbird Energy Needs

- Conventional and simple heavy mineral sands processing circuit including:
- Mining Unit Plant (MUP)
- Wet Concentrate Plant (WCP)
- Concentrate Upgrade Plant (CUP)
- Hot Acid Leach (HAL)
- Ilmenite Processing Plant (MAG)
- Mineral Separation Plant (non-MAG)
- Thunderbird accommodation village and associated facilities
- Bore field
- Other site facilities (gas storage, power station, etc)
- Stage 1 operations calculated demand of 16MW increasing to 32MW for Stage 2 operations.

Thunderbird Power Plant – Outsource vs Insource

NAIF debt allows Sheffield to own infrastructure and reduce operating costs

Outsource

- The Thunderbird Bankable Feasibility Study ("BFS"), March 2017, contemplated the provision of on-site power generation, gas storage facilities and accommodation village to be funded by third parties on an outsourced Build-Own-Operate (BOO) basis
- This option employs higher capital costs, increasing life of mine operating costs

Insource

- The Northern Australia Infrastructure Facility (“NAIF”) Board investment decision enables Sheffield to insource and own the power generation, on commercially attractive terms
- The funding allows reduction of overall operating costs pushing Thunderbird into one of the better revenue to cost ratio projects globally

Fuel Supply Solution

Long term LNG Supply Agreement underpins Thunderbird energy needs

- Sheffield has secured a 15-year agreement with Woodside Energy Limited (Woodside) and Energy Developments Pty Ltd (EDL) for the supply and delivery of liquified natural gas (LNG) to the Thunderbird.
- LNG will be trucked approximately 900 kms from Dampier to Thunderbird
- The supply contract creates synergies with other LNG supply to towns and communities in the Kimberley

- LNG will be supplied from Woodside's Pluto LNG Truck Loading Facility in Karratha and transported to Thunderbird's LNG storage facility by a newly formed joint venture between Woodside and EDL.
- The joint venture will own and operate a purpose-built road tanker fleet to deliver the LNG to Thunderbird
- The use of LNG for Thunderbird's energy needs is a low emission alternative that reduces the carbon footprint when compared to other sources of fuel supply

Creating value from regional supply sources

Focus on region supply, local people and local businesses

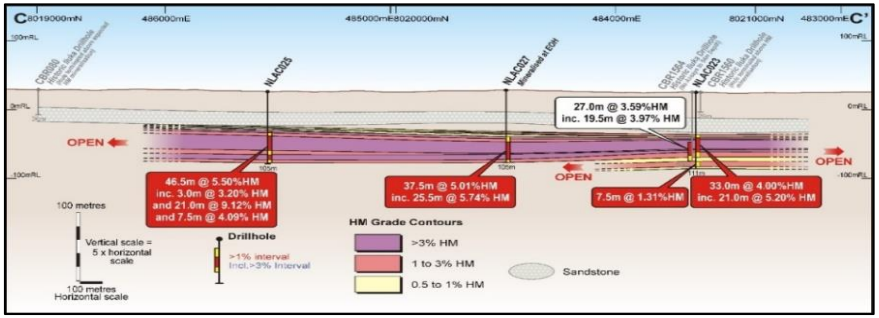
- Reliable, efficient, clean: The advantage of using LNG at Thunderbird include providing a low cost, low emission fuel source.
- Value creation: the LNG arrangement will enable Sheffield to capture long-term gas supply cost savings that were not contemplated in the BFS, March 2017.
- Regionally sourced fuel consumed within the region and not exported
- The NAIF funding enables in-sourcing, providing significant reduction in operating costs compared to BFS assumptions – representing new value.
- Provides pathway for Sheffield to own the infrastructure and provides for lower operating costs when compared to the Thunderbird BFS.
- NAIF's approval of a loan on the terms and tenor defined in the term sheets is a significant milestone for Thunderbird and will underpin many hundreds of jobs in the Kimberley region over several decades.

Significant regional exploration upside

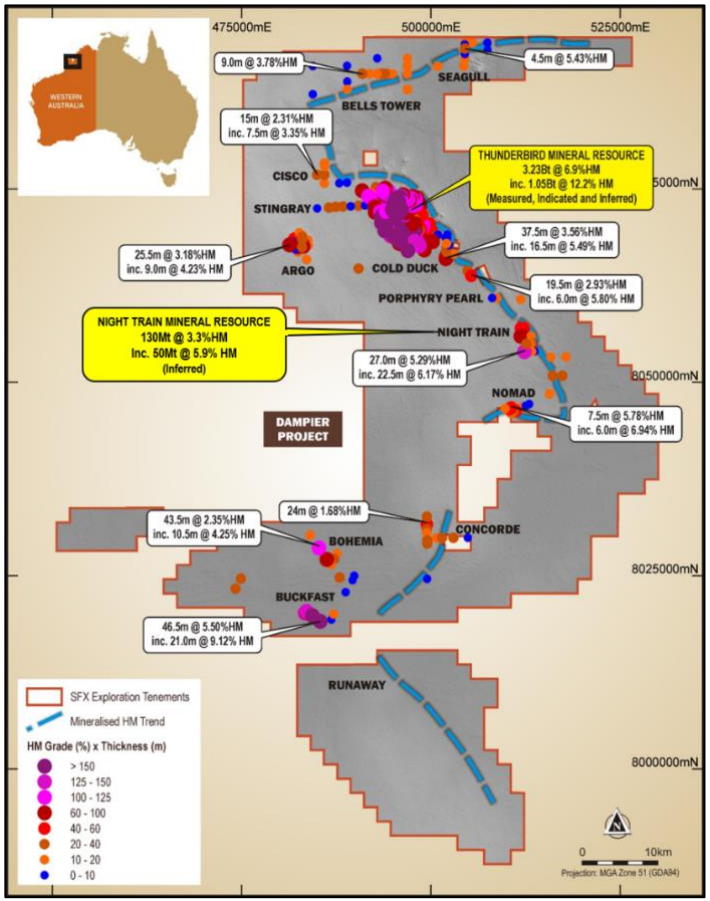
Strategic value of the Dampier Project demonstrated through multiple discoveries made along a 160km long trend

- Exploration has delineated 14 zones of **significant mineralisation along a 160km** long highly mineralised trend which extends from Seagull in the north to Runaway in the south (see picture on the right)[1]
- Maiden high grade **Mineral Resource outlined at Night Train** [1]
- **Three substantial new mineral sands discoveries** have been outlined at Buckfast, Bohemia and Concorde
  - Characterised by broad sheet-like geometries, thick (up to 51m) intersections, and mineral assemblages with high proportions of VHM dominated by leucoxene, altered ilmenite and zircon with low to moderate levels of trash
  - Opens up a new 60km long highly prospective corridor south of Thunderbird
- Thick high grade intervals have been intersected, including;
  - 46.5m @ 5.50 % HM from 57.0m (NLAC025), including 21.0m @ 9.12% HM from 64.5m (Buckfast)
  - 37.5m @ 5.01% HM from 67.5m (NLAC027), including 25.5m @ 5.74% HM from 75m (Buckfast)
- **Numerous targets identified for follow-up drilling scheduled for Q2-Q3 2019**
- New tenement applications lodged to cover an additional 600km^2 of prospective ground

Buckfast – Cross Section[2]



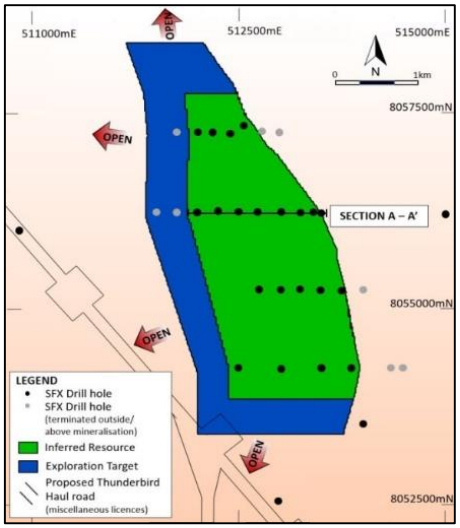
Dampier Project – Regional Plan[1]



1. Refer to ASX announcement 31 January 2019
2. Refer to ASX announcement 13 November 2018

Night Train deposit

Night Train confirmed as a major new mineral sands deposit

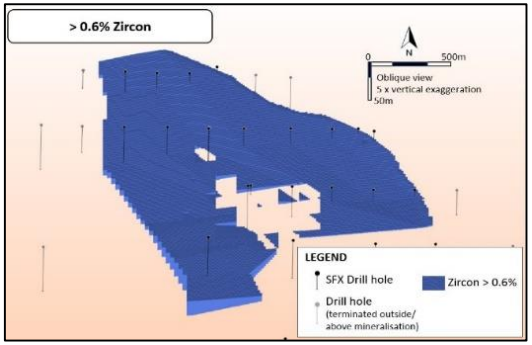


- Maiden high grade Mineral Resource outlined at Night Train with high in-situ zircon grades and high mineral assemblage value
- Located just 20km south of the Thunderbird deposit and 2km from the recently constructed Thunderbird mine access road
- Includes coherent high-grade component of 50Mt @ 5.9% HM, containing 2.6Mt of VHM
- Additional large exploration target of 80Mt to 100Mt at 3.0% to 4.0% HM estimated at Night Train
- Further discoveries have the potential to extend Thunderbird's 42 year mine life and will provide greater flexibility for future development

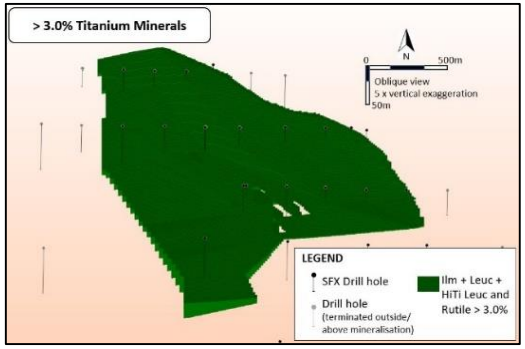
Night Train Deposit Mineral Resource [1]

				Valuable HM grade (In-Situ, %)			
Category	Cut off (HM%)	Material (Mt)	HM (%)	Zircon	HiTi Leucoxene	Leucoxene	Ilmenite
Inferred	1.2	130	3.3	0.5	0.2	1.5	0.7
Inferred	2.0	50	5.9	0.8	0.3	2.9	1.1

Resource block model > 0.6% in-situ zircon grade



> 3.0% combined in-situ titanium mineral grade



Panned HM from Night Train

The potential quantity and grade of the Exploration Target is conceptual in nature, as there has been insufficient exploration to estimate a Mineral Resource and it is uncertain if further exploration will result in the estimation of a Mineral Resource.

1. Refer to ASX announcement 31 January 2019, Competent Person Statement is located on Slide 2 of this Presentation

Summary

- Thunderbird is a **large high grade deposit with a 42 year mine life**
- Thunderbird is the **largest undeveloped zircon deposit in the world**
- The project is **fully permitted and shovel ready**
- Multiple exploration discoveries confirms a new zircon rich province
- Consensus supports a **significant zircon structural supply deficit for the next decade**
- Industry and consumers have indicated the need for Thunderbird to come on stream
- **~A$340m of debt secured** confirming quality of project economics
- **EPC turnkey contract signed** with leading Australian engineering group
- **BFS update** targeting capital reduction and improvement of Thunderbird economics
- Leading global bank UBS appointed to seek a strategic partner

Appendix A

Other information

Experienced Board and management

Will Burbury
Non-Executive Chairman

Previously Chairman of Warwick Resources Limited in 2009 and was formerly a director of Lonrho Mining Limited (ASX: LOM) and an executive of Nkwe Platinum Ltd (ASX: NKP)

Bruce McFadzean
Managing Director

Mining engineer with over 40 years experience leading the financing, development and operation of mines in Australia and overseas

David Archer
Technical Director

Geologist with over 30 years experience Australian resources sector

Bruce McQuitty
Non-Executive Director

35 years experience in the mining and civil construction industries and was previously Managing Director of Warwick Resources Limited

Mark Di Silvio
CFO / Company Secretary

CPA with over 25 years experience in the resources sector working across Africa and Australia

Stuart Pether
Chief Operating Officer

Mining engineer *with* over 25 years technical and operating experience in the resources industry, both in Australia and overseas

Jim Netterfield
General Manager Process & Engineering

Mechanical engineer with a proven track record in successfully managing mineral development projects through to production

Neil Patten-Williams
General Manager Manager

Experienced mineral sands marketing and operations manager with over 18 years experience in the mineral sands industry.

Vanessa Hughes
General Manager People & Community

Qualified human resource executive with more than 25 years experience in Australia and Africa

Geoff Williams
General Manager Operations

Mining engineer with over 25 years mining experience in operational roles. A resident of Broome, having lived and worked in the Kimberley for many years

TBA
Project Director

Oversee and hold to account, the delivery of the EPC contract for the process plant & other non-processing infrastructure construction works for the Thunderbird Project

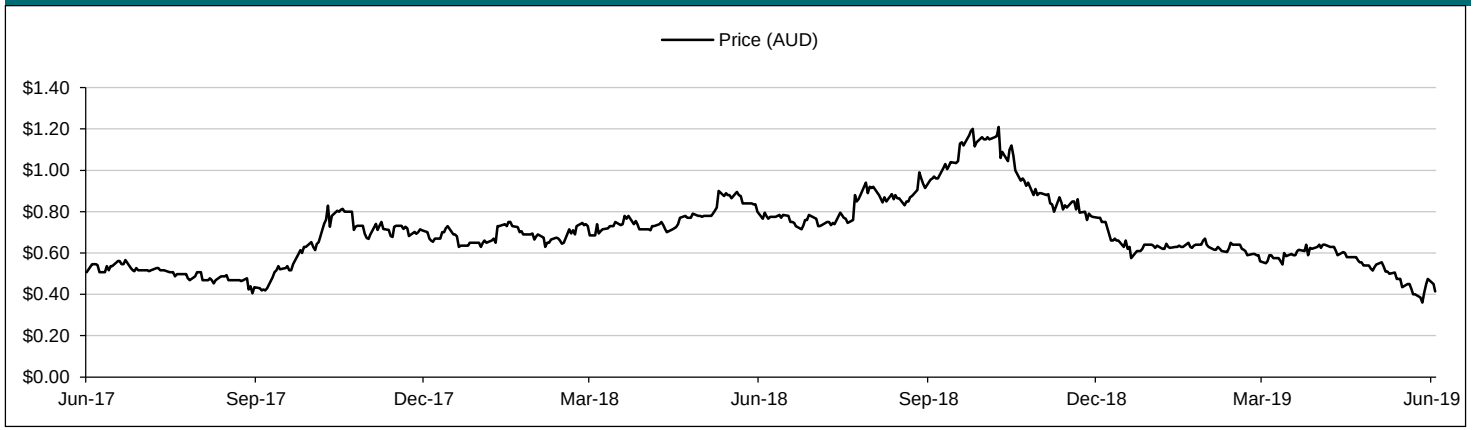
Justin King
Community Superintendent

A trusted community leader in the Kimberley region with experience as Aboriginal Liaison Officer within the mining sector & an abiding commitment to Aboriginal people

Sheffield snapshot

Sheffield is focused on development of the large scale, high quality Thunderbird mineral sands project

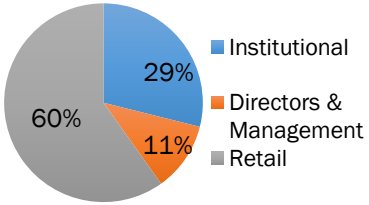
Last 2 years share price performance



Capitalisation

Share price (4-Jun-2019)	*A$/sh*	$0.42
Ordinary shares outstanding	*m*	258
Market capitalisation	***A$m***	**$107**
(+) Debt	*A$m*	nil
(-) Cash (31-Mar-2019)	*A$m*	$5.8
Enterprise value	***A$m***	**$101**

Major Shareholders

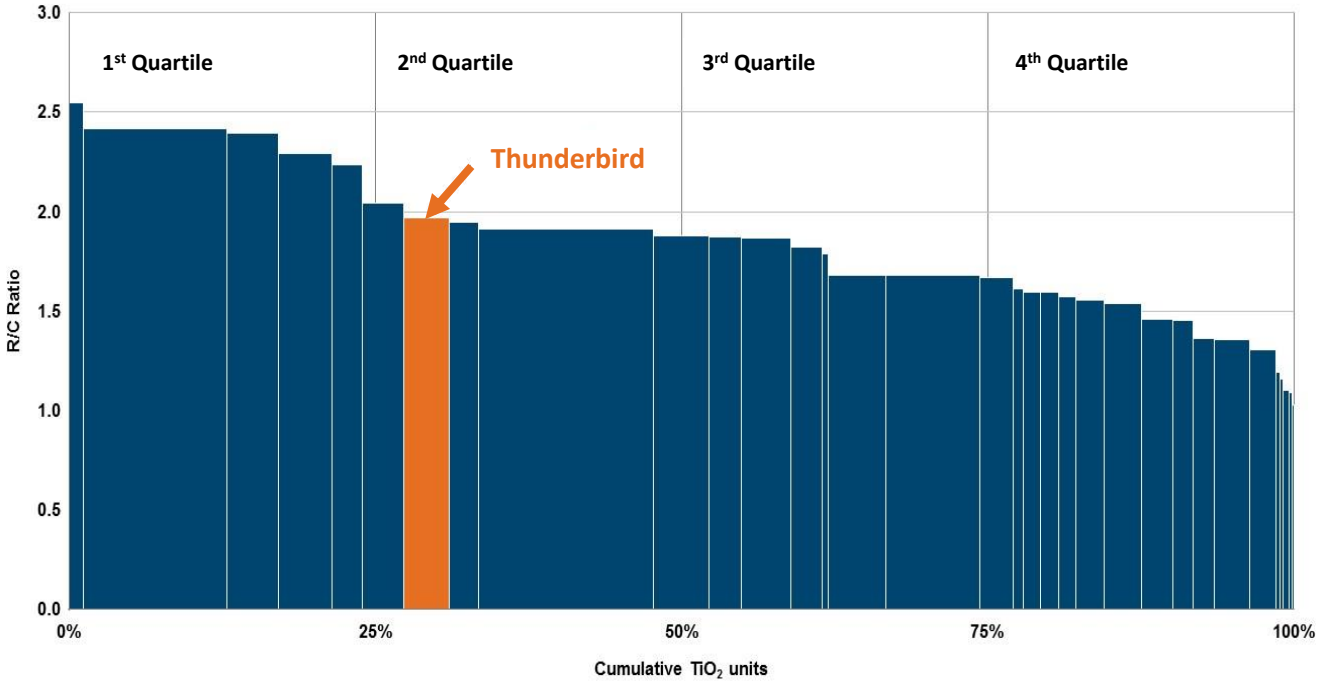


BlackRock	10%
Colonial First State	6%
Other Institutions	13%
Walter Yovich	6%

Source: IRESS, company filings
Market data as at 4 June 2019

A second quartile producer

TZMI assess Thunderbird to have a competitive revenue to cost ratio



Source: TZMI

Notes:

1. **Cautionary Statement:** Thunderbird's cost position is as estimated by TZMI and based on the March 2017 Thunderbird BFS, and assuming a 4 year production period following Stage 1 ramp-up (Year 3 to Year 7 of operation) based on Sheffield BFS. Accordingly, the information set out in this slide is not and should not be interpreted as a forecast. Sheffield does not have sufficient certainty (and therefore does not yet have a reasonable basis) in order to issue any cost or revenue forecasts)
2. 2020 Cost Curve as presented by TZMI
3. Note that several of the competitors presented here are integrated producers of downstream feedstock and associated by products

Ore reserves

Thunderbird deposit ore reserves[1,4]

Valuable Heavy Mineral (VHM) in-situ grade

Ore Reserve Category	Ore Tonnes (millions)	In-situ HM Tonnes (millions)	HM Grade (%)	Valuable HM Grade (In-situ)[2]				Slimes (%)	Osize (%)
				Zircon %	HiTi Leuc %	Leuc %	Ilmenite %		
Proved	235.8	31.4	13.3	1.00	0.29	0.26	3.55	16.5	13.7
Probable	444.8	45.4	10.2	0.80	0.26	0.26	2.85	15.2	11.0
Total	**680.5**	76.8	**11.3**	**0.87**	**0.27**	**0.26**	**3.10**	**15.7**	**12.0**

Mineral assemblage as percentage of HM grade

Ore Reserve Category	Ore Tonnes (millions)	In-situ HM Tonnes (millions)	HM Grade (%)	Mineral Assemblage[3]				Slimes (%)	Osize (%)
				Zircon (%)	HiTi Leuc (%)	Leuc (%)	Ilmenite (%)		
Proved	235.8	31.4	13.3	7.5	2.2	1.9	26.7	16.5	13.7
Probable	444.8	45.4	10.2	7.8	2.5	2.6	28.0	15.2	11.0
Total	**680.5**	76.8	**11.3**	**7.7**	**2.4**	**2.3**	**27.4**	**15.7**	**12.0**

1. Ore Reserves are presented both in terms of in-situ VHM grade, and HM 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 Reserve is reported to a design overburden surface with appropriate consideration of 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.
3. Mineral Assemblage is reported as a percentage of HM Grade, it is derived by dividing the in-situ grade by the HM grade.
4. Ore Reserves reported for the Dampier Project were prepared and first disclosed under the JORC Code (2012), refer to Sheffield's ASX announcement dated 16 March 2017 for further detail.

Mineral resources

THUNDERBIRD DEPOSIT MINERAL RESOURCE[1,2,7]

Cut-off (HM%)	Mineral Resource Category	Material Tonnes (millions)	In-situ HM Tonnes (millions)	HM Grade[3] (%)	Valuable HM Grade (In-situ)[4]				Slimes (%)	Osize (%)
					Zircon (%)	HiTi Leuc (%)	Leuc (%)	Ilmenite (%)		
> 3% HM	Measured	510	45	8.9	0.71	0.20	0.19	2.4	18	12
	Indicated	2,120	140	6.6	0.55	0.18	0.20	1.8	16	9
	Inferred	600	38	6.3	0.53	0.17	0.20	1.7	15	8
	Total	**3,230**	**223**	**6.9**	**0.57**	**0.18**	**0.20**	**1.9**	**16**	**9**
>7.5% HM	Measured	220	32	14.5	1.07	0.31	0.27	3.9	16	15
	Indicated	640	76	11.8	0.90	0.28	0.25	3.3	14	11
	Inferred	180	20	10.8	0.87	0.27	0.26	3.0	13	9
	Total	**1,050**	**127**	**12.2**	**0.93**	**0.28**	**0.26**	**3.3**	**15**	**11**

Cut-off (HM%)	Mineral Resource Category	Material Tonnes (millions)	In-situ HM Tonnes (millions)	HM Grade (%)	Mineral Assemblage[5]				Slimes (%)	Osize (%)
					Zircon (%)	HiTi Leuc (%)	Leuc (%)	Ilmenite (%)		
> 3% HM	Measured	510	45	8.9	8.0	2.3	2.2	27	18	12
	Indicated	2,120	140	6.6	8.4	2.7	3.1	28	16	9
	Inferred	600	38	6.3	8.4	2.6	3.2	28	15	8
	Total	**3,230**	**223**	**6.9**	**8.3**	**2.6**	**2.9**	**28**	**16**	**9**
>7.5% HM	Measured	220	32	14.5	7.4	2.1	1.9	27	16	15
	Indicated	640	76	11.8	7.6	2.4	2.1	28	14	11
	Inferred	180	20	10.8	8.0	2.5	2.4	28	13	9
	Total	**1,050**	**127**	**12.2**	**7.6**	**2.3**	**2.1**	**27**	**15**	**11**

THUNDERBIRD DEPOSIT CONTAINED VALUABLE HM (VHM) IN MINERAL RESOURCES[1,2,6]

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

1. Refer to ASX announcement of 30 January 2019 ("Quarterly Activities Report") for further information, explanations and qualifications
2. The Thunderbird Mineral Resources are reported inclusive of (not additional to) Ore Reserves. The Mineral Resource reported above 3% HM cut-off is inclusive of (not additional to) the Mineral Resource reported above 7.5% HM cut-off.
3. 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.
4. Total heavy minerals (HM) is within the 38µm to 1mm size fraction and has been reported as a percentage of the total material quantity.
5. The Valuable HM in-situ grade is reported as a percentage of the total material quantity and is determined by multiplying the percentage of total HM by the percentage of each valuable heavy mineral within the HM assemblage at the resource block model scale.
6. 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 and; 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 fraction was analysed by XRF and minerals determined as follows: Zircon ZrO_2+HfO_2/0.667 and HiTi Leucoxene TiO_2/0.94.
7. The VHM inventory is derived from information in the Mineral Resource tables.
8. The Mineral Resource estimate was prepared and first disclosed under the JORC Code (2012), refer to Sheffield's ASX announcement dated 5 July 2016 for further detail.

Mineral resources

Night Train Mineral Resources: Valuable Heavy Mineral in-situ grade[1]

Mineral Resource Category	Cut off (HM%)	Ore Tonnes (Mt)	HM Grade (%)	Valuable Heavy Mineral Grade (In-situ)[2,3]					
				Zircon (%)	HiTi Leucoxene & Rutile (%)	Leucoxene (%)	Ilmenite (%)	Slimes (%)	Oversize (%)
Inferred	1.2	130	3.3	0.45	0.18	1.5	0.71	8.7	2.2
Inferred	2.0	50	5.9	0.82	0.33	2.9	1.06	10.2	2.2

Night Train Mineral Resources: In-Situ Tonnes[1]

Mineral Resource Category	Cut off (HM%)	HM Tonnes (Mt)	In-situ Tonnes[4]				
			Zircon (kt)	HiTi Leucoxene & Rutile (kt)	Leucoxene (kt)	Ilmenite (kt)	Total VHM (kt)
Inferred	1.2	4.2	560	220	1,900	900	3,590
Inferred	2.0	3.0	420	170	1,500	540	2,600

Notes:

1. Refer to ASX Announcement on 31 January 2019 titled *"High Grade Maiden Mineral Resource at Night Train"* for further information, explanations and qualifications. The Mineral Resource estimate was prepared by Optiro Pty Ltd and disclosed under the JORC Code (2012). Total HM is within the 38µm to 1mm size fraction and reported as a percentage of the total material, slimes is the -38µm fraction and oversize is the +1mm fraction. 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
2. In-situ assemblage 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
3. Estimates of Mineral Assemblage are presented as percentages of the Total Heavy Mineral (THM) component of the deposit, as determined by magnetic separation, QEMSCANTM and XRF for one of 12 composite samples. Magnetic fractions were analysed by QEMSCANTM for mineral determination as follows: ilmenite: 40-70% TiO_2 >90% liberation; leucoxene: 70-90% TiO_2 >90% liberation; high titanium leucoxene (HiTi leucoxene) and rutile combined > 90% TiO_2 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. HM assemblage determination was by the QEMSCANTM process for 11 of 12 composite samples which uses observed mass and chemistry to classify particles according to their average chemistry, and then report mineral abundance by dominant % mass in particle. For the TiO_2 minerals the following breakpoints were used to distinguish between ilmenite 40% to 70% TiO_2, leucoxene 70% to 90% TiO_2, high TiO_2 leucoxene and rutile > 90%
4. The contained in-situ tonnes for the valuable heavy minerals were derived from information from the in-situ grades and tonnes of the Mineral Resource