20 March 2023

MAKUUTU STAGE 1 DFS CONFIRMS TECHNICAL AND FINANCIAL VIABILITY FOR SUSTAINABLE, LONG-LIFE SUPPLY OF MAGNET AND HEAVY RARE EARTHS, MAIDEN ORE RESERVE ESTIMATE

STAGE 1 KEY DEFINITIVE FEASIBILITY STUDY (DFS) HIGHLIGHTS

- **The Mining Licence Application (MLA) focuses on the Stage 1 DFS and provides for a 35-Year mine life based on the Indicated Mineral Resource over Retention Licence 1693 (Application TN03834);**
- **Stage 1 DFS delivers an EBITDA of A$2.29 billion (US$1.60 billion[1]), Post Tax Free Cash Flow total ~ A$1.46 billion (US$1.02 billion), Net Present Value (NPV_8) (Pre-tax) of A$580 million (US$406 million) and an Internal Rate of Return (IRR) of 32.7%;**
- **Stage 1 production of a value-added product, mixed rare earth carbonate (MREC) (including Scandium), via a modular heap desorption processing plant, amounts to a total Capital Expenditure (CAPEX) of US$120.8 million;**
- **Stage 1 plant capacity is 5.0 million tonne per annum (Mtpa) Run of Mine (ROM) throughput;**
- **Stage 1 TREO production of 40,090 tonnes (t) REO equivalent product, with 71% magnet plus heavy REO content;**
- **Stage 1 Rare Earth Oxide (REO) anticipated production capacity is ~ 1,300 tpa REO over first 10 years, averaging ~1,160 tpa over 35-years of production;**
- **Maiden Ore Reserve for the Makuutu Stage 1 over RL 1693 of 172.9 Mt at 848 ppm TREO, or 584 ppm TREO – CeO_2, and 30 ppm Sc_2O_3;**
- **Uniquely positioned to be a long-term sustainable magnet and heavy REO producer, with first MREC production targeted for Q4 2024; and**
- **Further staged development and expansion options will consider the total mineral resource at Makuutu.**

Strong Financial Metrics

- **Stage 1 Pre-tax NPV_8 of ~US$406 million (~A$580 million);**
- **Stage 1 Post-tax NPV_8 of ~US$278 million (~A$397 million);**

[1] USD to AUD FX = 0.70

- **Stage 1 Post-tax IRR of ~32.7%;**
- **Stage 1 Post-tax capital payback of ~3 years from first MREC production;**
- **Stage 1 Net Revenue totalling ~US$3.98 billion (~A$5.69 billion);**
- **Stage 1 Revenue forecast of ~US$92/kg REO equivalent produced (excluding Sc_2O_3), payable;**
- **Stage 1 EBITDA totalling ~US$1.60 billion (~A$2.29 billion); and**
- **Post Tax Free Cash Flow totalling ~ US$1.02 billion (~A$1.46 billion).**

Physical Parameters

- **Stage 1, over MLA TN03834, provides an initial 35-year Probable Ore Reserve Estimate of 172.9 Mt @ 848 ppm Total Rare Earths Oxide (TREO) for 146,654 of contained TREO;**
- **Stage 1 strip ratio of 0.57; and**
- **Scandium Oxide by-product credit (~511 t Sc_2O_3) is included as Base Case.**

Capital and Operating Costs

- **Pre-production CAPEX (including 10% contingency) of ~US$120.8 million, including mining fleet;**
- **All In Sustaining Cost (AISC) for the operation is ~US$12.40/t ROM feed;**
- **AISC for the operation is ~US$53/kg REO equivalent produced;**
- **AISC for the operation is ~US$46/kg REO equivalent produced (including Sc_2O_3 by-product credit); and**
- **Power for the Project is to be delivered from low-cost hydroelectric power accessible from 132 kV power transmission corridor running immediately through the Project tenements.**

The Board of Ionic Rare Earths Limited ("IonicRE" or "The Company") (ASX: IXR) is pleased to advise the results of the Definitive Feasibility Study (DFS or Study) for the Stage 1 development of the Makuutu Rare Earths Project ("Makuutu" or "the Project") which has been conducted and signed off by a series of independent competent persons. Much of the hydrometallurgical flowsheet for the Project has been developed by expert competent persons specifically for Makuutu, being a large near surface ionic adsorption clay deposit. This bespoke Intellectual Property (IP) will remain a valuable asset in optimising financial returns from Makuutu as further activity, including a Demonstration Plant, progresses to unlock further value through providing scale up data to adopt more informed information on grade control, material handling and heap desorption conditions including heap stack height.

Makuutu is being developed by Rwenzori Rare Metals Limited (RRM), a Ugandan private company which owns 100% of the Makuutu Rare Earths Project. IonicRE is a 51% owner of RRM and moving to 60% with the completion of the DFS. IonicRE also maintains a first right over the remaining 40% of the Project.

The Makuutu Stage 1 Study has been prepared to support the application for the granting of the Mining Licence over RL 1693, via Mining Licence Application (MLA) TN03834 which RRM initiated in September 2022, and as such covered only the central area of the greater Makuutu resource area. It is anticipated that following the DFS, the Mining Licence over RL 1693 will be granted in Q2 2023. A further staged development approach, including additional MLAs over the other five (5) tenements at Makuutu will progressively be considered which will cover the total Mineral Resource at Makuutu.

IonicRE's Managing Director Mr Tim Harrison stated;

"The outcome of this study, which focuses solely on the central Makuutu zone, provides the required inputs for Rwenzori Rare Metals Limited to now finalise the Mining Licence Application for RL 1693. These Stage 1 results support what we think is a unique, geopolitically strategic asset to supply magnet and heavy rare earths into western supply chains. Evidence currently shows that countries are motivated to secure sustainable, traceable supplies of these critical raw materials to support their domestic manufacturing ambitions and to support both the energy transition, and increasingly, military and defence requirements to provide sovereign capability and global security.

"Furthermore, this Stage 1 study provides a path to production at Makuutu, which has the potential for significant growth into the future through the conversion of the other tenements at Makuutu towards additional MLAs over the coming decade. The intent is to significantly increase production from the Stage 1 initial focus at Makuutu, and expand into the forecast increase in demand that will far exceed supply for the most readily sought after rare earths, being Dysprosium and Terbium. These rare earths, are critical for the production of the magnets required to drive electric vehicles, offshore wind turbines and support a number of specialised defence applications.

"Makuutu is now advancing towards a Final Investment Decision with the capability to provide more heavy rare earths per annum from our initial Stage 1 Project than existing western light rare earth hard rock mines in production today.

"The next phase of work at Makuutu, is to build the Demonstration Plant to further drive value by proving the potential to achieve high desorption heap stack heights to improve capital efficiency with a view to further increasing production capacity, whilst optimising desorption conditions to explore improved extractions and minimising the dissolution of impurities, to further optimise economics."

Makuutu Rare Earth Project – Stage 1 Overview

Rwenzori Rare Metals Limited (RRM), a Uganda registered private limited company, is investigating the development of the Makuutu Rare Earths Project located 120 kilometres (km) east of Kampala, Uganda, illustrated in Figure 1. RRM owns 100% of the Makuutu Rare Earths Project.

This DFS has been completed in conjunction with RRM's major shareholder, Ionic Rare Earths Limited (IonicRE) (51% of RRM moving to 60% upon approval of the DFS as per RRM earn in agreement announced 5 July 2019). IonicRE has collaborated with the other shareholders of RRM plus independent consultants to complete this DFS.

The Project has been explored since 2012. RRM, and shareholders have completed all exploration works on the Project, which includes Retention Licenses RL 1693, RL 00007, RL00234 and Exploration Licenses EL 00147, EL 00148 and EL 00257.

Since August 2019, IonicRE has funded exploration and project development activities which includes nearly 12,953 completed meters of core drilling across the three licenses, initial metallurgical variability and optimisation test work, mine planning and process design estimation.

This DFS, which focuses on the Makuutu central tenement, Retention Licence 1693, is the first of RRM's six (6) tenements to progress to the MLA stage, driven by the timeline controlled under the Ugandan Mining Act to progress from Exploration Licence to Retention Licence, and ultimately to Mining Licence Application within an 11-year period.

Figure 1: Makuutu Rare Earths Project location with major existing infrastructure.

The Stage 1 DFS contemplates a proposed open pit mining operation, and evaluation of an annualised mining rate of 5 Mtpa of mineralisation from the Project. Several scenarios were run to determine the optimal mine plan design. The revised Mineral Resource Estimate (MRE) in May 2022 was used as the basis for the preliminary mine plans and mining optimisation studies.

The economic analysis of the Makuutu Stage 1 development was completed by IonicRE, indicating the potential for an economic project, however several assumptions will require substantiation via additional work programs to be completed in the next phase of the Project.

The Stage 1 Project NPV, with Scandium production assumed, using a discount rate of 8%, was pre-tax, US$406 million, and post-tax US$278 million, and an IRR of 32.7%. The payback period was determined at three (3) years from first production.

The Makuutu Stage 1 development will also be a significant contributor to Uganda, with estimated gross royalty payments of US$199 million plus corporate tax contributions of US$438 million over the Stage 1 development of the Project, based upon only RL1693 at this stage.

All capital, operating and revenue inputs used in the DFS are on a US dollar basis.

A summary of the Makuutu Stage 1 DFS results are provided in Table 1. The financial modelling of the DFS has been carried out on a 100% ownership basis to determine Project value.

Table 1: Makuutu Stage 1 DFS Financial and Technical Summary.

Parameter	Unit	DFS Results
Stage 1 Duration	Years	35
Stage 1 Feed, dry	Mt	172.9
Stage 1 Waste, dry	Mt	98.8
Stage 1 Strip Ratio	Mt	0.57
Stage 1 TREO Head Grade	ppm	848
Stage 1 TREO-CeO_2 Head Grade	ppm	584
Total REO Feed	Kt	146.7
Total REO Production	Kt	40.1
Average REO Production	t/a	1,156
Stage 1 Sc_2O_3 Head Grade	ppm	30
Total Sc_2O_3 Feed	t	5,112
Total Sc_2O_3 Production	t	511
Annual Average Sc_2O_3 Production	t/a	15
Recoveries – TREE-Ce	%	35%
Yield – TREO-CeO_2	ppm	208
MREC Payability	%	70%
Total Stage 1 Revenue	USD, M	3,984
REO Revenue, Stage 1	USD, M	3,707
Sc_2O_3 Revenue, Stage 1	USD, M	277
REO Revenue (excl Sc_2O_3), per t Ore	USD/t	21.44
REO Revenue (excl Sc_2O_3), per kg REO	USD/kg	91.64
Total Stage 1 OPEX	USD, M	2,143
Mining OPEX	USD, M	757
Processing OPEX	USD, M	1,309
G&A OPEX	USD, M	260
OPEX, annual average	USD, M	61.24
OPEX, per t Ore (dry)	USD/t	12.40
OPEX, per kg REO	USD/kg	52.99
OPEX, per kg REO (less Sc_2O_3 credit)	USD/kg	46.13
Govt Royalties	USD, M	199
Social Fund Package – CSR	USD, M	40
CAPEX, upfront	USD, M	120.81
CAPEX, sustaining	USD, M	19.28
Tax	USD, M	438
Total Free Cash Flow	USD, M	1,023
EBITDA	USD, M	1,602
Pre-Tax NPV_8 (01-Jul-23)	USD, M	406
Post-Tax NPV_8 (01-Jul-23)	USD, M	278
IRR	%	32.7%
Payback from First Production	Years	3

Ionic Rare Earths Limited, Level 1, 34 Colin Street, West Perth WA 6005 Australia T+61 3 9776 3434 E admin@ionicre.com

The forecast REO production over the Stage 1 development, for a mine life of 35 years indicated a total of 40,448 tonnes of REO equivalent product, as a MREC, a value-added product, with approximately 71% magnet and heavy REO content within.

The average head grade over the first ten years is 928 ppm TREO (652 ppm TREO-CeO_2) generating an average production of 1,303 tonnes per annum of REO equivalent MREC product. After that, given the reduction in TREO head grade from years 11 to 35, to 814 ppm TREO (554 ppm TREO-CeO_2), the average REO production over the last 25 years of operation is 1,097 tonnes per annum.

RRM will continue to implement the highest levels of Environmental, Social and Corporate Governance (ESG) compliance and standards in developing and operating the Project. RRM aims to establish a long life, sustainable mining operation with a dominant Ugandan workforce composition that can ultimately be the template for successful mining projects within Uganda, and Eastern Africa.

Definitive Feasibility Study

The DFS report has been prepared by IonicRE based upon a review of project specific information including geological reports, maps, assessment files, retention and exploration licenses, technical papers and spreadsheets, publicly available reports and data generated by RRM and IonicRE over the past four (4) years.

IonicRE has coordinated a group of leading industry consultants during 2021 and 2022 to complete technical and commercial studies into the Project in support of the DFS, in addition to initiating environmental and social impact assessment studies.

Contributing consultants include:

- Geological Management and Studies: Geoff Chapman, GJ Exploration Pty Ltd (Australia).
- Technical Field Services: Benzu Minerals Ltd (South Africa);
- Environmental and Social Impact: Environmental Plus Pty Ltd (Australia), JBN Consults & Planners Ltd and Atacama Consultants Ltd (UG);
- Metallurgical Testwork: ALS Metallurgy (Australia), Australian Nuclear Science and Technology Organisation (ANSTO) (Australia), Bureau Veritas Minerals (Australia), SGS Lakefield (Canada) and HydroGeoSense (USA);
- Metallurgical Testwork: Harley Davies, Ultramet Ltd (Australia);
- Metallurgical Simulation Modelling and Process Design: Dr Will Goodall, MinAssist Pty Ltd (Australia);
- Mineral Resource Estimation: Daniel Saunders, Cube Consulting Pty Ltd (Australia);
- Mine Planning: Lee White, Kalem Group Pty Ltd (Australia);
- Mine Operating Estimation: ADT Africa, Kampala (Uganda);
- Process Plant Design, Capital Estimation and Operations Estimation: Mincore Pty Ltd (Australia);
- Membrane Technology Plant Design: Eco Technol (Pty) Ltd (Australia);
- Financial Modelling: Lee Platek, Platek Analytics Pty Ltd (Australia); and
- Rare Earth Marketing Study, Adamas Intelligence (Canada).

Project Design Philosophy

The Makuutu Rare Earths Project hosts an ionic adsorption clay hosted rare earth deposit. As a result, the weathered mineralisation can be processed using an ionic desorption process, akin to chemical ion exchange process.

Under the Project design, the near surface mineralisation, under approximately three (3) metres (m) of cover, is to be mined using free dig bulk mining methods, with a low strip ratio, to feed to a processing facility, which chemically washes the ore with a salt-based solution, using ammonium sulfate (NH_2SO_4), at mild acidic conditions, using sulfuric acid (H_2SO_4) at an approximate pH of 2, which extracts the rare earth elements into a value added intermediate chemical precipitate known as MREC. The MREC product produced is a high payability value product (~70%), free of radionuclides, suitable for export for further processing via solvent extraction refining to high purity oxides.

Post processing, the residue is washed to recover residual reagents and process liquors, and neutralised prior to reclamation, and redeposition in the mining pit voids prior to rehabilitation of the mined areas. Subsequent new organised agri-industry will be established to align with Uganda's National Development Plan, NDP-III. As such there will be no tailings facility or permanent spoil heaps anywhere on the property.

The DFS considers only the initial RL 1693 for the purposes of the study, to support the MLA of the first of six (6) tenements that make up the greater Makuutu Project. It is envisaged that the Stage 1 development at Makuutu will be supported with further growth expected to be derived from other tenements at the Project which will progress to MLA with further exploration over the next decade. A full list of the tenements at Makuutu is provided in Table 2, showing that the MLA for RL 1693 was initiated in early September 2022. A map of the overall tenements and RL 1693 (MLA TN03834) is illustrated in Figure 2.

Table 2: Makutu Rare Earths Project Tenement Status and Details

Licence ID	Licence Type	Application Date	Granted Date	Expiry / Renewal Date	Area (km^2)
RL00007	Retention	12/12/2022	20/12/2022	26/11/2024	43.38
RL 1693 / TN03834	Retention	01/09/2022	Pending	Pending	43.78
RL00234	Retention	26/06/2021	06/07/2021	05/07/2024	47.03
EL00257	Exploration	15/07/2021	21/10/2021	20/10/2024	55.51
EL00147	Exploration	19/10/2020	28/12/2020	27/12/2023	60.30
EL00148	Exploration	21/10/2020	28/12/2020	27/12/2023	48.15

Highlighted row showing tenement supporting Stage 1 development for RL 1693 only, supporting the MLA application.

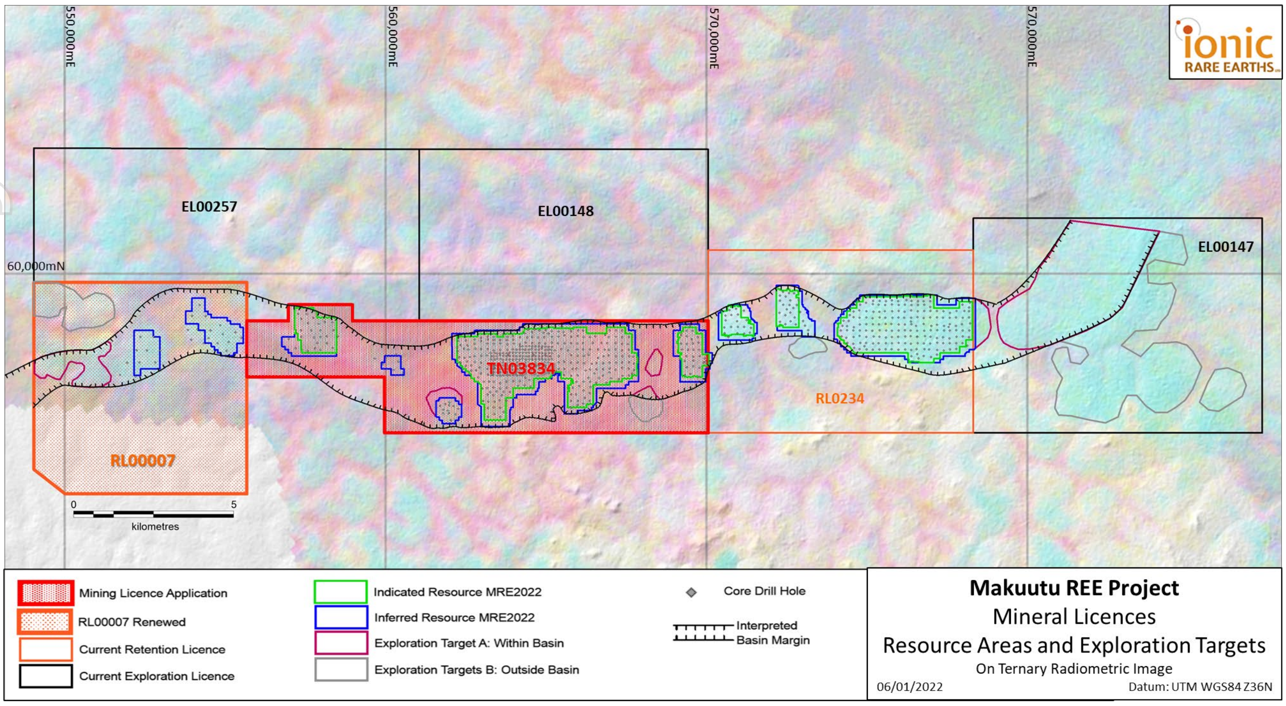


Figure 2: Makuutu Project resource map showing resources and exploration target areas, and the Stage 1 Mining Licence Application TN03834, which is the focus of the Feasibility Study.

Mining modelling has indicated that dilution and mining losses will be at a minimum.

Heap desorption leach processing has been chosen for the extraction methodology of the deposit. This process type lends itself to low-cost, large-scale operations as they are relatively simple in nature and robust in performance.

As a result of these criteria, the scale of operation chosen is a five (5) Mtpa mining and processing facility.

The relatively large operational scale is intended to take advantage of the uniform geometry and grade distribution throughout the large orebody. Given the scale of the Project, material handling logistics underpin the operability of the mining and processing with a centralised large heap desorption leach facility being located within central proximity to ore mined from several satellite, concurrently operating pits. The management of in-situ and ambient water is a key element to achieving operational targets.

The contracting philosophy that will be adopted is in line with other African mining projects with a strong focus on localisation. The Company believes that local stakeholders must enjoy the first opportunity to benefit from local value creation and the employment of foreign or non-local persons or contractors will be kept to a minimum.

The development philosophy is underpinned by the large scale of the deposit and the fact that the processing option selected will enable additional processing modules to be added in time across the full 37-km-long mineralisation trend at Makuutu.

Mineral Resource Estimate

The local geology interpretation of the Makuutu area has been compiled by RRM using the country wide airborne radiometric and magnetic survey imaging, ground gravity survey data, geological field observations, pitting and drilling. The Makuutu deposit is interpreted to be an ion-adsorption clay-type (IAC) rare earth element (REE) deposit similar to those in South China, Myanmar, Madagascar, Chile and Brazil. Ionic adsorption clay (IAC) REE mineralisation can be summarised as REEs that are mainly adsorbed onto the surfaces of clay minerals in the form of hydrated ions or hydroxyl-hydrated ions. These REE deposits are hosted within the regolith (laterite profile).

Three types of drilling have been conducted on the Project area. Initial drilling focused on open hole Rotary Air Blast (RAB) drilling with subsequent programs principally using diamond core drilling. Resource definition core drilling commenced in October 2019 initially on a 400-metre x 400-metre pattern over the Makuutu Central Zone (RL 1693) where previously RAB drilling identified the thickest and highest-grade clay hosted REE mineralisation. Since then, drilling has been completed across both the Makuutu Eastern Zone (RL00234) and Makuutu Western Zone (RL 00007).

Drilling completed by RRM since October 2019 has totalled 711 holes for 12,953m HQ triple tube (HQ3) sized vertical holes designed to provide high quality samples at an appropriate drill spacing to estimate a JORC compliant MRE, announced 3 May 2022, and for detailed metallurgical extraction test work.

Cube Consulting Pty Ltd (Cube) were engaged by RRM through IonicRE to provide a JORC 2012 Mineral Resource Estimate as outlined in Table 3. Figure 2 and Figure 3 illustrate the resource areas at Makuutu that support the Feasibility Study and the focus of the MLA over RL 1693. The MLA focused on the central Retention Licence (RL) 1693 and will provide the basis for initial mining at Makuutu. This area contains an Indicated Resource of 259 million tonnes at 740 ppm TREO (Table 2 and ASX: 3 May 2002), refer to Table 4. This is the basis for the Stage 1 DFS at Makuutu.

Table 3: Makuutu Rare Earth Project Resource Tabulation of REO Reporting Groups at 200ppm TREO-CeO_2 Cut-off Grade (ASX: 3 May 2022).

Resource Classification	Tonnes (millions)	TREO (ppm)	TREO-CeO_2 (ppm)	LREO (ppm)	HREO (ppm)	CREO (ppm)	Sc_2O_3 (ppm)
Indicated	404	670	450	500	170	230	30
Inferred	127	540	360	400	140	180	30
Total	532	640	430	480	160	220	30

Notes; Tonnes are dry tonnes rounded to the nearest 1.0Mt.
All ppm rounded from original estimate to the nearest 10 ppm which may lead to differences in averages. TREO = Total Rare Earth Oxide

Ionic Rare Earths Limited, Level 1, 34 Colin Street, West Perth WA 6005 Australia T+61 3 9776 3434 E admin@ionicre.com

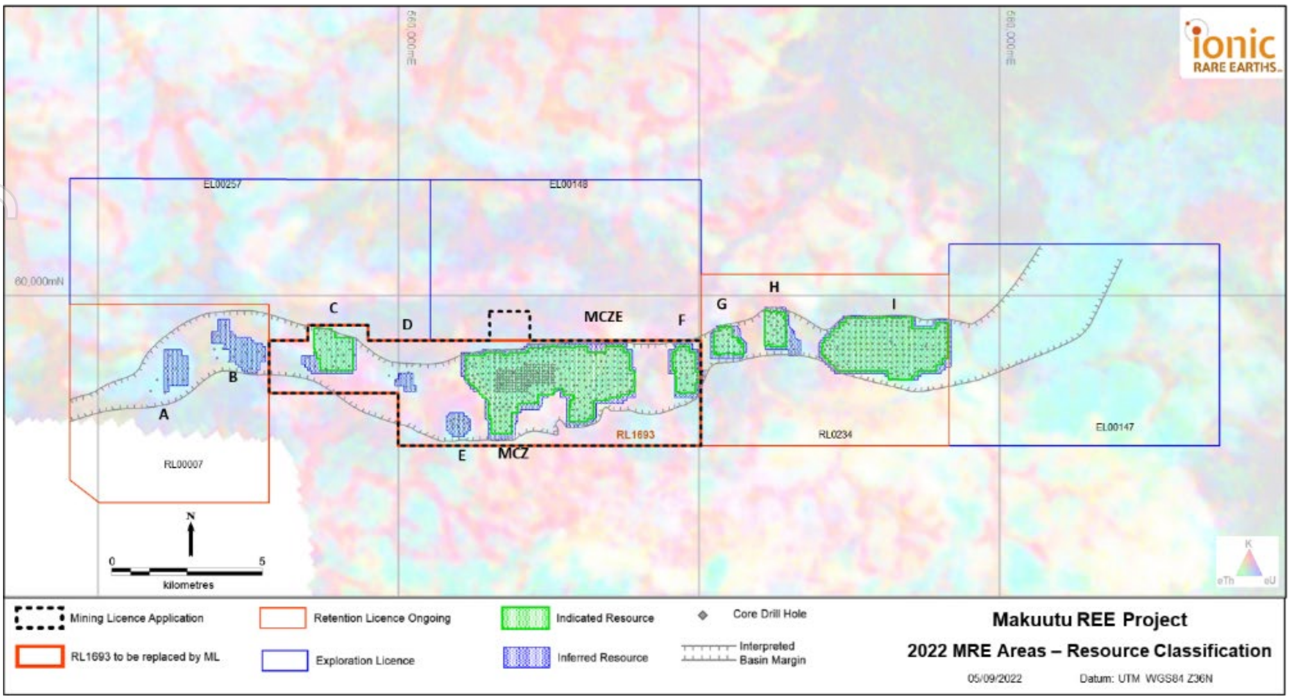


Figure 3: Makuutu Project resource map showing RL 1693 Mineral Resource Estimate areas which supports the Mining Licence Application TN03834, along with other tenement resource areas estimated to date, and additional exploration tenements across the 37 km mineralisation trend.

Table 4: Mineral Resources by Area (ASX: 3 May 2022), RL 1693 Resource Areas shaded blue to comprise basis for Stage 1 DFS.

Classification	Indicated Resource			Inferred Resource			Total Resource		
Area	Tonnes (millions)	TREO (ppm)	TREO-CeO_2 (ppm)	Tonnes (millions)	TREO (ppm)	TREO-CeO_2 (ppm)	Tonnes (millions)	TREO (ppm)	TREO-CeO_2 (ppm)
A				13	580	390	13	580	390
B				26	410	290	26	410	290
C	31	580	400	3	490	350	35	570	400
D				6	560	400	6	560	400
E				18	430	280	18	430	280
Central Zone	151	780	540	12	670	460	163	770	530
Central Zone East	59	750	490	12	650	430	72	730	480
F	18	630	420	7	590	400	25	620	410
G	9	750	500	5	710	450	14	730	480
H	6	800	550	7	680	480	13	740	510
I	129	540	350	19	530	350	148	540	350
Total Resource	**404**	**670**	**450**	**127**	**540**	**360**	**532**	**640**	**430**

Rounding has been applied to 1Mt and 10ppm which may influence averaging calculations.
Highlighted rows providing Indicated Resource Estimate for RL 1693 only, supporting the MLA.

Maiden Ore Reserve Estimate

A Maiden Ore Reserve Estimate has also now been completed for the Makuutu Stage 1 Project across RL 1693, based on the Indicated Mineral Resource (based on a 200ppm TREO-CeO_2 cut-off grade) tabled above. The Mineral Resources reported are inclusive of the Ore Reserves for the Stage 1 Project.

As shown in Table 5 below, total current Ore Reserves for the Makuutu Stage 1 over RL 1693 are 172.9 Mt at 848 ppm TREO, or 584 ppm TREO – CeO_2, and 30 ppm Sc_2O_3.

Table 5: Maiden Makuutu Stage 1 Ore Reserve Estimate.

Classification	Tonnage (Mt)	TREO Grade (ppm)	TREO-CeO_2 Grade (ppm)	LREO (ppm)	HREO (ppm)	CREO (ppm)	Sc_2O_3 (ppm)
Proven	-	-	-	-	-	-	-
Probable	172.9	848	584	629	219	296	30
Total	**172.9**	**848**	**584**	**629**	**219**	**296**	**30**

Mining and Material Handling

After a review of several scenarios, a 5 Mtpa throughput represented the Base Case (defined below) and also the optimal case, based on return on investment. It is estimated that the development approach enabled the Company to place the product into western supply chains, with expected timing to receive the product from late 2024. Additionally, the staged development of the Project limits initial capital investment to enable the downstream supply chain, ex-China, to mature to take the additional product from Makuutu at higher anticipated REO pricing.

An opportunity to scale up production in 2.5 Mtpa modules has also been identified but does not form part of this economic assessment at this time given the lack of maturity in existing western rare earth supply chains, and the fact that expected downstream refining capacity is:

1. Suitable for processing a basket product such as that from Makuutu, i.e. medium Yttrium (Y), high Europium (Eu); and
2. Only expected to be operational by late 2024 at the earliest.

The mine plan was developed using only Indicated Resources into the mining and processing schedule. Over the first 35 years of mining and processing operations at Makuutu, a Mineral Resource inventory of 172.9 Mt is proposed to be mined and processed. This constitutes the maiden Ore Reserve Estimate at Makuutu.

Figure 4 illustrates the annual total mining rate that has been used in the Study, which has been smoothed to ensure the fleet requirements are best optimised.

For the Stage 1 scenario adopted for the DFS, the nominated production case resulted in a higher plant feed grade, at 928 ppm TREO (652 ppm TREO-CeO_2), using a 500ppm TREO-CeO_2 cut-off during the first 10 years of mining followed by a relaxation of the cut-off and also processing lower grade material stockpiled (Base Case). TREO head grade is also illustrated in Figure 4.

Ionic Rare Earths Limited, Level 1, 34 Colin Street, West Perth WA 6005 Australia T+61 3 9776 3434 E admin@ionicre.com

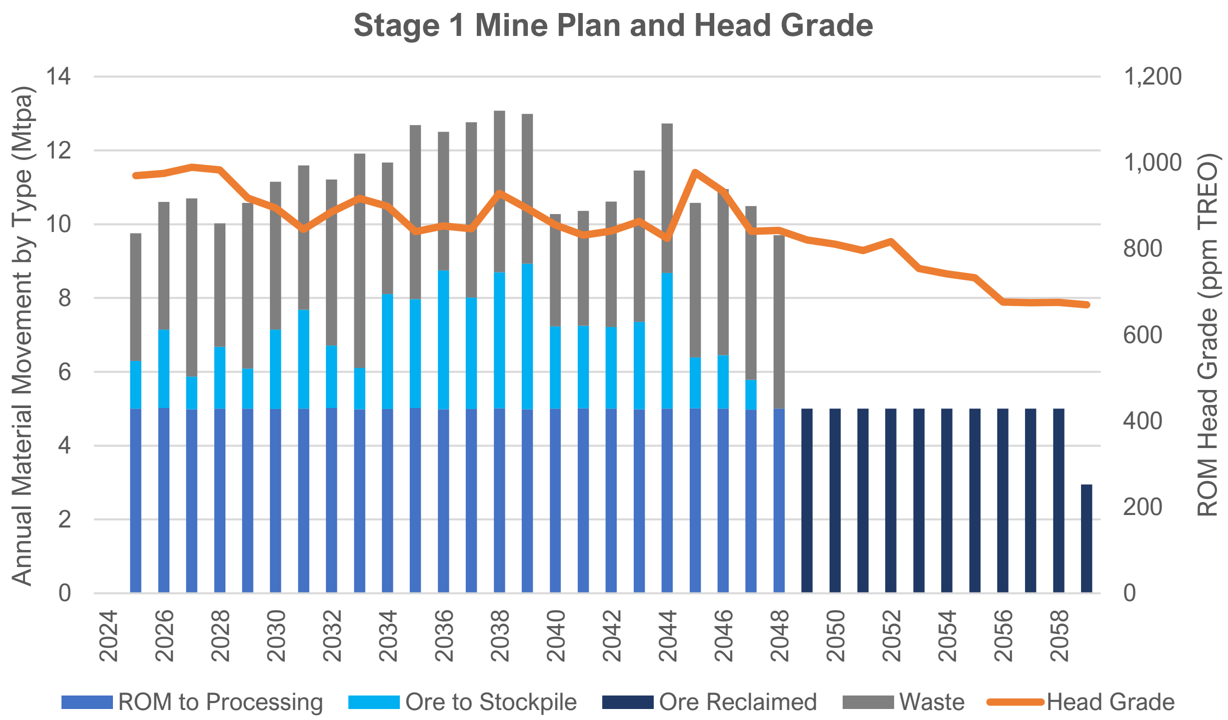


Figure 4: Makuutu Stage 1 DFS annual material movement mine plan, by type, and ROM TREO Head Grade processed.

Mining costs were estimated based on the physical mining movements and estimated US$1.80/tonne (wet) mined for mining optimisations assuming mining equipment and personnel provided by a local Ugandan operator, allowances for operational/technical personnel and grade control drilling costs each year.

The pit inventory, limiting the orebody to that contained within RL1693, includes 172.9 Mt of ROM @ 848 ppm TREO over a 35-year mine-life. This includes 67.8 Mt of ROM for the first 10 years at 928 ppm (500 ppm TREO-CeO_2 cut-off). The total pit tonnage mined over the LOM is approximately 272 Mt including 98.8 Mt of waste and mineralised rock material with a very low strip ratio (waste : ROM) of 0.57.

A specific processing cut-off grade of 500 ppm TREO-CeO_2 cut-off was utilised for Base case pit scenario for the first 10 years, with the optimisations all run on a cash flow basis for Rare Earth Oxide equivalent revenue only. Beyond the initial 10 years a processing cut-off grade of 200ppm TREO-CeO_2 was applied. IonicRE completed numerous metallurgical studies on composite samples of mineralisation at Makuutu as previously announced to the ASX on 18 February 2020, 26 May 2020, and most recently 4 August 2020. These results together with indicative mining and processing costs and other cost inputs support the application of a marginal cut-off grade of 200 ppm TREO (excluding CeO_2). This cut-off is comparable to peer projects with similar mineralisation types and processing assumptions.

Metallurgical factors were applied to the block model.

Revenue factors were applied to the block model at a 70% MREC payability factor.

Ionic Rare Earths Limited, Level 1, 34 Colin Street, West Perth WA 6005 Australia T+61 3 9776 3434 E admin@ionicre.com

Metallurgical Test Work and Processing by Heap Desorption

Metallurgical test work has been completed upon Makuutu samples dating back to 2014. Given the nature of the mineralisation, metallurgical recovery will have a substantive impact on project viability. A complete review of historical test work results coupled with a baseline variability program for Makuutu (2019), and subsequent optimisation test work in 2020 has indicated substantial potential for improved metallurgical extraction at Makuutu using a slightly more acidic desorption / leach arrangement.

Further metallurgical test work conducted in 2021 and 2022 to support the DFS, including extensive variability test work to better define the metallurgical extraction parameters and extent of weathering, was completed to apply across the mineralisation within RL 1693. The breadth of the variability and heap desorption columns tested included the following;

- 527 variability interval desorption bottle rolls;
- 88 variability desorption column composite bottle rolls;
- Selection of targeted desorption bottle rolls and tests on validation composites completed at independent laboratories to validate results;
- 22 variability composite desorption columns (3m);
- 15 validation composite desorption columns (3m);
- Scale up heap desorption columns including 1m, 2m, 3m, 4m and 5m columns (see Figure 5); and
- Scale up columns at 6m underway at present.

The Stage 1 DFS assumes a dynamic heap desorption with a 3m stack height. Whilst data exists to suggest a stack height of 6m, or higher, is possible, the Project will look to validate this through the Demonstration Plant prior to adopting this as the Stage 1 Base Case. Agglomerates and 5m heap desorption column completed at ANSTO is shown in Figure 6.

Subsequent to the work defining metallurgical extraction parameters applied to desorb REE from the clay mineralisation, additional test work has been completed to quantify the downstream impacts, most notably the impact of more aggressive leach conditions at lower pH (higher acidity), resulting in excessive dissolution of impurity elements, notably aluminium (Al) and iron (Fe). As a result, pH conditions applied in the heap desorption was targeted at pH 2, reducing REE extractions, but importantly substantially reducing the dissolution of Al and Fe, and thereby reducing the reagent consumption required to precipitate out impurity elements to reach the target MREC composition (> 40% REE content).

Elevated Al presence in the desorption liquor also results in increased potential for REE precipitation losses in the impurity precipitation circuit. As a result of this, test work has defined that operating the heap desorption at pH 2 provides a fair trade off to maximise REE extraction while managing the impurity load reporting the pregnant leach solution (PLS).

The metallurgical test work consisting of bottle rolls, columns, plus nano-filtration (NF) and reverse osmosis (RO) testing, impurity precipitation, MREC precipitation and materials handling characterisation lead to the development of a Makuutu Project unique SysCAD® simulation model, which has been used to define the overall metallurgical recoveries applied to the Project. Validation test work and procedures to verify the model outputs that were produced from the simulation model combined together to form the basis for the process design and the Process Design Criteria (PDC). The process design is represented in Figure 7.

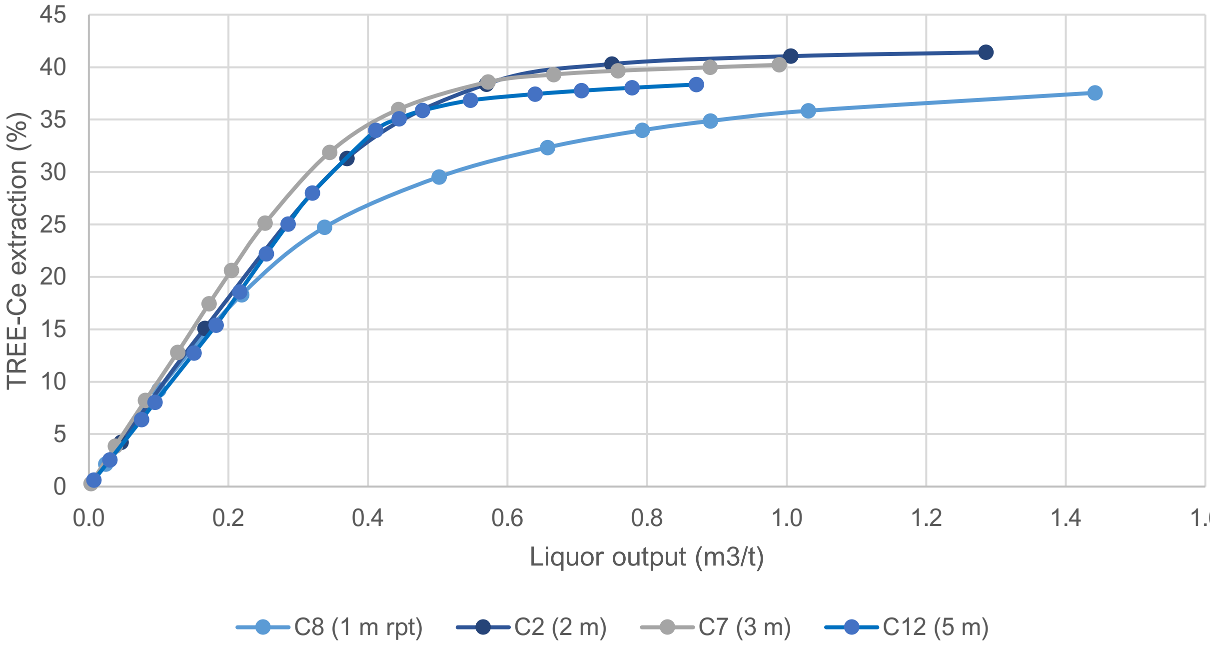


Figure 5: Heap desorption column scale up from 1m to 5m completed on a composite tested from RL 1693.

Figure 6: Agglomerates, post-curing, on the left, and a 5m heap desorption column under irrigation at ANSTO.

Ionic Rare Earths Limited, Level 1, 34 Colin Street, West Perth WA 6005 Australia T+61 3 9776 3434 E admin@ionicre.com

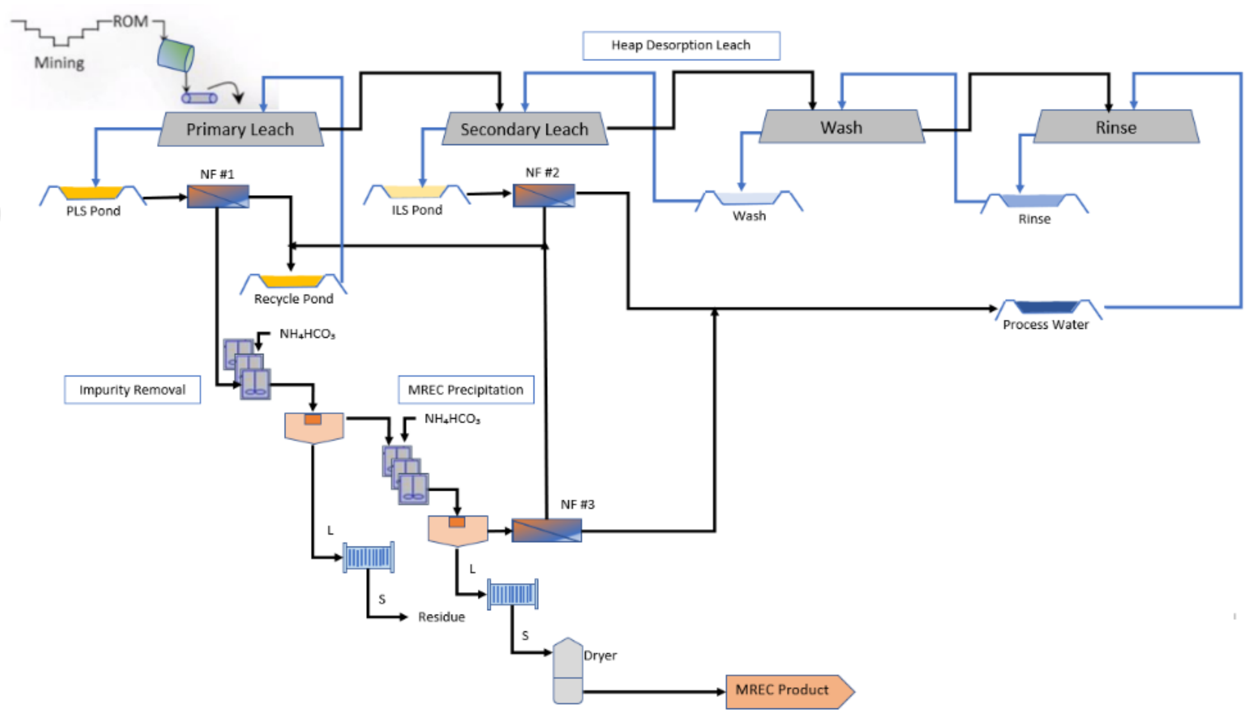


Figure 7: Makuutu Rare Earths Project Stage 1 DFS Process Flowsheet.

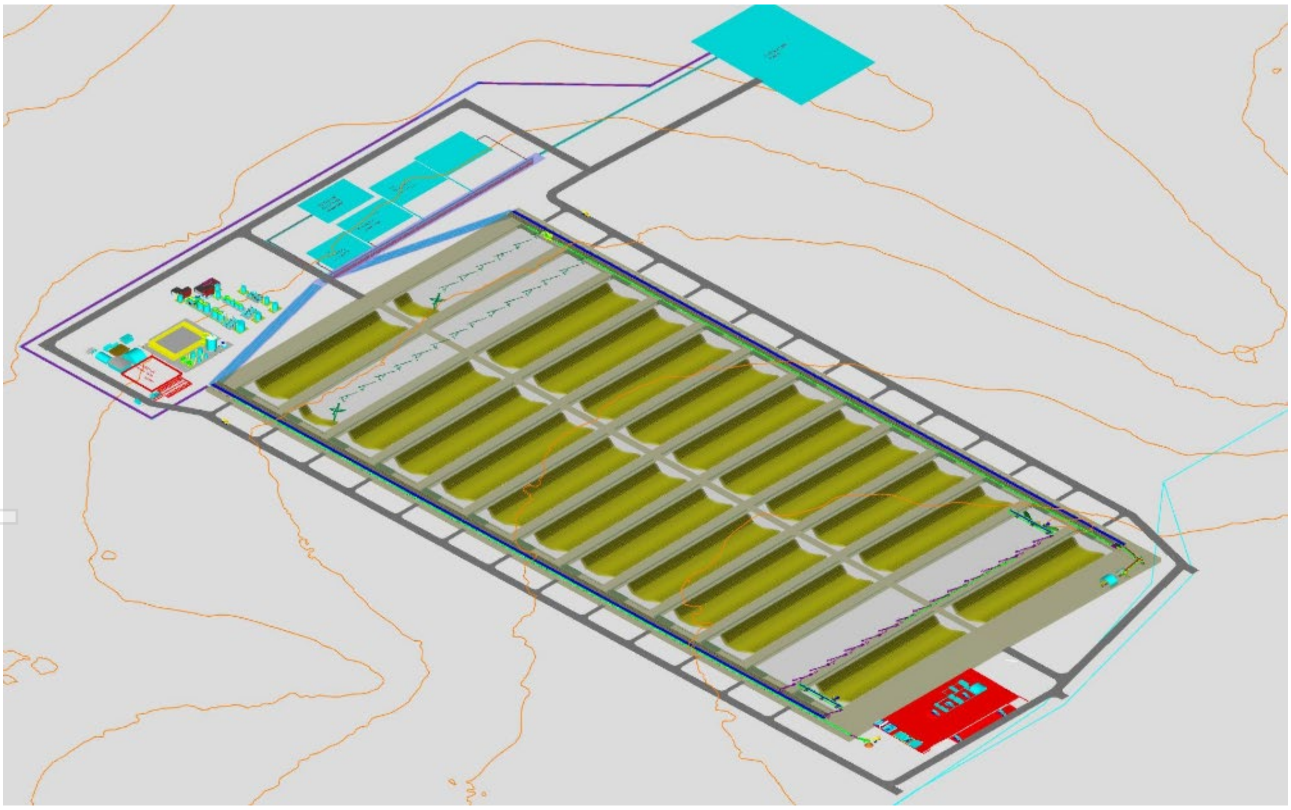


Figure 8: 3D model representation of the Stage 1 development at Makuutu.

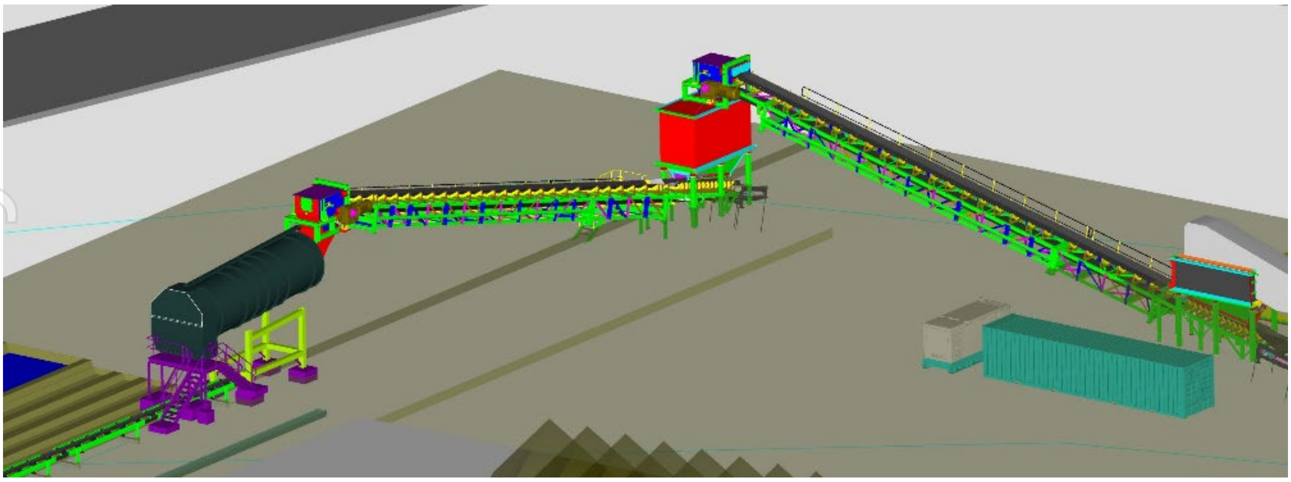


Figure 9: Ore Surge and agglomeration to feed Heap Desorption pads.

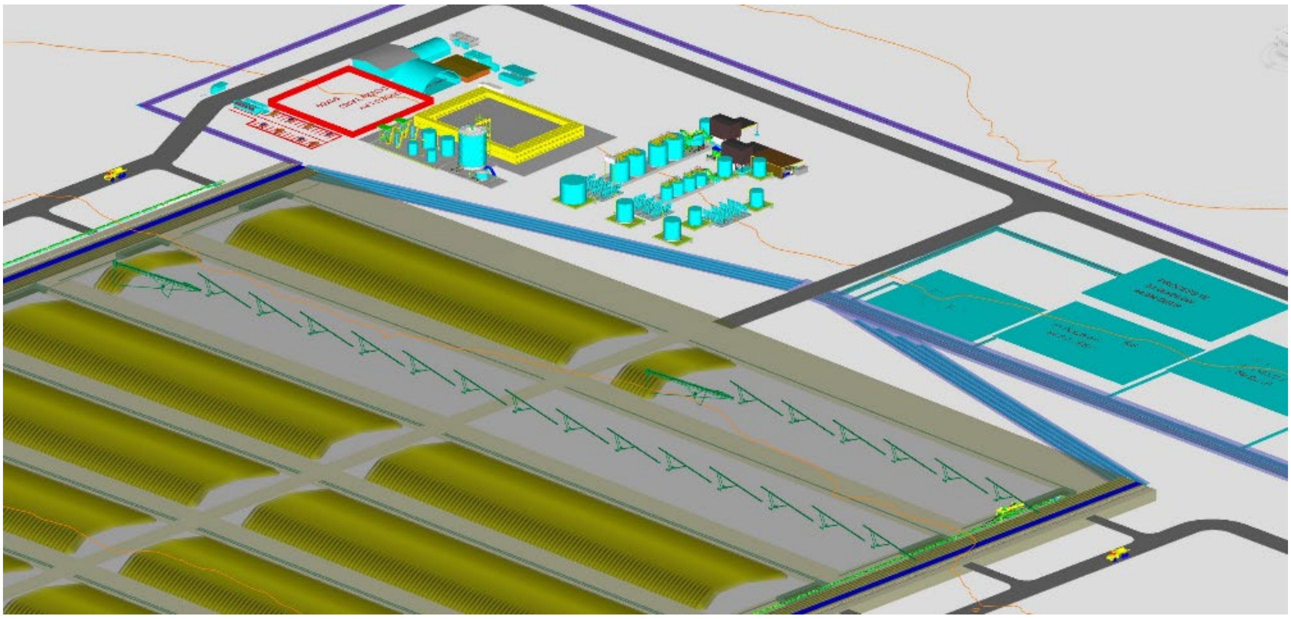


Figure 10: 3D model representation of the Heap Desorption pad stacking in the foreground, and precipitation circuit in the background.

Ionic Rare Earths Limited, Level 1, 34 Colin Street, West Perth WA 6005 Australia T+61 3 9776 3434 E admin@ionicre.com

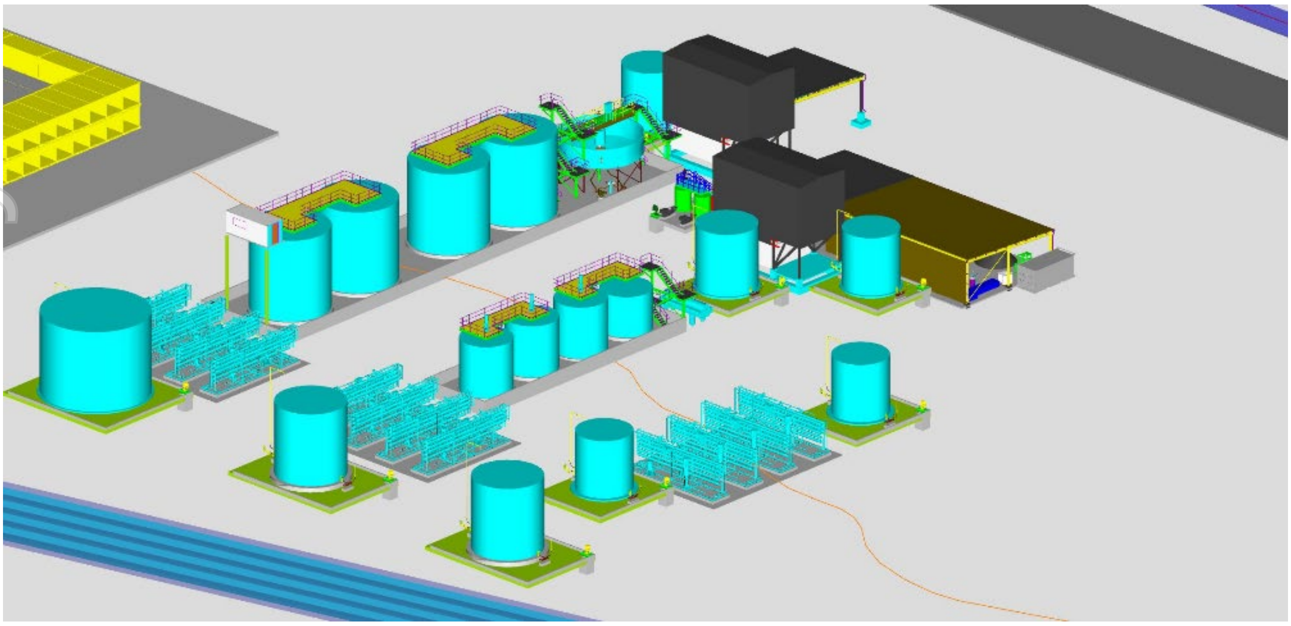


Figure 11: 3D model representation of the solution handling circuit, showing NF circuits in the foreground, and precipitation circuits and product handling in the background.

Based upon the results of the various test work programs, the overall recovery of ore to MREC product has been revised with a recovery trend provided in Figure 12. Also shown in Figure 12 is the total Stage 1 estimated production for each respective rare earth in oxide form.

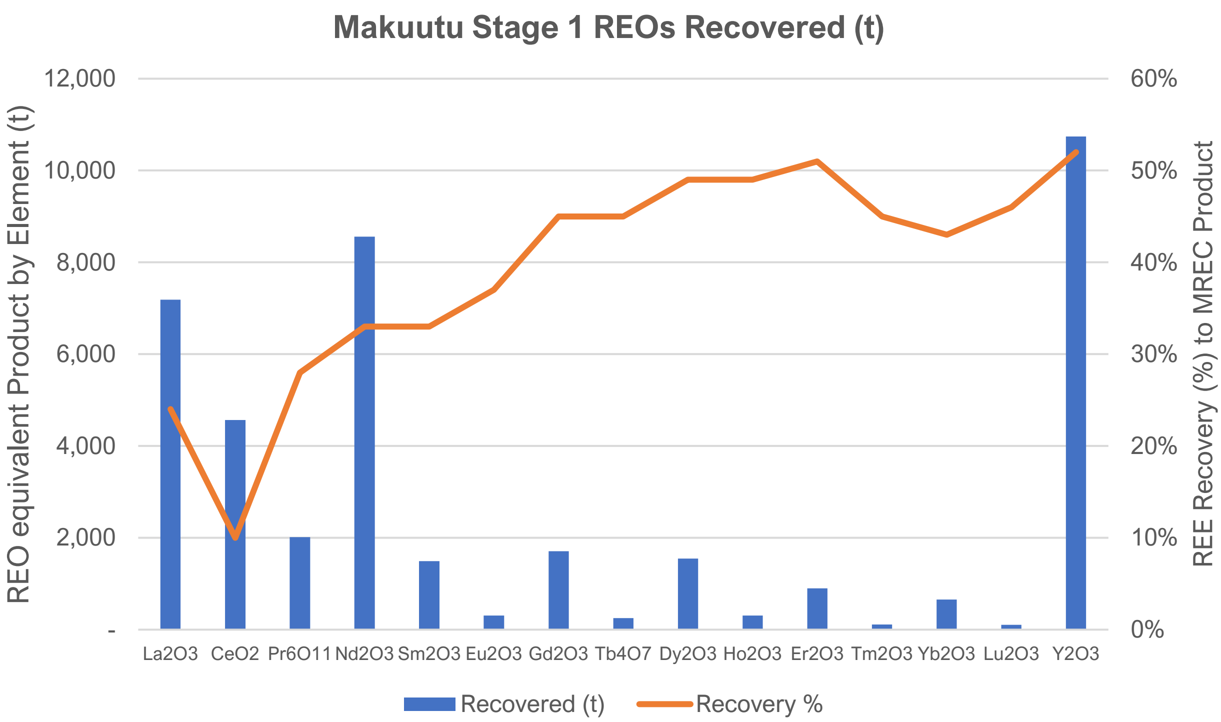


Figure 12: Makuutu elemental recovery and Stage 1 production to MREC (as REO equivalent) estimates.

A further breakdown is provided in Figure 13 on a year by year basis over the proposed Stage 1 development, and a revised Makuutu MREC product basket provided in Figure 14.

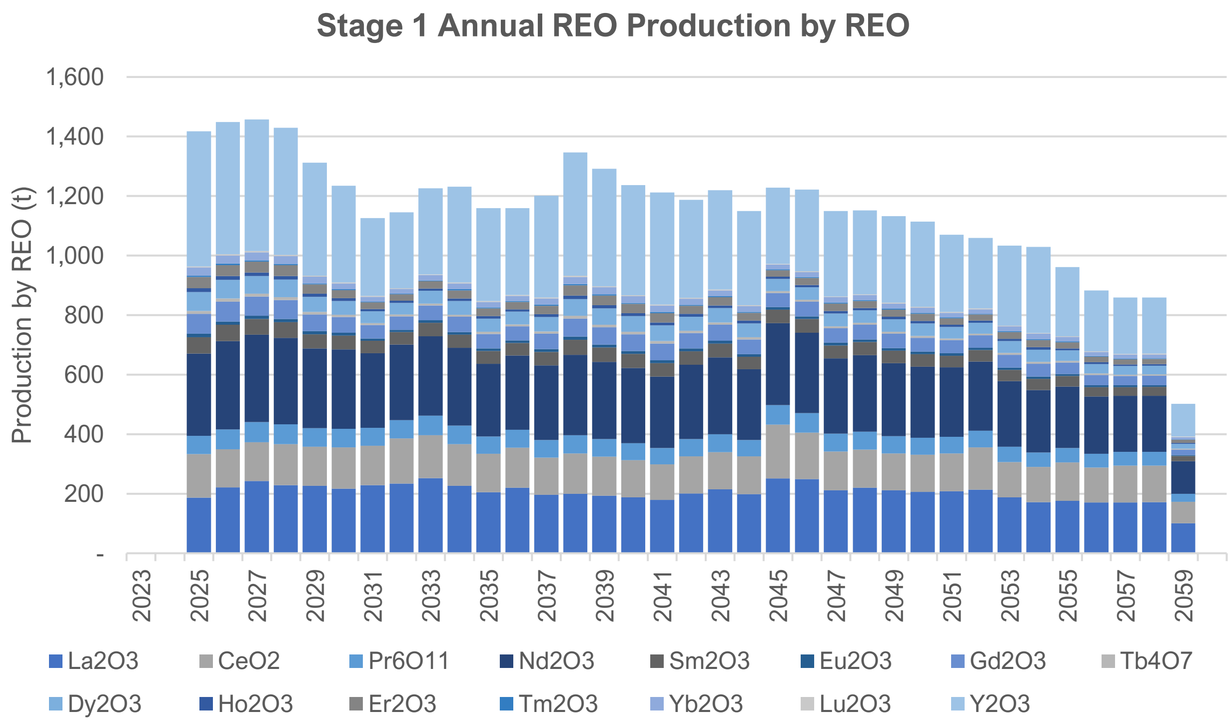


Figure 13: Makuutu Stage 1 DFS Production plan by REO for Years 1 to 35.

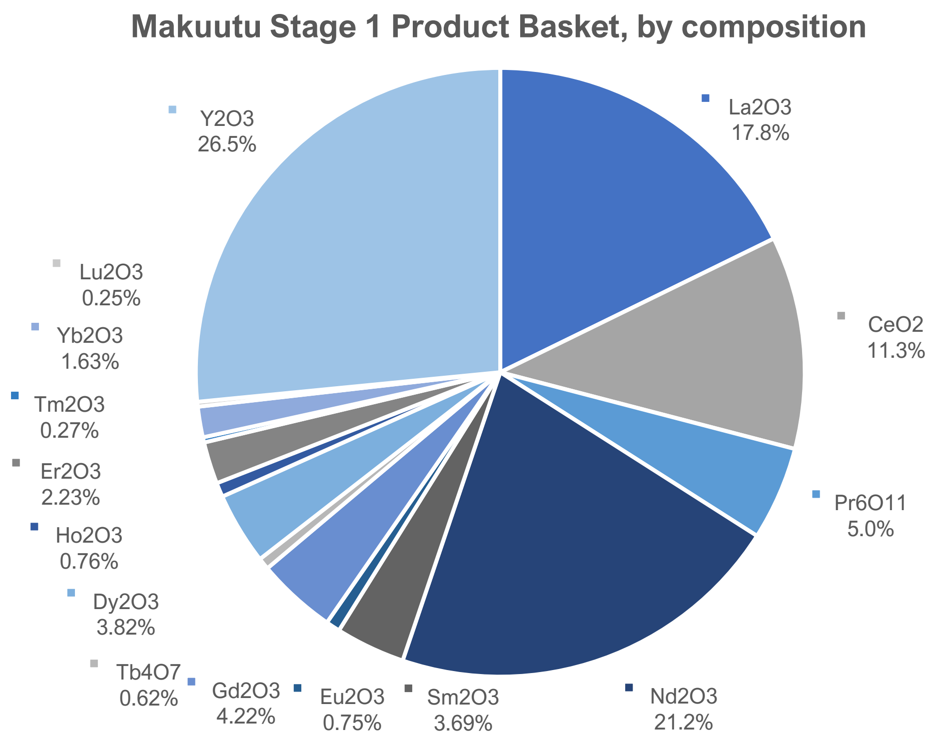


Figure 14: Makuutu Stage 1 REO product basket, excluding Sc_2O_3 (note rounding applied).

The updated Stage 1 basket has a 71% magnet plus heavy REO content, and breaking this down further;

- Magnet REO fraction (Nd, Pr, Dy and Tb) of approximately 31%;
- Additional magnetic fraction of approximately 9 % (Sm, Gd and Ho); and
- Heavy REO fraction of approximately 45%.

Basis for Product Revenue Assumptions

Pricing has been calculated based upon the data reported by independent research and advisory services group, Adamas Intelligence (Adamas) in September 2022. The individual REO pricing has been applied to the Makuutu basket composition to determine the annual basket pricing.

Table 6: Indicative Makuutu Rare Earth Oxide pricing forecast applied (Adamas Intelligence, September 2022).

REO		2025	2027	2029	2031	2033	2035
Base Case	**US$/kg**	$112.77	$109.41	$110.68	$122.36	$131.08	$138.53

Going forward, from 2022 through 2035 Adamas forecasts that global demand for NdFeB magnets will increase at a compound annual growth rate (CAGR) of 8.6%, bolstered by double-digit growth from electric vehicle and wind power sectors, translating to comparable demand growth for the rare earths elements, i.e., Neodymium (Nd), Praseodymium (Pr), Dysprosium (Dy) and Terbium (Tb), these magnets contain.

Over the same period, Adamas forecast that global production of Nd, Pr, Dy and Tb will collectively increase at a slower CAGR of just 5.4% as the supply side of the market increasingly struggles to keep up with rapidly growing demand.

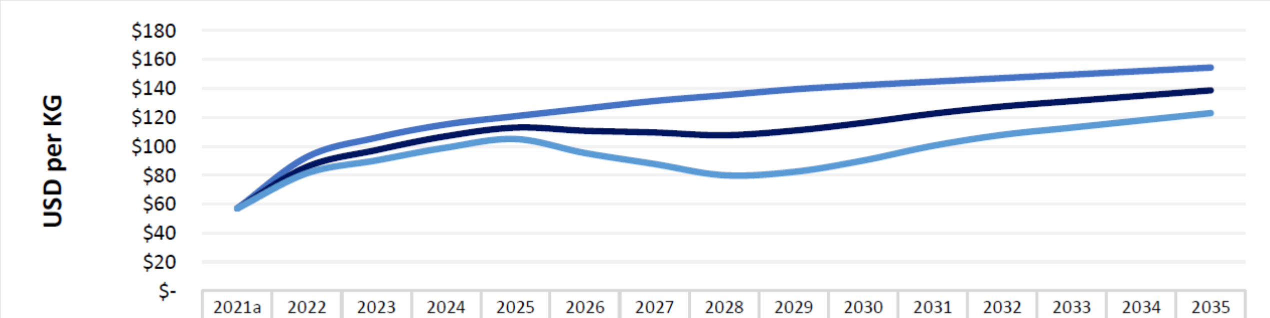
From 2023 through 2035, Adamas forecasts that the global rare earth industry will consistently underproduce Nd, Pr, Dy and Tb oxides (or oxide equivalents), resulting in the depletion of historically accumulated inventories and, ultimately, shortages of these critical magnet materials if supply is not increased beyond levels currently anticipated.

The Makuutu Rare Earths Project offers broad economic exposure to the rare earth permanent magnet sector, which is the fastest-growing end-use category and most in need of additional rare earth supplies, according to Adamas.

From a marketing, logistics and economic standpoint, the high proportion of valuable magnet- related rare earth elements in the Makuutu Project's prospective TREO production means that a future mine (with separation) could generate approximately 83% of its rare earths revenues from just 31% of its production volume (NdPr, Dy and Tb oxide).

Looking forward, Adamas believes that the current strong pricing environment for rare earth materials is here to stay, notwithstanding the market's usual ebbs and flows on the back of seasonality and other transient factors.

In its base case scenario (excluding Sc_2O_3), Adamas forecasts that the basket value of Makuutu TREO production will total US$106.83 per kg in 2024 and will increase to US$138.53 per kg in 2035. In its upside scenario (excluding Sc_2O_3), Adamas forecasts the basket value will total US$114.98 per kg in 2024 and will increase to US$154.27 per kg in 2035. In its downside scenario (excluding Sc_2O_3), Adamas forecasts the basket value will total US$98.94 per kg in 2024 and will increase to US$122.80 per kg in 2035. Refer to Figure 15 for the base case, upside case and downside case forecast from Adamas in September 2022.



	2021a	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Upside	$56.98	$92.45	$105.82	$114.98	$120.67	$125.97	$131.19	$135.15	$139.21	$142.07	$144.54	$146.96	$149.39	$151.83	$154.27
Base Case	$56.98	$85.67	$97.24	$106.83	$112.77	$110.60	$109.41	$107.52	$110.68	$116.04	$122.36	$127.35	$131.08	$134.80	$138.53
Downside	$56.98	$81.20	$90.13	$98.94	$104.87	$95.23	$87.63	$79.89	$82.16	$90.01	$100.18	$107.75	$112.76	$117.78	$122.80

* Basket values include 13% VAT; forecasted prices in Real 2022 dollars
* If selling into China VAT should be deducted; if selling ex-China above prices should be taken at face value
* Basket value excludes scandium oxide

Figure 15: Makuutu REO indicative basket pricing forecasts, excluding Sc_2O_3, using individual REO pricing forecasts for Base Case, Upside Case and Downside Case, provided by Adamas Intelligence (Sept 2022).

A scandium oxide (Sc_2O_3) price of US$775 per kg has been used for the study as forecasted by Adamas for production of less than 25 tpa.

Capital and Operating Costs

The capital cost estimate (CAPEX) has been developed to meet the requirements of an Association for the Advancement of Cost Engineering (AACE Class 3) estimate, targeting an accuracy of ±15%. The CAPEX estimate is broken down into the main areas of mining and processing plant. The mining capital cost estimate was developed by IonicRE with input from contract mining service providers in Uganda. The process plant capital cost estimate was developed by Mincore Pty Ltd (Mincore), located in Melbourne, Victoria, Australia.

To maintain high environmental standards at Makuutu, the process plant CAPEX includes a series (3) of nano-filtration (NF) circuits, each with a separate duty, and required to concentrate the REE and salt solutions enabling the recycling of water and ultimately the discharge of high-quality water from the site. The inclusion of NF technology is seen as a significant step change from historical IAC processing flowsheets operating in southern China, where illegal and unregulated mining of such deposits has resulted in considerable environmental damage.

Infrastructure costs include provision for access roads, haul roads, and water collection and management, which would need to be developed.

The CAPEX includes a provision for Owner's Costs, which includes more specific project related in country costs including an allocation for land acquisition and community programs.

Plant construction is expected to be 12 months.

The capital development profile for Makuutu reflects an initial project development with no planned expansion. Initial capital requirements of US$120.8 million in pre-production CAPEX including 10% contingency. The Capital Expenditure (CAPEX) estimate was developed from a bottom-up approach with majority of pricing received from the carrying out of procurement (check-price) packages and historical details of not more than 12 months from previous similar projects.

A breakdown of the CAPEX is provided in Table 7. A sustaining CAPEX allocation of US$19.3 million was estimated for the remaining operation of the Stage 1 development.

Table 7: Makuutu Stage 1 Development CAPEX.

Breakdown	Initial CAPEX (US$, Million)
Mining	$5.86
Process Plant	$67.4
Infrastructure	$10.7
Owners Cost	$24.7
Contingency	$12.1
Total, US$M	**$120.8**

The mining operating costs estimate (OPEX) was developed by IonicRE in consultation with a Ugandan based mining contractor and utilises their in-country knowledge on operational costs and servicing requirements for similar equipment to that nominated by RRM.

The operating model for the open pit mining is owner procured contract operated. RRM will provide management, technical services and other support services. RRM will provide the mechanical equipment and it is assumed that the contractor will be responsible for mobile equipment operation and service.

Process operating costs have been estimated with inputs provided by Mincore in collaboration with IonicRE. The estimated process operating costs were derived based upon an interim mass balance used for the study to estimate reagent consumption and consumables.

The general and administration (G&A) costs were determined by IonicRE.

The operating cost estimate was developed from a bottom-up approach. Makuutu Stage 1 OPEX (Mining, Process and G&A) is US$12.40 per t Ore (dry), US$52.99 per kg of REO.

A breakdown of Stage 1 OPEX is provided in Figure 16.

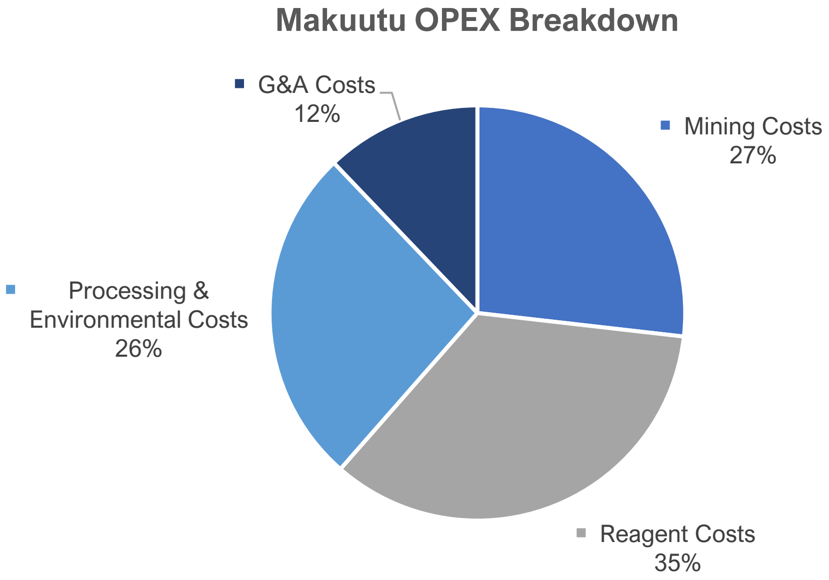


Figure 16: OPEX breakdown for Makuutu Stage 1.

Financial Modelling and Metrics

As part of the Makuutu Stage 1 DFS a Financial Model was developed, this contained many scenarios in an attempt to determine the sensitivities of the project. The economic analysis of the Makuutu Stage 1 development was completed by IonicRE, indicating the potential for an economic project, however several assumptions will require substantiation via additional work programs to be completed in the next phase of the Project. The Project NPV, with Scandium production assumed, using a discount rate of 8%, was pre-tax, US$406 million, and post-tax US$278 million, and an IRR of 32.7%. The payback period was determined at three (3) years from first production.

The Makuutu Stage 1 development will also be a significant contributor to Uganda's fiscus, with estimated gross royalty payments of US$199 million plus corporate tax contributions of US$438 million over the Stage 1 development of the Project, based upon RL1693 only at this stage.

All capital, operating and revenue inputs used in the DFS are on a US dollar basis.

A full breakdown of economic metrics is provided in Table 1.

The Project is most sensitive to mine grade, metallurgical recovery and REO pricing, with increases in these having substantial increments in the post-tax NPV of the Project. Operating cost has a larger effect on NPV compared to capital cost. The response of sensitivities tested is illustrated in Figure 17 and Figure 18.

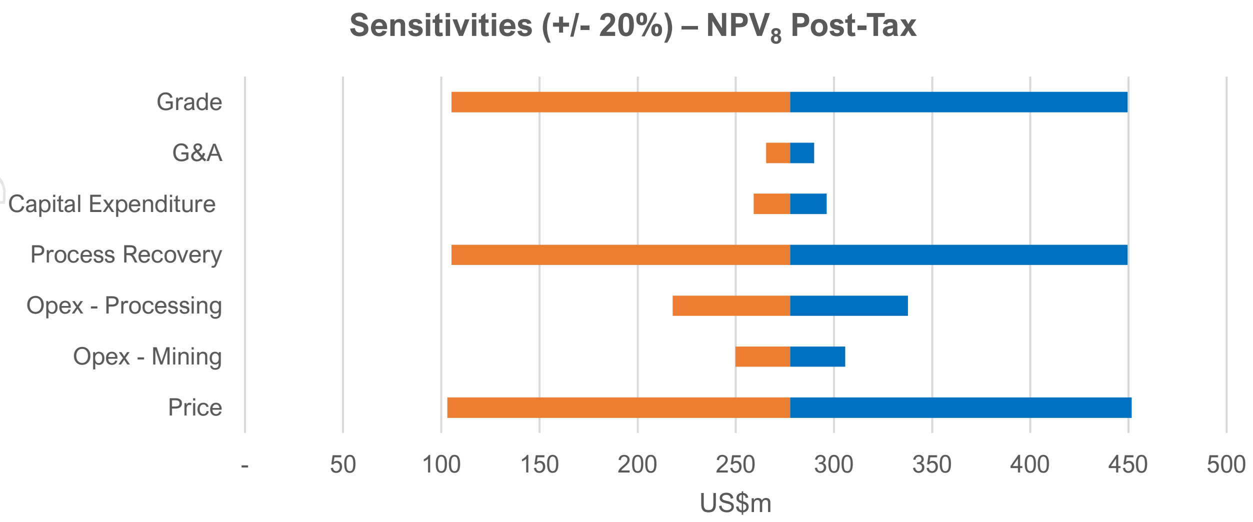


Figure 17: Makuutu Stage 1 DFS sensitivity analysis ±20%, post-tax NPV.

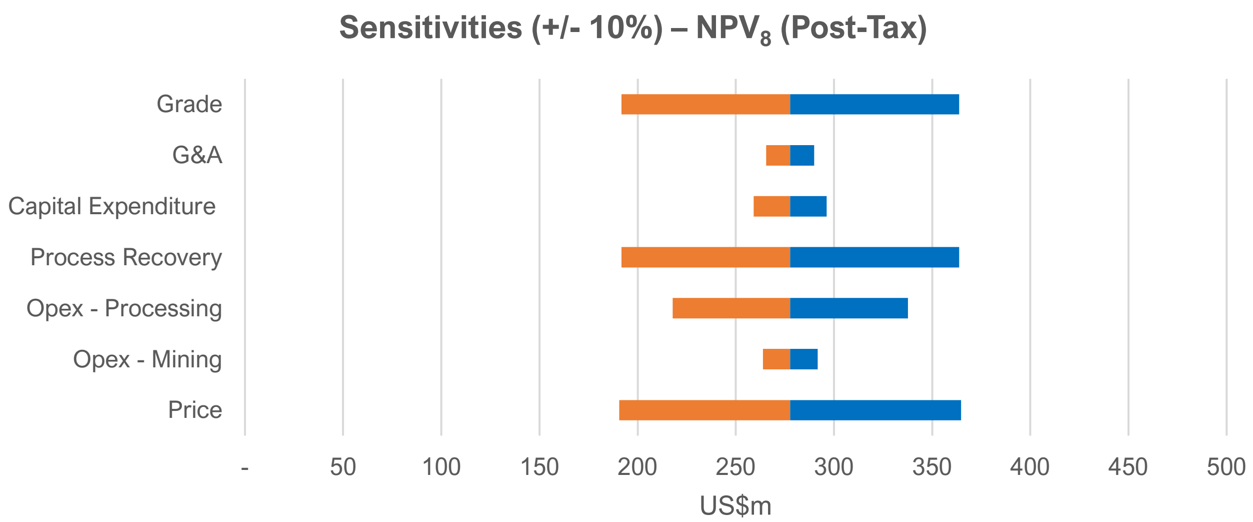


Figure 18: Makuutu Stage 1 DFS sensitivity analysis ±10%, post-tax NPV.

ESG and Land Ownership

The Project's ESG programs are documented in the Environmental and Social Impact Assessment (ESIA) which was approved by the Ugandan National Environmental Management Authority (NEMA), and with the permit awarded in October 2022 (see Figure 19).

The submitted development approach, which was approved by NEMA provides for a continuous rehabilitation of mined areas to ensure no footprint is left behind due to the mining operations, and the resulting rehabilitated agricultural land is more productive. The commitment to the local community, documented and approved by NEMA in the ESIA, outlined a prioritisation of employment for local stakeholders and engagement of local service providers, where available. This will form the basis of a long partnership with the local residents, Busoga Kingdom, and Ugandan Government. Makuutu aligns with Uganda's commitment to National Development Plan III (NDP-III).

Land Ownership is established through in the Land Access Agreements. RRM will partner with the Community, the Local Council, Kingdom and National Government to ensure the success of these agreements.

Figure 19: NEMA Executive presenting the Certificate of Approval for the Makuutu Rare Earth Project ESIA to the Rwenzori team in Uganda.

Next Steps

The positive outcomes generated by the DFS confirm the technical and economic viability of the Project. Next steps are to progress the Project towards the Final Investment Decision (FID) by the Board in late 2023, which will be supported by a positive outcome from the demonstration plant at Makuutu. Construction of the commercial plant is expected to commence in Q1 2024.

To achieve FID within the above timeframe, there are several key workstreams which need to be completed.

Demonstration Plant and Process Validation

The immediate next phase of the Project is to develop a Demonstration Plant at Makuutu to evaluate the scale up of mining, material handling and larger scale processing works onsite at Makuutu in Uganda. This has the benefits of further developing knowledge of the orebody, grade control optimisation processes, optimisation of desorption process conditions and control, evaluating logistics and material handling at larger scale, plus verifying the potential to increase the heap desorption stack height beyond 3m to unlock potential for greater capital efficiency.

Whilst heap desorption columns have demonstrated successful scale up to 5m and additional test work infers the potential to increase to 6m, and beyond, a larger program of variability columns, cribs and heap desorption test modules of approximately 5,000t will be required to confirm this as viable.

The Demonstration Plant will also be critical in producing substantial quantities of MREC product that will be required to progress potential supply chain partnerships, plus providing samples to support the next phase of development for IonicRE's potential downstream activities.

The Demonstration Plant and associated facility will also assist the Company in de-risking the Project through further capacity building in Uganda, training the geologists, metallurgists, mining specialists, project management and support staff – safety and environmental to ensure the ramp up of the Project in 2024 can be achieved.

Planning and works are well underway, with some initial equipment orders placed. Activity is set to increase during Q2 of 2023, with the construction of the facility shed, and delivery of the first 6m heap desorption columns.

Project Ownership

A key requirement on the financing of Makuutu Stage 1 will be to agree terms and finalise a transaction for IonicRE to secure a significant increase in the ownership of Makuutu beyond the earn-in target of 60% post DFS completion. Discussions have progressed well with partners within RRM, and the Company expects that a suitable transaction can be agreed in the near term to achieve this target now the Stage 1 DFS has been completed.

Product Offtake and Supply Chain Development

IonicRE has been actively engaging with potential supply chain partners, marketing to end users and intermediaries in the development of western supply chains over the past 18 months. These discussions have progressed well, and with the Makuutu Stage 1 DFS now complete, the Company expects to further progress engagement over the coming months with a view to also advancing potential refinery processing options suitable for receiving the Makuutu product in early 2025.

Several groups have indicated strong interest in working with IonicRE to bring the Makuutu basket into key western markets across the US, EU and UK, however the maturity of the downstream supply chain still requires significant investment, limiting the capacity for Makuutu to scale up at this time. IonicRE is continuing to work with these potential partners on a number of initiatives, which, at a smaller scale, are aligned to the Makuutu Stage 1 production profile.

To support the engagement and natural progression of several strategic partner discussions, now that the Stage 1 DFS has been completed and the award of the ML at Makuutu is pending, the Company will be appointing a Corporate Advisor to drive a formalised competitive process to progress strategic partnership and generate a positive outcome for the Company.

Project Financing

The Company has been in discussions with financiers regarding the potential funding of Makuutu Stage 1. Whilst a number of western government initiatives may be suitable to support favourable financing terms for Makuutu, greater clarity on supply chain partnerships will be crucial to secure the necessary milestones to secure Project debt finance.

To help facilitate the process, the Company will be looking to appoint an independent technical expert to review the outcomes of the DFS with a view to supporting the debt financing package for Makuutu. It is expected that this will occur post award of the ML for the Stage 1 development.

In addition, the Company is assessing other opportunities to raise the remaining equity required to build the Project, including involving a potential offtake/supply chain counterparty, streaming/royalty transactions or other strategic investors at corporate and Project level. To the extent the Company decides to undertake a capital raise to fund the Project this will dilute the interests of existing Shareholders.

The Company estimates that a total of US$48 million equity will be needed to finance the Project.

Land Access Agreements

The Company, via RRM, has initiated the next phase of land access agreements over the MLA at RL 1693, to agree a staged development at Makuutu with local landowners. Discussions and engagement with landowners are progressing well and we will update the market accordingly.

Detailed Front-End-Engineering and Design

While a substantial volume of work has been completed as part of the DFS, there is a further body of work required to finalise the overall plant design, including produce the final designs and detailed engineering to enable construction to commence as early as possible post FID. This work will be informed through initial workstreams from the Demonstration Plant and is expected to commence in Q3 2023.

Additionally, a number of opportunities have been flagged to value engineer the Study further, plus as well as exploring longer-term opportunities to reduce operational costs through development of local reagent capacity, which can support the staged development at Makuutu.

Mining Licence Application over RL 1693 (TN03834)

With the finalisation of the Makuutu Stage 1 DFS, IonicRE can now confirm all necessary documentation has been provided to the DGSM and Ugandan Mining Cadastre portal to support the MLA, which was initiated on 1 September 2022.

RRM are in regular contact with the DGSM, and the Company will update the market on progress of the MLA, now expected to be grant in the second quarter. This will not delay construction of the Demonstration Plant which is progressing.

Authorised for release by the Board.

For enquiries, contact:

Tim Harrison
Managing Director
Ionic Rare Earths Limited
investors@ionicre.com

Peter Taylor
NWR Communications
peter@nwrcommunications.com.au
+61 (0) 412 036 231

Competent Persons Statements

The information in this report that relates to Mineral Resources for the Makuutu Rare Earths deposit was first released to the ASX on 3 May 2022 and is available to view on www.asx.com.au. Ionic Rare Earths Limited confirms that it is not aware of any new information or data that materially affects information included in the relevant market announcement, and that all material assumptions and technical parameters underpinning the estimates in the announcement continue to apply and have not materially changed.

The information in this announcement that relates to mine design, planning and optimisation is based on information reviewed by Mr Lee White who is the Principal Engineer of Ionic Rare Earths Limited, engaged through a service contract with Kalem Group Pty Ltd and a shareholder of the Company. Mr White is also a Member of the AusIMM. Mr White has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined by the JORC Code 2012. Mr. White visited the Makuutu Site, Uganda on 23-31 August 2022. Mr White consents to the inclusion in this announcement of the matters based on their information in the form and context in which it appears.

The information in this document that relates to metallurgy test work and metallurgy simulation modelling is based on information reviewed by Dr Will Goodall who is the Principal Metallurgist (test work) and metallurgy simulation modelling, is based on information reviewed by Dr Will Goodall who is Principal Metallurgist (Simulation Modelling) and engaged through a service contract with Minassist Pty Ltd. Dr Goodall is a Member of the Australasian Institute of Mining and Metallurgy (AusIMM). Dr Goodall has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined by the JORC Code 2012. Dr Goodall is due to visit the Makuutu Site, Uganda, in the first half of 2023. Dr Goodall did visit the metallurgy test work laboratories during the test work phase of the Project in 2022. Dr Goodall consents to the inclusion in this announcement of the matters based on their information in the form and context in which it appears.

The information in this announcement and that relates to Capital Expenditure (CAPEX) is based on information reviewed by Mr Stephen McEwen who is Principal Mechanical Engineer of Ionic Rare Earths Limited, engaged through a service contract with SMC Pty Ltd and is a shareholder of the Company. Mr McEwen is a Member of the AusIMM. Mr McEwen has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined by the JORC Code 2012. Mr. McEwen last visited the Makuutu Site, Uganda, 23-31 August 2022. Mr McEwen consents to the inclusion in this announcement of the matters based on their information in the form and context in which it appears.

Forward Looking Statements

This announcement has been prepared by Ionic Rare Earths Limited and may include forward-looking statements. Forward-looking statements are only predictions and are subject to risks, uncertainties and assumptions which are outside the control of Ionic Rare Earths Limited. Actual values, results or events may be materially different to those expressed or implied in this document. Given these uncertainties, recipients are cautioned not to place reliance on forward looking statements. Any forward-looking statements in this document speak only at the date of issue of this document. Subject to any continuing obligations under applicable law and the ASX Listing Rules, Ionic Rare Earths Limited does not undertake any obligation to update or revise any information or any of the forward-looking statements in this document or any changes in events, conditions or circumstances on which any such forward looking statement is based.

Appendix 1: Makuutu Rare Earths Project 3 May 2022 Mineral Resource Estimate Tabulations

Table 8: Makuutu Rare Earth Resource Tabulation at 200ppm TREO- CeO_2 Cut-off Grade.

Resource Classification	Tonnes (millions)	La_2O_3 (ppm)	CeO_2 (ppm)	Pr_6O_{11} (ppm)	Nd_2O_3 (ppm)	Sm_2O_3 (ppm)	Eu_2O_3 (ppm)	Gd_2O_3 (ppm)	Tb_4O_7 (ppm)	Dy_2O_3 (ppm)	Ho_2O_3 (ppm)	Er_2O_3 (ppm)	Tm_2O_3 (ppm)	Yb_2O_3 (ppm)	Lu_2O_3 (ppm)	Y_2O_3 (ppm)
Indicated	404	130	220	30	110	20	4	20	3	10	3	10	1	10	1	100
Inferred	127	110	180	30	90	20	3	10	2	10	2	10	1	10	1	80
Total	**532**	**130**	**210**	**30**	**110**	**20**	**4**	**20**	**2**	**10**	**3**	**10**	**1**	**10**	**1**	**90**

Notes: Tonnes are dry tonnes rounded to the nearest 1Mt.
All material REO grades are rounded to the nearest 10 ppm except Eu_2O_3, Tb_4O_7, Ho_2O_3, Tm_2O_3, Lu_2O_3 which are immaterial to overall resource grade.

Table 9: Makuutu Rare Earth Project Resource Tabulation of REO Reporting Groups at 200ppm TREO- CeO_2 Cut-off Grade.

Resource Classification	Tonnes (millions)	TREO (ppm)	TREO- CeO_2 (ppm)	CREO (ppm)	HREO (ppm)	LREO (ppm)	NdPr (ppm)	Sc_2O_3 (ppm)	U_3O_8 (ppm)	ThO_2 (ppm)
Indicated	404	670	450	230	170	500	150	30	10	30
Inferred	127	540	360	180	140	400	120	30	10	30
Total	**532**	**640**	**430**	**220**	**160**	**480**	**140**	**30**	**10**	**30**

Notes: All ppm rounded from original estimate to the nearest 10 ppm which may lead to differences in averages from Table 8.
Y_2O_3 is included in the TREO, HREO and CREO calculation.
TREO (Total Rare Earth Oxide) = La_2O_3 + CeO_2 + Pr_6O_{11} + Nd_2O_3 + Sm_2O_3 + Eu_2O_3 + Gd_2O_3 + Tb_4O_7 + Dy_2O_3 + Ho_2O_3 + Er_2O_3 + Tm_2O_3 + Yb_2O_3 + Y_2O_3 + Lu_2O_3.
CREO[2] (Critical Rare Earth Oxide) = Nd_2O_3 + Eu_2O_3 + Tb_4O_7 + Dy_2O_3 + Y_2O_3
HREO (Heavy Rare Earth Oxide) = Sm_2O_3 + Eu_2O_3 + Gd_2O_3 + Tb_4O_7 + Dy_2O_3 + Ho_2O_3 + Er_2O_3 + Tm_2O_3 + Yb_2O_3, + Y_2O_3 + Lu_2O_3
LREO (Light Rare Earth Oxide) = La_2O_3 + CeO_2 + Pr_6O_{11} + Nd_2O_3
NdPr = Nd_2O_3 + Pr_6O_{11}
U_3O_8 and ThO_2 are deleterious elements being reported in accordance with JORC (2012) Guidelines.

[2] U.S. Department of Energy, Critical Materials Strategy, December 2011

Appendix 2: Makuutu Rare Earths Project Stage 1 Ore Reserve Estimate Tabulations – Areas C, Central Zone, Central Zone East and F Only.

Table 10: Makuutu Stage 1 Ore Reserve Estimate Tabulation.

Classification	Tonnes (millions)	La_2O_3 (ppm)	CeO_2 (ppm)	Pr_6O_{11} (ppm)	Nd_2O_3 (ppm)	Sm_2O_3 (ppm)	Eu_2O_3 (ppm)	Gd_2O_3 (ppm)	Tb_4O_7 (ppm)	Dy_2O_3 (ppm)	Ho_2O_3 (ppm)	Er_2O_3 (ppm)	Tm_2O_3 (ppm)	Yb_2O_3 (ppm)	Lu_2O_3 (ppm)	Y_2O_3 (ppm)
Proven	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Probable	172.9	173	264	42	150	26	5	22	3	18	4	10	1	9	1	119
Total	**172.9**	**173**	**264**	**42**	**150**	**26**	**5**	**22**	**3**	**18**	**4**	**10**	**1**	**9**	**1**	**119**

Table 11: Maiden Makuutu Stage 1 Ore Reserve Estimate.

Classification	Tonnage (Mt)	TREO Grade (ppm)	TREO-CeO_2 Grade (ppm)	NdPr (ppm)	DyTb (ppm)	LREO (ppm)	HREO (ppm)	CREO (ppm)	Sc_2O_3 (ppm)	U_3O_8 (ppm)	ThO_2 (ppm)
Proven	-	-	-	-	-	-	-	-	-	-	-
Probable	172.9	848	584	192	21	629	219	295	30	16	31
Total	**172.9**	**848**	**584**	**192**	**21**	**629**	**219**	**295**	**30**	**16**	**31**

Notes: All ppm rounded from original estimate to the nearest 10 ppm which may lead to differences in averages from Table 8.

Y_2O_3 is included in the TREO, HREO and CREO calculation.

TREO (Total Rare Earth Oxide) = $La_2O_3 + CeO_2 + Pr_6O_{11} + Nd_2O_3 + Sm_2O_3 + Eu_2O_3 + Gd_2O_3 + Tb_4O_7 + Dy_2O_3 + Ho_2O_3 + Er_2O_3 + Tm_2O_3 + Yb_2O_3 + Y_2O_3 + Lu_2O_3$.

CREO[3] (Critical Rare Earth Oxide) = $Nd_2O_3 + Eu_2O_3 + Tb_4O_7 + Dy_2O_3 + Y_2O_3$

HREO (Heavy Rare Earth Oxide) = $Sm_2O_3 + Eu_2O_3 + Gd_2O_3 + Tb_4O_7 + Dy_2O_3 + Ho_2O_3 + Er_2O_3 + Tm_2O_3 + Yb_2O_3$, + $Y_2O_3 + Lu_2O_3$

LREO (Light Rare Earth Oxide) = $La_2O_3 + CeO_2 + Pr_6O_{11} + Nd_2O_3$

NdPr = $Nd_2O_3 + Pr_6O_{11}$

DyTb = $Dy_2O_3 + Tb_4O_7$

U_3O_8 and ThO_2 are deleterious elements being reported in accordance with JORC (2012) Guidelines.

[3] U.S. Department of Energy, Critical Materials Strategy, December 2011

Appendix 3: Makuutu Rare Earths Project Stage 1 JORC Code, 2012 Edition – Table 1 Report.

Section 1 Sampling Techniques and Data

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

Criteria	JORC Code explanation	Commentary
Sampling techniques	• *Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.* • *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* • *Aspects of the determination of mineralisation that are Material to the Public Report.* • *In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.*	**Diamond Core Drilling** Drill core was collected from a core barrel and placed in appropriately marked core trays. Down hole core run depths were measured and marked with core blocks. Core was measured for core loss and core photography and geological logging completed. Sample lengths were determined by geological boundaries with a maximum sample length of 1 metre applied in clay zones and up to 2 metres in laterite zones where core recovery was occasionally low. Where the core contained continuous lengths of soft clay a carving knife was used to cut the core. When the core was too hard to knife cut it was cut using an electric core saw. Using either method core was initial cut in half then one half was further cut in half to give quarter core. Quarter core was submitted to ALS for chemical analysis using industry standard sample preparation and analytical techniques. Half core was collected for metallurgical test work.
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).*	**Diamond Core Drilling** Core size was HQ triple tube with a nominal diameter of 61.1mm. The core was not oriented (vertical holes)
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.* • *Measures taken to maximise sample recovery and ensure representative nature of the samples.* • *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.*	**Diamond Drilling** Core recovery was calculated by measuring actual core length versus drillers core run lengths. Core recovery ranged from 70% to 100% and averaged 97%. No relationship exists between core recovery and grade.
Logging	• *Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.*	All (100%) drill core has been geologically logged and core photographs taken. Logging is qualitative with description of colour, weathering status, alteration, regolith zone, major and minor rock types, texture, grain size and comments added where further observation is made.

<table>
<tr><th>Criteria</th><th>JORC Code explanation</th><th>Commentary</th></tr>
<tr><td></td><td>Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.
The total length and percentage of the relevant intersections logged.</td><td>Additional non-geological qualitative logging includes comments for sample recovery, humidity, and hardness for each logged interval.</td></tr>
<tr><td>Sub-sampling techniques and sample preparation</td><td>If core, whether cut or sawn and whether quarter, half or all core taken.
If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.
For all sample types, the nature, quality and appropriateness of the sample preparation technique.
Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.
Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.
Whether sample sizes are appropriate to the grain size of the material being sampled.</td><td>Diamond Drill Core
Where the core contained continuous lengths of soft clay a carving knife was used to cut the core. When the core was too hard to knife cut it was cut using an electric core saw.
Sample lengths were determined by geological boundaries with a maximum sample length of 1 metre applied in clay zones and up to 2 metres in laterite zones where core recovery was occasionally low.
Samples were collected from core trays by hand and placed in individually numbered bags. These bags were dispatched to ALS for analysis with no further field preparation.
Sample weights were recorded prior to sample dispatch. Sample mass is considered appropriate for the grain size of the material being sampled that is generally very fine grained and uniform.
Field duplicate sampling was conducted at a ratio of 1:25 samples. Duplicates were created by lengthways halving the ¼ core primary sample into 2 identical portions. Duplicate samples were allocated separate sample numbers and submitted with the same analytical batch as the primary sample.</td></tr>
<tr><td>Quality of assay data and laboratory tests</td><td>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.</td><td>Assay and Laboratory Procedures – All Samples
Samples were dispatched by air freight direct to ALS laboratory Perth Australia. The preparation and analysis protocol used is as follows:
<table>
<tr><th>ALS Code</th><th>Description</th></tr>
<tr><td>WEI-21</td><td>Received sample weight</td></tr>
<tr><td>LOG-22</td><td>Sample Login w/o Barcode</td></tr>
<tr><td>DRY-21</td><td>High temperature drying</td></tr>
<tr><td>CRU-21</td><td>Crush entire sample</td></tr>
<tr><td>CRU-31</td><td>Fine crushing – 70% <2mm</td></tr>
<tr><td>SPL-22Y</td><td>Split sample – Boyd Rotary Splitter</td></tr>
<tr><td>PUL-31h</td><td>Pulverise 750g to 85% passing 75 micron</td></tr>
<tr><td>CRU-QC</td><td>Crushing QC Test</td></tr>
<tr><td>PUL-QC</td><td>Pulverising QC test</td></tr>
</table>
The assay technique used for REE was Lithium Borate Fusion ICP-MS (ALS code ME-MS81). This is a recognised industry standard analysis technique for REE suite and associated elements. Elements analysed at ppm levels:
<table>
<tr><td>Ba</td><td>Ce</td><td>Cr</td><td>Cs</td><td>Dy</td><td>Er</td><td>Eu</td><td>Ga</td></tr>
<tr><td>Gd</td><td>Hf</td><td>Ho</td><td>La</td><td>Lu</td><td>Nb</td><td>Nd</td><td>Pr</td></tr>
<tr><td>Rb</td><td>Sm</td><td>Sn</td><td>Sr</td><td>Ta</td><td>Tb</td><td>Th</td><td>Tm</td></tr>
<tr><td>U</td><td>V</td><td>W</td><td>Y</td><td>Yb</td><td>Zr</td><td></td><td></td></tr>
</table></td></tr>
</table>

Criteria	JORC Code explanation	Commentary
		Analysis for scandium (Sc) was by Lithium Borate Fusion ICP-AES (ALS code Sc-ICP06). The sample preparation and assay techniques used are industry standard and provide a total analysis. All laboratories used are ISO 17025 accredited. **QAQC** Diamond Drill Core Samples • Analytical Standards CRM AMIS0275 and AMIS0276 and a specific Makuutu CRM MUIACREI01 were included in sample batches at a ratio of 1:25 to drill samples submitted. This is an acceptable ratio. The assay results for the standards were consistent with the certified levels of accuracy and precision and no bias is evident. • Blanks CRM blanks AMIS0681 and OREAS22e were included in sample batches at a ratio of 1:25 to drill samples submitted for analysis. This is an acceptable ratio. Both CRM blanks contain some REE, with elements critical elements Ce, Nd, Dy and Y present in small quantities. The analysis results were consistent with the certified values for the blanks. No laboratory contamination or bias is evident from these results. • Duplicates Field duplicate sampling was conducted at a ratio of 1:25 samples. Duplicates were created by lengthways halving the ¼ core primary sample into 2 identical portions. Duplicate samples were allocated separate sample numbers and submitted with the same analytical batch as the primary sample. Variability between duplicate results is considered acceptable and no sampling bias is evident. • Alternative Analysis Technique A selection of sample pulps was re-analysed at Bureau Veritas Minerals laboratory Perth W.A. using Laser Ablation MS technique. There is no evidence of systematic analytical bias or errors from these results.
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.*	No independent verification of significant intersection undertaken. No twinning of diamond core drill holes was undertaken. Sampling protocols for diamond core sampling and QAQC were documented and held on site by the responsible geologist. No procedures for data storage and management have been compiled as yet. Data were collected in the field by hand and entered into Excel spreadsheet. Data was compiled with assay results compiled and stored in Access database. Data verification is conducted on data entry including hole depths, sample intervals and sample numbers. Sample numbers from assay data are verified by algorithm in spreadsheet prior to entry into the database. Assay data was received in digital format from the laboratory and merged with the sampling data into an Excel spreadsheet format for QAQC analysis and reviewed against field data. Once finalised and validated data is stored in a protected Access database. Data validation of assay data and sampling data have been conducted to ensure data entry is correct. All assay data is received from the laboratory in element form is unadjusted for data entry.

Criteria	JORC Code explanation	Commentary
		Conversion of elemental analysis (REE) to stoichiometric oxide (REO) was undertaken by spreadsheet using defined conversion factors.(Source: https://www.jcu.edu.au/advanced-analytical-centre/services-and-resources/resources-and-extras/element-to-stoichiometric-oxide-conversion-factors)

Element ppm	Conversion Factor	Oxide Form
Ce	1.2284	CeO_2
Dy	1.1477	Dy_2O_3
Er	1.1435	Er_2O_3
Eu	1.1579	Eu_2O_3
Gd	1.1526	Gd_2O_3
Ho	1.1455	Ho_2O_3
La	1.1728	La_2O_3
Lu	1.1371	Lu_2O_3
Nd	1.1664	Nd_2O_3
Pr	1.2082	Pr_6O_{11}
Sm	1.1596	Sm_2O_3
Tb	1.1762	Tb_4O_7
Tm	1.1421	Tm_2O_3
Y	1.2699	Y_2O_3
Yb	1.1387	Yb_2O_3
Sc	1.5338	Sc_2O_3

Rare earth oxide is the industry accepted form for reporting rare earths. The following calculations are used for compiling REO into their reporting and evaluation groups:
Note that Y_2O_3 is included in the TREO, HREO and CREO calculation.
TREO (Total Rare Earth Oxide) = $La_2O_3 + CeO_2 + Pr_6O_{11} + Nd_2O_3 + Sm_2O_3 + Eu_2O_3 + Gd_2O_3 + Tb_4O_7 + Dy_2O_3 + Ho_2O_3 + Er_2O_3 + Tm_2O_3 + Yb_2O_3 + Y_2O_3 + Lu_2O_3$.
HREO (Heavy Rare Earth Oxide) = $Sm_2O_3 + Eu_2O_3 + Gd_2O_3 + Tb_4O_7 + Dy_2O_3 + Ho_2O_3 + Er_2O_3 + Tm_2O_3 + Yb_2O_3$, + $Y_2O_3 + Lu_2O_3$
CREO (Critical Rare Earth Oxide) = $Nd_2O_3 + Eu_2O_3 + Tb_4O_7 + Dy_2O_3 + Y_2O_3$
(From U.S. Department of Energy, Critical Materials Strategy, December 2011)
LREO (Light Rare Earth Oxide) = La_2O_3 + CeO2 + $Pr_6O_{11} + Nd_2O_3$
NdPr = $Nd_2O_3 + Pr_6O_{11}$
DyTb = $Dy_2O_3 + Tb_4O_7$

HREO% of TREO= HREO/TREO x 100
In elemental form the classifications are:
Note that Y is included in the TREE, HREE and CREE calculation.
TREE: La+Ce+Pr+Nd+Sm+Eu+Gd+Tb+Dy+Ho+Er+Tm+Yb+Lu+Y
HREE: Sm+Eu+Gd+Tb+Dy+Ho+Er+Tm+Yb+Y+Lu
CREE: Nd+Eu+Tb+Dy+Y
LREE: La+Ce+Pr+Nd

Criteria	JORC Code explanation	Commentary
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 for holes RRMDD001 to RRMDD711 were surveyed using a relational DGPS system. The general accuracy for x,y and z is ± 0.2m. Datum WGS84 Zone 36 North was used for location data collection and storage. This is the appropriate datum for the project area. No grid transformations were applied to the data. No downhole surveys were conducted. As all holes were vertical and shallow, the rig setup was checked using a spirit level for horizontal and vertical orientation Any deviation will be insignificant given the short lengths of the holes. Topography has been defined by creating a wireframe from drill hole collar locations
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.*	Drill spacing was optimised to suite grade estimation ranges as determined from variogram analysis of data distribution. 162 drill holes were spaced on a nominal 100m x 100m spacing within the MCZ. 517 holes in Areas C, E MCZ, MCZE, F, G, H and I were drilled on a 200m spacing. 32 drill holes in Areas A, B and D were drilled on a 400m spacing.
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.*	The Makuutu mineralisation is interpreted to be in a flat lying weathered profile including cover soil, lateritic caprock, clays transitioning to saprolite and saprock. Below the saprock are fresh shales, siltstones and mudstones. Pit mapping and diamond drilling indicate the mineralised regolith to be generally horizontal. All drill holes are vertical which is appropriate for horizontal bedding and regolith profile.
Sample security	• *The measures taken to ensure sample security.*	After collection, the samples were transported by Company representatives to Entebbe airport and dispatched via airfreight to Perth Australia. Samples were received by Australian customs authorities in Perth within 48 hours of dispatch and were still contained in the sealed shipment bags. Samples were subsequently transported from Australian customs to ALS Perth via road freight and inspected on arrival by a Company representative.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	No audits or reviews have been undertaken.

Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.*	The Makuutu Rare Earths Project is 100% owned by Rwenzori Rare Metals Limited ("RRM"), a Ugandan registered company. IonicRE currently has earned a 51% shareholding in RRM and may increase its shareholding to 60% by meeting further commitments as follows: 1. IonicRE to fund to completion of a Definitive Feasibility Study (DFS) to earn an additional 9% interest for a cumulative 60% interest in RRM.

Criteria	JORC Code explanation	Commentary
	• *The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.*	2. Milestone payments, payable in cash or IonicRE shares at the election of the Vendor, as follows: a. US$375,000 on production of 10 kg of mixed rare-earth product from pilot or demonstration plant activities; and b. US$375,000 on conversion of existing licences to mining licences. At any time should IonicRE not continue to invest in the project and project development ceases for at least two months RRM has the right to return the capital sunk by IonicRE and reclaim all interest earnt by IonicRE.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	Previous exploration includes: 1980: Country wide airborne geophysical survey identifying uranium anomalies in the Project area. 1990s: French BRGM and Ugandan DGSM undertook geochemical and geological survey over South-Eastern Uganda including the Project area. Anomalous Au, Zn, Cu, Sn, Nb and V identified. 2006-2009: Country wide high resolution airborne magnetic and radiometric survey identified U anomalism in the Project area. 2009: Finland GTK reprocessed radiometric data and refined the Project anomalies. 2011: Kweri Ltd undertook field verification of radiometric anomalies including scout sampling of existing community pits. Samples showed an enrichment of REE and Sc. 2011: The GTK conducted a ground gravity traverse which indicated a gravity low in the area. 2011: Kweri Ltd conducted ground radiometric survey and evaluated historic groundwater borehole logs. 2012: Kweri Ltd and Berkley Reef Ltd conducted prospect wide pit excavation and sampling of 48 pits and a ground gravity traverse. Pit samples showed enrichment of REE weathered profile. 2012 Kweri Ltd. Sent Five (5) samples to Toronto Aqueous Research Laboratory for REE leach test work. 2016 – 2017: Rwenzori Rare Metals conducted the excavation of 11 pits, ground gravity survey, RAB drilling (109 drill holes) and one (1) diamond drill hole. The historic exploration has been conducted to a professional standard and is appropriate for the exploration stage of the prospect.
Geology	• *Deposit type, geological setting and style of mineralisation.*	The Makuutu deposit is interpreted to be an ionic adsorption REE clay-type deposits similar to those in South China, Chile, Madagascar and Brazil. The mineralisation is contained within the tropical lateritic weathering profile of a basin filled with sedimentary rocks including shales, mudstones and sandstones potentially derived from the surrounding granitic and mafic rocks. These rocks are considered the original source of the REE which were then accumulated in the sediments (via ionic bonds with the clays) of the basin as the surrounding rocks have degraded. These sediments then form the protolith that was subjected to prolonged tropical weathering. The weathering developed a lateritic regolith with a surface indurated hardcap, followed downward by clay rich zones that grade down through saprolite and saprock to unweathered sediments. The thickness of the regolith is between 10 and 20 metres from surface. The REE mineralisation is concentrated in the weathered profile where it has dissolved from its primary mineral form, such as monazite and xenotime, then ionically bonded (adsorbed) or colloidally bonded on

Criteria	JORC Code explanation	Commentary
		to fine particles of aluminosilicate clays (e.g. kaolinite, illite, smectite). The adsorbed and colloidal REE is the target for extraction and production of REO at Makuutu.
Drill hole Information	• *A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:* ○ *easting and northing of the drill hole collar* ○ *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar* ○ *dip and azimuth of the hole* ○ *down hole length and interception depth* ○ *hole length.* • *If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.*	The material information for drill holes relating to this announcement are contained in Appendix 2.
Data aggregation methods	• *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.* • *Where aggregate intercepts incorporate short lengths of high-grade results and longer lengths of low-grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.* • *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	No metal equivalents values are used.
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').*	Down hole lengths, true widths are not known. The mineralisation is interpreted to be horizontal, flat lying sediments and weathering profile, with the vertical drilling perpendicular to mineralisation. Any internal variations to REE distribution within the horizontal layering was not defined, therefore the true width is considered not known.
Diagrams	• *Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	Refer to diagrams in body of text.
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.*	This report contains all drilling results that are consistent with the JORC guidelines. Where data may have been excluded, it is considered not material.

Criteria	JORC Code explanation	Commentary
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.*	Metallurgical leach testing was previously conducted on samples derived from exploration pits, RAB drilling, and one 8.5 tonne bulk pit sample. In 2012, 5 pit samples were sent to the Toronto Aqueous Research Laboratory at the University of Toronto for leachability tests. In 2017, 2 pit samples were sent to SGS Laboratory Toronto for leachability tests. 2017/18, 29 samples were collected from 7 RAB drill holes. 20 of these were consigned to SGS Canada and 4 to Aqueous Process Research (APR) in Ontario Canada. The remaining 5 samples were consigned to Bio Lantanidos in Chile. 2018/19, 8.5 tonne bulk sample was consigned to Mintek, South Africa, to evaluate using Resin-in-leach (RIL) technology for the recovery of REE. 2019: 118 samples from 31 holes from the 2019 diamond drilling program had preliminary variation test work conducted TREE-Ce extraction ranged from 3% to 75%. 2020: Testing of composite samples with lower extractions from the 2019 variation testing using increasing rates of acid addition and leach time. Significant increases in extractions were achieved. 2020: Testing of composited samples from two exploration holes east of the Makuutu Central Zone provided an average extraction of TREE-Ce recovery of 41% @ pH1 Testing of samples from the project is ongoing.
Further work	• *The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).* • *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	Future work programs to be determined.

Section 3 Estimation and Reporting of Mineral Resources

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

Criteria	JORC Code explanation	Commentary
Database integrity	• *Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.* • *Data validation procedures used.*	Data collected in the field has been validated against core photography and original data collection files. Analytical data is received in digital format from the laboratory and merged with the sampling data into an Excel spreadsheet format for QAQC analysis and review against field data. Once finalised and validated data is stored in a protected Access database. Data validation of original sampling and assay data have been conducted on the database on a 1:10 entries spot check basis. Data has also been correlated against interval lengths and EOH details. Any data entry errors identified have been corrected in the database.
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.* • *If no site visits have been undertaken indicate why this is the case.*	The project site has been visited by the Competent Person for Exploration Results who has observed drilling operations, reviewed drill core, and reviewed sampling and QAQC procedures. The project has been visited by the Competent Person responsible for the reporting of Mineral Resources who reviewed the field project area, drill core, sampling and bulk density procedures.

Criteria	JORC Code explanation	Commentary
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.*	The mineral deposit is hosted in a tropical laterite regolith profile derived from generally flat lying sediments. The regolith commences from surface to an average depth of approximately 18 metres. All drilling was geologically logged in the field including rock type and degree of weathering. Following field data collection and receipt of analytical data the deposit has been categorised on a Regolith Zone basis based on visual observation from drill core and multi-element ratio analysis. There is a moderate to high degree of confidence in the interpretation of the regolith units given the flat lying and reasonably consistent nature of the regolith. There is unlikely to be any significant structural disruption to the mineralisation through the resource area. Estimation domains were based on grouping of the regolith domains into five zones as defined by regolith rheology, and by comparison of regolith statistics: • Domain 1,2,3 – Cover zone • Domain 4 – Mottled zone • Domain 5 – Clay zone • Domain 6 – Upper Saprolite zone • Domain 7 – Lower Saprolite zone • Domain 8,9 – Basement zone
Dimensions	• *The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.*	The overall defined mineralised zone extends across 11 discrete prospect areas defined by radiometric and topographical features. The overall strike for the eastern-most to western-most prospects is approximately 37 kilometres, with an across strike extent of ~3,000m and an average vertical thickness of 18m. The top of the mineralised zone is defined by a thin surficial soil / hardcap zone that averages 3.5m in thickness. The base of the mineralised zone is defined by the top of the saprock/fresh rock boundary which extends to an average vertical depth of 17m.
Estimation and modelling techniques	• *The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.* • *The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.* • *The assumptions made regarding recovery of by-products.* • *Estimation of deleterious elements or other non-grade variables of economic significance (eg sulphur for acid mine drainage characterisation).* • *In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.* • *Any assumptions behind modelling of selective mining units.*	A total of 15 rare earth element (REE) grade attributes (Y, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu) and Sc, and 2 deleterious elements (U, and Th) were estimated. Additionally, bulk density was estimated for those domains with sufficient numbers of measurements. Final estimated values are converted to stoichiometric oxide values by calculation using published ratios to support reporting of rare earth oxides (REO). The grade estimation used the Ordinary Kriging ("OK") technique together with dynamic anisotropy to guide the grade interpolation parallel to the regolith boundaries. Grade interpolation used 1m composited samples constrained by the estimation domain boundaries which were either treated as hard or soft boundaries based on statistical boundary analysis. An appropriate top cutting strategy (generally above the 99th grade percentile) was used to minimise the influence of isolated high-grade outliers. Interpolation parameters were derived using standard exploratory data analysis techniques of statistical and continuity analysis. Appropriate interpolation strategies were developed on a domain basis using kriging neighbourhood analysis ("KNA"), which included: • Oriented ellipsoidal search radii ranged from 600m to 1500m depending on the estimation domain;

Criteria	JORC Code explanation	Commentary
	• *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.*	• Minimum number of samples = 8; • Maximum number of samples = 20, and • Octant search with a maximum of 5 samples per octant. The maximum extrapolation distance from the last data points was no more than 200m. Computer software used for the modelling and estimation were: • Leapfrog Geo v2021 was used for geological domain modelling. • Supervisor v8.14 was used for geostatistical analysis. • Maptek Vulcan 2022 was used for grade estimation, block modelling and reporting. The estimation block model definitions are: • Non-rotated block model with an azimuth of 000ºGN; • OK panel size was set at 100m x 100m x 2m (XYZ): o A smaller parent cell size of 50m x 50m x 2m (XYZ) was used in the Central Main prospect where drilling was completed to 100m x 100m on average. • Sub-block size of 25m x 25m x 1m (XYZ); • The bulk of the drilling data is on 200m by 200m grid spacings with a portion of the Central Main prospect infilled to 100m spacing, and • Appropriate search ellipses were derived from KNA with an average search radii of 600m to 1500m and average anisotropy of 30:20:1 (major/semi/minor). Selection of the block size was based on the geometry of the mineralisation, data density, and the likely degree to which selective mining can be successfully applied to the geologically based domain boundaries. Estimations of U and Th elements were completed for the Mineral Resource estimate. Estimates of Sc were also completed. No other deleterious elements or other non-grade variables of economic significance are reported. Correlations between the elements were determined from statistical analysis of the REE and demonstrated strong positive correlations between the majority of REE variables, particularly for the heavy rare earth elements in the primary mineralised domains (domains 4, 5, 6 and 7). The estimation model was validated using the following techniques: • Visual 3D checking and comparison of informing samples and estimated values; • Global statistical comparisons of raw sample and composite grades to the block grades; • Comparison of correlation coefficients between composite and block data; • Validation 'swath' plots by northing, easting and elevation for each domain, and • Analysis of the grade tonnage distribution. No by-product recoveries were considered. No mining production has taken place at the deposit.
Moisture	• *Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	Tonnes are estimated on an In situ Dry Bulk Density basis. No moisture content has been determined by test work or used in estimation.
Cut-off parameters	• *The basis of the adopted cut-off grade(s) or quality parameters applied.*	Ionic Rare Earths Ltd have completed numerous metallurgical studies on composite samples of mineralisation at Makuutu as previously announced to the ASX on 18 February 2020, 26 May 2020, and

Criteria	JORC Code explanation	Commentary
		most recently 4 August 2020. These results together with indicative mining and processing costs and other cost inputs supports application of a marginal cut-off grade of 200 ppm TREO (excluding CeO_2). This cut-off is comparable to peer projects with similar mineralisation types and processing assumptions.
Mining factors or assumptions	• *Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.*	Mineralisation is near surface, broadly flat lying, and of grades amenable to conventional open pit mining methods. The assumed mining method would be 'free dig' using truck and shovel.
Metallurgical factors or assumptions	• *The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.*	Processing of the REE mineralisation is considered relatively simple, with the clay undergoing a desorption process in which the REE are desorbed from the mineralisation into a salt solution, concentrated, and precipitated to create a mixed rare earth product. Preliminary metallurgical test work has been completed on core samples from the project area (ASX Releases 18 February 2020, 26 May 2020, 4 August 2020). This reports metallurgical recoveries up to 75% TREE minus Cerium using simple extraction techniques. These recoveries compare favourably to other known ionic clay hosted rare earth projects.
Environmental factors or assumptions	• *Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.*	Tailings (the processed clay) are expected to be returned to the mined open pits and areas progressively rehabilitated.
Bulk density	• *Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.* • *The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and alteration zones within the deposit.*	Bulk density has been determined from 1,223 individual drill core measurements using Archimedes method. Samples were oven dried, weighed, coated with wax then weighed dry and in water using an appropriate analytical balance. Bulk densities for the primary mineralised domains (domain 4, 5, 6 and 7) were estimated using an omnidirectional variogram with soft boundaries following boundary analysis. Densities for the remaining regolith zones were by direct assignment based on reported measurements.

Criteria	JORC Code explanation	Commentary
	• *Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.*	
Classification	• *The basis for the classification of the Mineral Resources into varying confidence categories.* • *Whether appropriate account has been taken of all relevant factors (ie relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).* • *Whether the result appropriately reflects the Competent Person's view of the deposit.*	Classification of the mineral resource considered the interpretation confidence, drilling density, demonstrated continuity, estimation statistics (conditional bias, kriging efficiency) and block model validation results. The Makuutu Mineral Resource has been classified into Indicated (76%) and Inferred (24%) categories. The assigned Mineral Resource classification reflects the Competent Person's view of the deposit.
Audits or reviews	• *The results of any audits or reviews of Mineral Resource estimates.*	No audits or review have been completed for the Mineral Resource Estimate.
Discussion of relative accuracy/ confidence	• *Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.* • *The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.* • *These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	The relative accuracy of the Mineral Resource estimate is reflected in the reporting of the Mineral Resource as per the guidelines of the 2012 JORC Code. The statement relates to the global estimates of tonnes and grades. No production data is available.

Section 4 Estimation and Reporting of Ore Reserves

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

Criteria	JORC Code explanation	Commentary
Mineral Resource estimate for	• *Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.* • *Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.*	• The Mineral Resource estimate methodology is described in Sections 2 of this JORC Table 1The Mineral Resource for the Ionic Rare Earths Makuutu Project was completed in April 2022 and released by Ionic Rare Earths Ltd on the ASX 3 May 2022 "Substantial Increase To Makuutu Resource To Over 500 Million Tonnes".

Criteria	JORC Code explanation	Commentary
conversion to Ore Reserves		• The Mineral Resource contains Indicated and Inferred classifications but only the Indicated Mineral Resource was used to generate the Ore Reserves. • The Mineral Resource was reported using a cut-off grade of 200 parts per million (ppm) TREO minus CeO_2 (TREO-CeO_2) was used to generate the 2023 Ore Reserves. • The Mineral Resources reported are inclusive of the Ore Reserves for the Project.
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.* • *If no site visits have been undertaken indicate why this is the case.*	• The Competent Persons for the estimation and reporting of Ore Reserves are: Stephen McEwen (Study Manager), Dr Will Goodall (Principal Metallurgist) and Mr Lee White (Principal Mining Engineer). The information in this report relating to metallurgical test work results, metallurgical modelling and metallurgical recoveries applied for calculation of Ore Reserves is based on information compiled by Dr Goodall. The information in this report relating to Capital and Operating Cost Estimations and Engineering Study is based on information compiled by Mr McEwen. Mr. McEwen is engaged as an internal consultant to Ionic Rare Earths Limited and is a Member of the Australian Institute of Mining and Metallurgy (AusIMM). • Mr White is an employee of Kalem Group Pty Ltd, a Member of the Australian Institute of Mining and Metallurgy (AusIMM) and engaged as an internal consultant to Ionic Rare Earths Limited. Mr White conducted a site visit in August 2022. • Dr Goodall is an employee of MinAssist Pty Ltd, a Member of the Australian Institute of Mining and Metallurgy (AusIMM) and engaged as a consultant to Ionic Rare Earths Limited. Dr Goodall has not yet visited site but has attended the ANSTO heap column desorption test works and reviewed other metallurgical test work programmes. • Mr McEwen has made numerous extended visits to site during 2022.
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 Ore Reserves. Such studies will have been carried out and will have determined a mine plan that is technically achievable and economically viable, and that material Modifying Factors have been considered.*	• In March 2023, Ionic Rare Earths completed a Definitive Feasibility Study (DFS) prepared by Mincore Pty Ltd, Ionic Rare Earths Ltd employees and other internal and external consultants. • The project consists of mining and processing of 5 Mtpa of rare earth ore containing ionic adsorption clay (IAC) deposits in Uganda. The mineralisation is processed via simple heap leach desorption of the IAC ore using a salt desorption to produce a mixed rare earth carbonate (MREC) intermediate product that is the filtered, dried and bagged for sale to downstream REE separation and refining. The product will be a MREC, a chemical precipitate with a nominal REO content exceeding 90% REO grade. The leach residues will be reclaimed from spent heap leach stockpiles and rehabilitated back into open cut pit voids. • The project development consists of an open cut operation, hydrometallurgical processing plant and associated infrastructure, including: ○ Haul Truck Site Roads ○ Agglomerator. ○ Materials Handling. ○ Heap Desorption Leach pads and ponds. ○ Impurity Removal, thickener, filter, materials handling, rehabilitation. ○ MREC Precipitation, thickener, filter, drying and bagging of product for transport. ○ Membrane (Nano-filtration) water treatments circuits. ○ Reagent storage and mixing facilities. ○ Services:

Criteria	JORC Code explanation	Commentary
		▪ Potable water; (pumping and piping only); ▪ Process water (pumping and piping only); ▪ Fire water (stand-alone system, pumping and piping); ▪ Air (compressed process and instrument air, low pressure blower air); and ▪ Sewage (system, reticulation and collection). o Plant facilities. o Central control room and ablutions o Plant buildings: ▪ Process offices, first aid and emergency services building; ▪ Laboratory; and ▪ Warehouse and laydown facilities (including Chemical storage area). o Access road intersection to the site. o Electricity transmission to the project site. o Electrical reticulation within the project area to the facilities within scope including reticulation to the Mining Infrastructure Area. o External communications to site and internal communications across site (including data access and distribution). o Reticulation of services (electricity, potable water, fire water, sewage) within the scope. o Surface water diversion. o Raw water collection and reticulation. o Water treatment, sewage treatment and disposal. o Putrescible waste, industrial waste and hydrocarbon waste disposal facility and systems. • A detailed and practical mine plan was developed following Multimine optimisation using CAE NPVS software to determine an economic block models for Makuutu deposits. The Makuutu deposits were scheduled to meet quality targets and processing constraints. Conventional open pit mining is planned to use hydraulic excavators and articulated dump trucks.
Cut-off parameters	• *The basis of the cut-off grade(s) or quality parameters applied.*	• For the 2023 Ore Reserves, a cut-off grade of 200 parts per million (ppm) TREO minus CeO_2 (TREO-CeO_2) was used to generate the Ore Reserves • Ionic Rare Earths Ltd have completed numerous metallurgical studies on composite samples of mineralisation at Makuutu as previously announced to the ASX on 18 February 2020, 26 May 2020, and most recently 4 August 2020. These results together with indicative mining and processing costs and other cost inputs supports application of a marginal cut-off grade of 200 ppm TREO (excluding CeO_2). This cut-off is comparable to peer projects with similar mineralisation types and processing assumptions. • Domain 1,2,3 – Cover zone, and Domain 8,9 – Basement zone are all classified as waste prior to pit optimisation.
Mining factors or assumptions	• *The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).*	• The economic portions of the Mineral Resources were converted to Ore Reserves from pit optimisation, mine scheduling and pit design studies. • Ionic Rare Earths proposes to mine the Makuutu Deposits by conventional open pit mining methods using a selective mining approach. • Mining of Ore is planned to be undertaken on 2 m benches.

Criteria	JORC Code explanation	Commentary
	• *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 (eg pit slopes, stope sizes, etc), grade control and pre-production drilling.* • *The major assumptions made and Mineral Resource model used for 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.*	• The mine designs include pits, haul roads, dump and stockpile designs and water management bunds and dams. • An allowance for grade control and pre-production drilling was included in the mining cost. • A regularised mining block model, as distinct from the sub-blocked resource model, was developed from the resource model by the application of a regular block size and estimation of the Mineral Resource model to a Standard Mining Unit (SMU) mining block model; • An SMU of 10.0 m (X) by 10.0m (Y) by 2.0 m (Z) was used for the Makuutu Deposits. Grades were re-estimated into the SMU but no other dilution is applied other than the inherent dilution built within the geological modelling as precursor to the Resource Modelling and Estimation. Appropriate factors have been added to the regularised mining block model, which has been optimised using Datamine NPVS Optimisation software. The resultant optimal shell was then used as the basis for the detailed design to include pit wall angles and access ramps. • The Ore Reserve model is a recoverable reserve estimate that considers estimation of dilution and ore losses in the estimation based on a SMU. • The Makuutu Feasibility Study considered infrastructure requirements associated with the conventional excavator and truck mining operations. including: heap leach and conveying systems, dump & stockpile locations, plant and maintenance facilities, access routes, fuel, water and power, etc • Mining will involve a pre-strip of 1m of topsoil which will be stockpiled adjacent to the pit. ROM mining will be selective with lower recovered rare earth grade open pit material stockpiled adjacent to the pit, whilst waste will be mined and paddock dumped adjacent to the pit. Open pit material will be hauled to the process plant. Once areas are completely mined out, the mined waste and heap desorption leach residue will be reclaimed and the mining void will be backfilled (progressive rehabilitation), prior to the topsoil spread back on the area disturbed.

Metallurgical factors or assumptions	• *The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.*
	• *Whether the metallurgical process is well-tested technology or novel in nature.*
	• *The nature, amount and representativeness of metallurgical test work 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 to meet the specifications?*
		• The proposed metallurgical process for the Makuutu ore will apply heap desorption leach extraction with membrane solution purification and staged carbonate precipitation. This process has been demonstrated in the laboratory to be appropriate for the ionic adsorption clay style deposit present at Makuutu.
		• Heap desorption leach extraction and staged carbonate precipitation are both mature processing technologies that have been used extensively at commercial scale on ionic adsorption clay style deposits in China as an appropriate method of extracting rare earth elements from this type of ore. Membrane liquid separation is a mature processing technology that is used extensively on a commercial scale in many industrial applications, but is considered novel for the concentration and purification of rare earth elements leached from ionic adsorption clay style deposits.
		• Significant metallurgical test work has been undertaken on Makuutu samples to support the selected recovery factors. These include:
		  ○ Head characterisation (ALS Metallurgy, ANSTO Minerals, BV Minerals, SGS Lakefield)
		  ○ Bottle roll desorption leaches (712 tests at ALS Metallurgy and 330 tests at BV Minerals)
		  ○ Column desorption leaches, mostly at 3 m height, but up to 5 m height (39 tests at BV Minerals and 20 tests at ANSTO Minerals)
		  ○ Agglomeration testing (16 tests at BV Minerals, 10 tests at ANSTO Minerals, and 18 tests

<table>
<tr><th>Criteria</th><th>JORC Code explanation</th><th>Commentary</th></tr>
<tr><td></td><td></td><td>

at HydroGeoSense)
Nanofiltration testing (Ecotechnol)
Precipitation testing (124 tests at ALS Metallurgy)
Material handling testing (Jenike and Johanson)

A variability bottle roll program was performed incorporating 528 drill intervals from various locations across RL1693. TREE-Ce extraction values ranged from 2%-83%.
A variability column desorption leach program was performed using 3 m columns and incorporating 22 composite samples from RL1693. Composites were prepared based on geographical domains and regolith types. TREE-Ce extraction values ranged from 24%-53%.
Two separate bulk samples were tested at two separate laboratories (ANSTO Minerals and BV Minerals) to confirm the suitability of heap desorption leaching for the Makuutu Ore. The samples constituting the composites were prepared from a range of intervals sourced from RL 1693, and were selected based on a wide spatial location and targeted proportions of regolith types approximately equal to the Resource tonnages. The samples were prepared, agglomerated, and loaded into 5 m columns, with test masses being 65-67 kg on a dry basis. Successful irrigation of these bulk samples and extraction of rare earth elements provided assurance that the processes are suitable for the Makuutu Ore. Pregnant desorption liquor solution recovered from these bulk tests was used for nanofiltration testing and precipitation testing.
The reagent consumption values for sulfuric acid, ammonium sulfate, and ammonium carbonate were derived from SysCAD simulation of the process. Inputs to the SysCAD model were taken from Makuutu test work results and thermodynamic data included with the software.
Based on the results of the metallurgical testing and process modelling, average overall recovery estimates for each rare earth oxide are given in the table below:

<table>
<tr><td>La_2O_3</td><td>24%</td><td>Dy_2O_3</td><td>49%</td></tr>
<tr><td>CeO_2</td><td>10%</td><td>Ho_2O_3</td><td>49%</td></tr>
<tr><td>Pr_6O_{11}</td><td>28%</td><td>Er_2O_3</td><td>51%</td></tr>
<tr><td>Nd_2O_3</td><td>33%</td><td>Tm_2O_3</td><td>45%</td></tr>
<tr><td>Sm_2O_3</td><td>33%</td><td>Yb_2O_3</td><td>43%</td></tr>
<tr><td>Eu_2O_3</td><td>38%</td><td>Lu_2O_3</td><td>46%</td></tr>
<tr><td>Gd_2O_3</td><td>45%</td><td>Y_2O_3</td><td>52%</td></tr>
<tr><td>Tb_4O_7</td><td>45%</td><td>Sc_2O_3</td><td>10%</td></tr>
</table>

Deleterious elements for the Makuutu Project are present in the form of semi-soluble gangue minerals that cannot be easily separated, or constitute, the minerals of interest. These deleterious elements include aluminium, calcium, iron, silicon, thorium, uranium, and zinc, all of which are present in the pregnant liquor solution to some extent. These deleterious minerals are rejected

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

Criteria	JORC Code explanation	Commentary
		using membrane solution purification and staged carbonate precipitation, which allow production of a marketable mixed rare earth carbonate product.
Environmental	• *The status of studies of potential environmental impacts of the mining and processing operation. Details of waste rock 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.*	• All required environmental approvals from the Ugandan Government were received in October 2022 for the Makuutu deposits following the approval of the Environment Impact Study Analysis (ESIA) for the development of mining and processing infrastructure in Uganda. • Mining will involve a pre-strip of 1m of topsoil which will be stockpiled adjacent to the pit. ROM mining will be selective with lower recovered rare earth grade open pit material stockpiled adjacent to the pit, whilst waste will be mined and paddock dumped adjacent to the pit. Open pit material will be hauled to the Run-of-Mine (ROM) pad and either stockpiled or direct fed into the process plant. Once areas are completely mined out, the mined waste and heap leach residue will be reclaimed and the slot will be backfilled (progressive rehabilitation), prior to the topsoil spread back on the area disturbed.

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.*	• Mining of the Makuutu deposits is dependent on new development of the following infrastructure:
		  o Open cut operations, haul roads, hydrometallurgical processing plant and associated infrastructure, reagent storage, and
		  o Power reticulation to the mine site from Iganga-Busesa towns.
		• The capital costs for this infrastructure were estimated within the DFS.
		• Transport of all bulk commodities and reagents to site are via road delivered into Mombasa, Kenya and to site, with the main transport routes identified. Acid is proposed to be supplied from an existing sulphuric acid producer on the Kenya-Ugandan border.

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 Government and private.*	• Ionic Rare Earths developed a detailed project financial capital and operating model for the Project. • The capital costs were estimated within the DFS by Mincore Pty Ltd and Ionic Rare Earths with expected accuracy of -10% to +15%. • Operating costs were estimated within the DFS and included allowances for mining, administration, reagent costs, transport to Mombasa and shipping to rare earth refineries; a nominated east coast of the USA. • Freight prices are derived from an independent logistic consultant for the DFS and include port costs and charges, road and sea transportation. • A range of forecast long-term rare earth prices were provided by leading external economic forecasters (Adamas Intelligence) were used in the financial modelling. • Exchange rates are derived from external economic forecasters. • The DFS assumes that a Mixed Rare Earth Carbonate (MREC) containing scandium will be produced on site and sent to a refinery for processing. No allowances were made for penalties for failure to meet specification. • Financial commitments are outlined in the Mining Act by the Ugandan Government. These have been incorporated in the detailed project financial model including production royalties at the rate of 5% of mine-gate gross revenue for Uganda.
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.*	• Financial assumptions used in cost modelling include: - A range of forecast long-term rare earth prices provided by leading external economic forecasters was considered. Ionic used US$120.81/kg as its' long-term rare earth basket price, excluding Sc_2O_3. • A long term Sc_2O_3 price of $775/kg has been applied based on leading external economic

Criteria	JORC Code explanation	Commentary
	• *The derivation of assumptions made of metal or commodity price(s), for the principal metals, minerals and co-products.*	forecasters. Assumption is that the Sc_2O_3 is purity 99.9%. • A payability factor of 70 per cent of the forecast rare earth and scandium prices has been applied for calculating revenue. • As IonicRE is targeting selling MREC ex-China prices should be taken at face value. • No impurity penalties have been applied. Assuming all elements contained in the MREC attract the highest prices in the market – that is high purity carbonate/oxides. • Rare Earth and Scandium production and product quality are derived from the Life of Mine (LOM) schedule.
Market assessment	• *The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.* • *A customer and competitor analysis along with the identification of 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.*	• From 2022 through 2035, global demand for neodymium magnet (NdFeB magnets) is anticipated to increase bolstered by double-digit growth from electric vehicle and wind power sectors, translating to comparable demand growth for the rare earths elements (i.e., neodymium, praseodymium, dysprosium, and terbium) these magnets contain. • Over the same period, global production of neodymium, praseodymium, dysprosium, and terbium will collectively increase as the supply side of the market increasingly struggles to keep up with rapidly growing demand. • From 2023 through 2035, the global rare earth industry is anticipated to consistently underproduce neodymium, praseodymium, dysprosium and terbium oxides (or oxide equivalents), resulting in the depletion of historically accumulated inventories and, ultimately, shortages of these critical magnet materials if supply is not increased beyond levels currently anticipated. • The Makuutu project offers broad economic exposure to the rare earth permanent magnet sector, which is the fastest-growing end-use category and most in need of additional rare earth supplies. • From a marketing, logistics and economic standpoint, the high proportion of valuable magnet-related rare earth elements in the Makuutu Project's prospective TREO production means that a future mine (with separation) could generate approximately 83% of its rare earths revenues from just 31% of its production volume (NdPr, Dy and Tb oxide). • Financial modelling in real terms, including sensitivity analysis, was also completed. This shows that Makuutu remains economically viable at US$53.37/kg rare earth basket price.
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.*	• LOM financial model demonstrates that, based on the assumptions set out above, the Makuutu Rare Earths Project will generate significant Net Present Value (NPV) after tax using a discount rate of 8%. • The NPV is most sensitive to Rare Earth and scandium prices, metallurgical recoveries, operating cost and capital costs.
Social	• *The status of agreements with key stakeholders and matters leading to social licence to operate.*	• Ionic Rare Earths, through Rwenzori Rare Metals Ltd, has been exploring and undertaking project development activities in the Republic of Uganda since 2019 respectively and has a good relationship with the local community and key stakeholders. • Rwenzori Rare Metals Ltd, has been operational in Uganda and working on the Makuutu Rare Earths Project since 2016, and has a significant Ugandan workforce. • The Company, via RRM, has initiated the next phase of land access agreements over the MLA at RL 1693, to agree a staged development at Makuutu with local landowners. Discussions and engagement with landowners are progressing well and the Company will update the market

Criteria	JORC Code explanation	Commentary
		accordingly
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 to the 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.*	• Major risks are Rare Earth price variation, failure of the western Rare Earth supply chain to mature due to a lack of investment in downstream capacity, delays in construction and ramp up of operations, foreign exchange rates, capital cost of the project, foreign jurisdiction and political, production and operational risks. • The main Makuutu Deposits (Central Makuutu and Central Makuutu East) containing majority of the Mineral Resources and Ore Reserves are located in Uganda on Retention Licence 1693. This permit was granted to Rwenzori Rare Metals (a Ugandan subsidiary) on 2 November 2017 for an initial period of 3 years and was renewed (2 November 2020) for another 2 years. On 1st September 2022, Rwenzori Rare Metals Ltd applied for a Mining licence (MLA TN03834) over RL1693, itis anticipated that this will be granted during Q2 2023. • The other Makuutu deposits containing the remaining Mineral Resources are contained in retention licences (RL00234 and RL00007) and are in good standing. • Land Ownership is developed established through Land Access Agreements. The Company, via RRM, has initiated the next phase of land access agreements over the MLA at RL 1693, to agree a staged development at Makuutu with local landowners. Discussions and engagement with landowners are progressing well and the Company will update the market accordingly
Classification	• *The basis for the classification of the Ore Reserves into varying confidence categories.* • *Whether the result appropriately reflects the Competent Person's view of the deposit.* • *The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any).*	• A total of 172.9 million tonnes of Ore Reserves, with a TREO grade of 848 ppm, have been classified as Probable. The Ore Reserves were based on the current RL 1693 inventory of Indicated Mineral Resources only (comprising 259 million tonnes grading 740 ppm TREO). • Mr Lee White, Mr Stephen McEwen and Mr Will Goodall are satisfied that the stated Probable Ore Reserves accurately reflect the outcome of mine planning and the input of economic parameters and metallurgical recoveries into pit optimisation studies. • There were no Measured Mineral Resources.
Audits or reviews	• *The results of any audits or reviews of Ore Reserve estimates.*	• No audit or review has been undertaken.
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. For example, the application of statistical or geostatistical procedures to 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 should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.* • *Accuracy and confidence discussions should extend to*	• The Ore Reserve estimate is the outcome of a study undertaken to a Feasibility Study level with geological, metallurgical, geotechnical, engineering and mining engineering considerations. It has a nominal accuracy of ± 15% and applies to global estimates. • Certain statements concerning the economic outlook for the Rare Earths mining industry, financing a large capital project, expectations regarding Rare Earths, production, cash costs and to the operating results, growth prospects and the outlook of IonicRE's operations including the likely financing and commencement of commercial operations of the Makuutu Rare Earths Project and its liquidity and capital sources and expenditure, contain or comprise certain forward-looking statements regarding IonicRE's operations, economic performance and financial condition. No assurance can be given that such expectations will prove to have been correct. Accordingly, results could differ materially from those set out as a result of, among other factors: changes in economic and market conditions, deterioration in the rare earth market, deterioration in debt and equity markets that lead to the Project not being able to be financed, success of business and operating initiatives, changes in the regulatory environment and other government action, fluctuations.

Criteria	JORC Code explanation	Commentary
	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 production data, where available.*	