

16 September 2020

## IONIC PRESENTING AT REE V-CON

Ionic Rare Earths Limited (“IonicRE” or “the Company”) (ASX: IXR) is presenting at the Stockhead video conference “Rare earths – rare upside”.

### **Stockhead Investor Video Conference “Rare earths – rare upside ”**

The full video presentation from Chief Executive Officer Tim Harrison can be viewed from Wednesday 16<sup>th</sup> September 2020 using the following URL:

<https://stockhead.com.au/stockhead-tv/v-cons/v-con-rare-earth>

A copy of the presentation is attached to this announcement.

Authorised for release by Brett Dickson, Company Secretary.

\*\*\*\*\* ENDS \*\*\*\*\*

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# Investor Presentation

Advancing the Makuutu Rare Earths Project

28 August 2020

# Important Notice and Disclaimer

This presentation should be considered in its entirety. If you do not understand the material contained in this presentation, you should consult your professional advisors. The sole purpose of this presentation is to provide shareholders with an update on current activities of the Company and the current state of exploration at the Makuutu Rare Earths Project in the Uganda.

Any statements which may be considered forward looking statements relate only to the date of this presentation document. Such forward looking statements involve known and unknown risks, uncertainties and other important factors beyond the Company's control that could cause actual results, performance or achievements of the Company to be materially different from future results, performance, or achievements expressed or implied by such forward looking statements. As a result of these factors, the events described in the forward-looking statements in this document may not occur.

Notwithstanding the material in this presentation, shareholders should consider that any investment in the Company is highly speculative and should consult their professional advisers – whether scientific, business, financial or legal – before deciding whether to make any investment in the Company

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## Competent Person Statements

Information in this report that relates to previously reported Exploration Targets and Exploration Results has been cross-referenced in this report to the date that it was originally reported to ASX. 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 announcements.

The information in this report that relates to Mineral Resources for the Makuutu Rare Earths deposit was first released to the ASX on 23 June 2020 and is available to view on [www.asx.com.au](http://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.

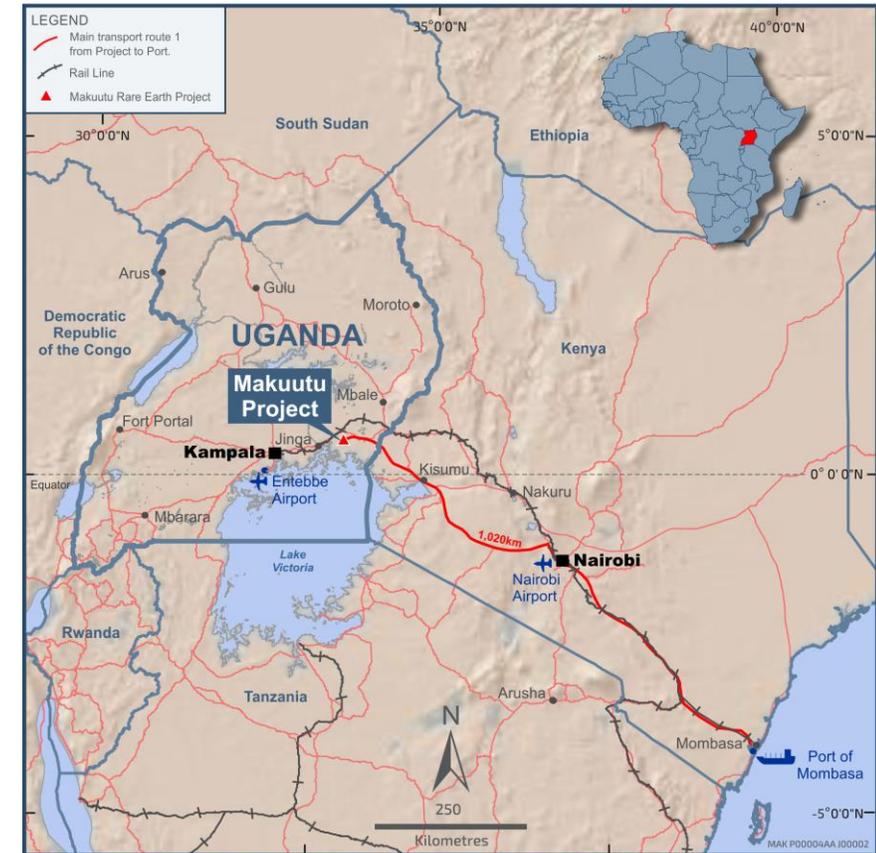
# A Major, Low-Cost Rare Earths Development Opportunity

## IXR developing the Makuutu Rare Earths Project

- Makuutu is a strategically / geopolitically significant Rare Earth Elements (“REE”) project located in Uganda, at advanced exploration and development study stage
- Confirmed ionic clay rare earth mineralisation, akin to Chinese ionic clay projects, and clay-hosted deposits are currently the lowest-cost sources of critical and heavy rare earths in the world
  - Majority (>95%) of global supply of Heavy Rare Earths originating from these ionic clays
- Updated Mineral Resource Estimate underpins massive potential with more drilling to come in the next 6 months
- Near-surface, high-grade exploration results indicate low-cost mining pathway
- Scoping Study / Preliminary Economic Assessment underway and expected to be completed in November 2020
- IXR presently at 31% ownership, moving to 51% within coming months via earn-in, then up to 60% on completion of Feasibility Study

## Project area well supported with excellent infrastructure

- Easy highway and road access to site, nearby power infrastructure with readily available hydropower, rail, cell phone communications and water availability



Makuutu Rare Earths Project Location

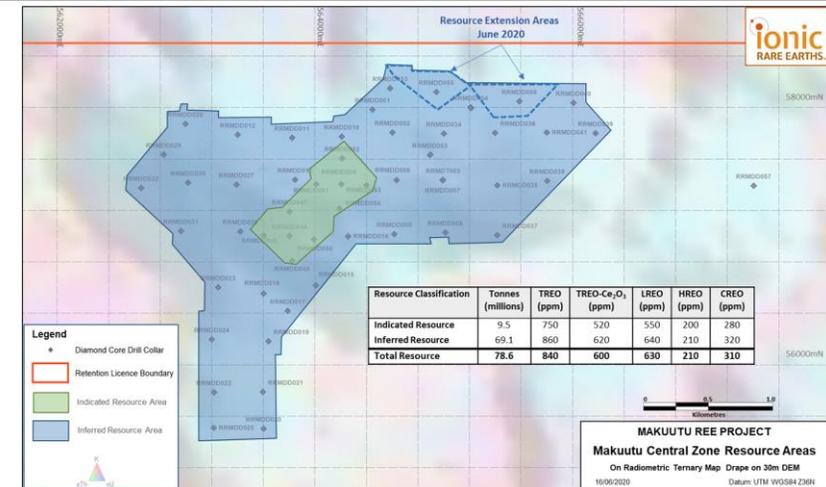
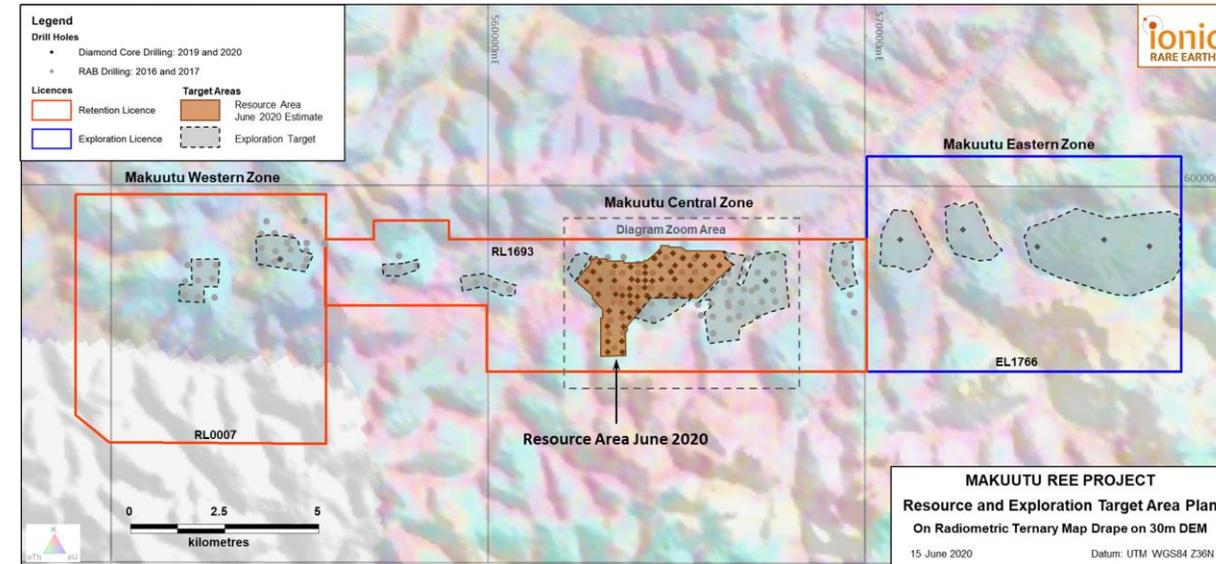
# Updated Mineral Resource Estimate

- 903m of drilling in 2019 and 2020 defining MRE
- Makuutu Mineral Resource Estimate<sup>1</sup> reported above a 300 ppm TREO less Ce<sub>2</sub>O<sub>3</sub> marginal cut-off grade
  - MRE contains Clay domain only
- 2020 drilling program resumed mid July
  - 3,700m Phase 2 core drilling program
  - 104 holes (1,658m) drilled to date, avg. depth = 15.9m
  - 26 km of mineralisation corridor to explore (upside!)
  - Resource extension drilling covering addition 4 x exiting MRE area

Category	Estimation Domain	Tonnes (Mt)	TREO (ppm)	TREO no Ce <sub>2</sub> O <sub>3</sub> (ppm)
Indicated Resource	Clay	9.5	750	520
Inferred Resource	Clay	69.1	860	620
<b>Total Resource</b>	<b>Clay</b>	<b>78.6</b>	<b>840</b>	<b>610</b>

\* Rounding has been applied to 0.1Mt and 10ppm which may influence grade average calculations.

<sup>1</sup> ASX announcement 23<sup>rd</sup> June 2020.



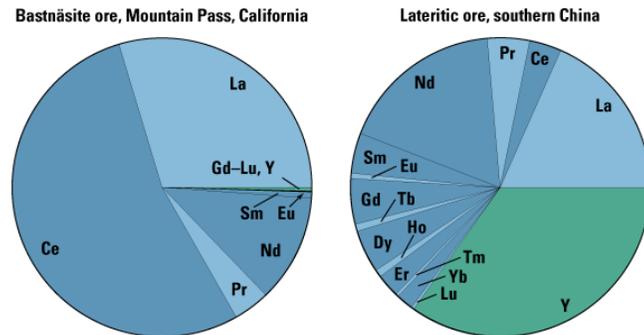
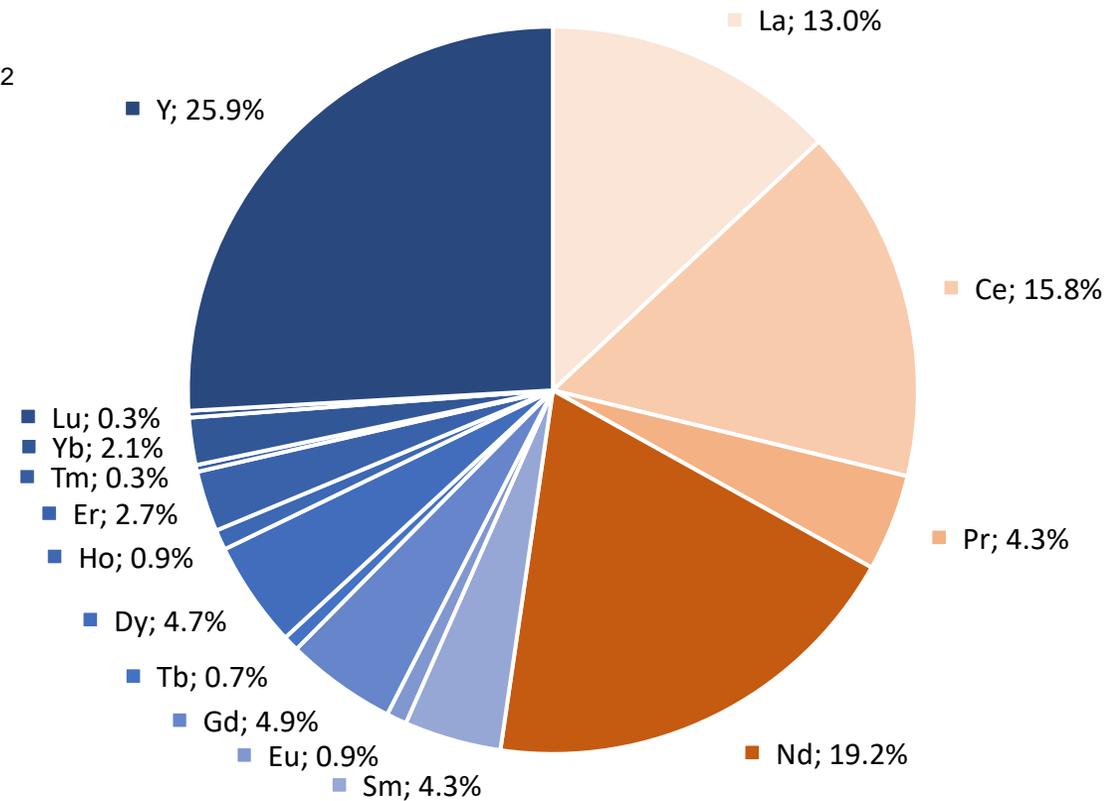
# Ionic Clay REE vs. Hard Rock REE Projects

Significant project and cost advantages associated with ionic clay projects like Makuutu

MINING/PROCESSING STAGES	IONIC ADSORPTION CLAY-HOSTED REE	HARD ROCK-HOSTED REE
<b>MINERALISATION</b>	Soft material, negligible (if any) blasting Elevated HREO/CREO product content	Hard rock; Bastnaesite and Monazite (LREO dominant); Xenotime (HREO dominant)
<b>MINING</b>	Low relative operating costs: Surface mining (0-20 m) Minimal stripping of waste material Progressive rehabilitation of mined areas	High relative operating costs: Blasting required Could have high strip ratios
<b>PROCESSING – MINING SITE</b>	No crushing or milling Simple process plant Potential for static or in-situ leaching with low reagent consumption at ambient temperature	Comminution, followed by beneficiation that often requires expensive (flotation) reagents to produce mineral concentrate
<b>MINE PRODUCT</b>	Mixed high-grade rare earth precipitate, either oxide or carbonate (+90% TREO grade) for feedstock directly into rare earth separation plant, low LaCe content	Mixed REE mineral concentrate (typically 20 – 40% TREO grade), high LaCe content, requires substantial processing before suitable for feed to rare earth separation plant
<b>PRODUCT PAYABILITY</b>	70-80% payability as a mixed Rare Earth oxide/carbonate/chloride	35-40% payability as a mineral concentrate
<b>PROCESSING - ENVIRONMENTAL</b>	Non-radioactive tailings Solution treatment and reagent recovery requirements (somewhat off-set by advantageous supporting infrastructure)	Tailings often radioactive (complex and costly disposal) Legacy tailing management
<b>PROCESSING – REFINERY (TYPICALLY NOT ON MINING SITE)</b>	Simple acid solubilisation followed by conventional REE separation Complex recycling of reagents and water	High temperature mineral “cracking” using strong reagents to solubilise the refractory REE minerals Complex capital-intensive plant required Radionuclide issues follow REE mineral concentrates

# Makuutu Basket – Strategic Alternative for CREO/HREO

- Product generated from metallurgical optimisation testwork<sup>1</sup> infers basket price of approx. US\$34.40/kg REO using June 2020 spot pricing<sup>2</sup>
- Ionic Adsorption Clay (IAC) products achieve payability of 70-80%, so value circa US\$24 to US\$27.50/kg REO
- Product contains > 51% Critical REO, > 47% Heavy REO
- Strategically important supply alternative for CREO/HREO
- Basket quality generated from IACs is superior to bastnaesite / monazite mineral concentrate products, circa US\$10 to US\$18 / kg REO value (using June 2020 spot pricing<sup>2</sup>), with only 35-40% payability, i.e. US\$3.50-US\$7.20/kg REO value



**Figure 6.** Proportions of individual REE in two representative ores: bastnaesite, dominated by La, Ce, and Nd, with Eu through Lu plus Y totaling only 0.4%; and lateritic ion-adsorption ore, Y-dominated. Dark blue and light blue sectors represent lanthanides of even and odd atomic number, respectively (see figs. 2, 3). Yttrium is indicated by green.

Comparison on the left of two baskets<sup>4</sup>, on left Bastnaesite at Mountain Pass (USA) with nearly 80% made up of low value LaCe product, and only 35/40% payable without significant capital expenditure to process, compared to the more valuable basket on the right which is a south Chinese Ionic Adsorption clay where LaCe only makes up approx. 23% of the basket, and payability exceeds 70%.

<sup>1</sup> ASX announcement 26<sup>th</sup> May 2020; <sup>2</sup> REO Pricing Spot June 2020 - <https://institut-seltene-erden.de/unser-service-2/metall-preise/seltene-erden-preise/>;

<sup>3</sup> Rounding has been applied; <sup>4</sup> Rare Earth Elements—Critical Resources for High Technology \_ USGS Fact Sheet 087-02\_files;

# Tier-One Infrastructure already there!

## Logistics

- ✓ Approximately 10 km from Highway 109, connecting Makuutu to both capital city Kampala and Port of Mombasa, Kenya
- ✓ Approximately 20 km from rail line connecting to Port of Mombasa

## Power

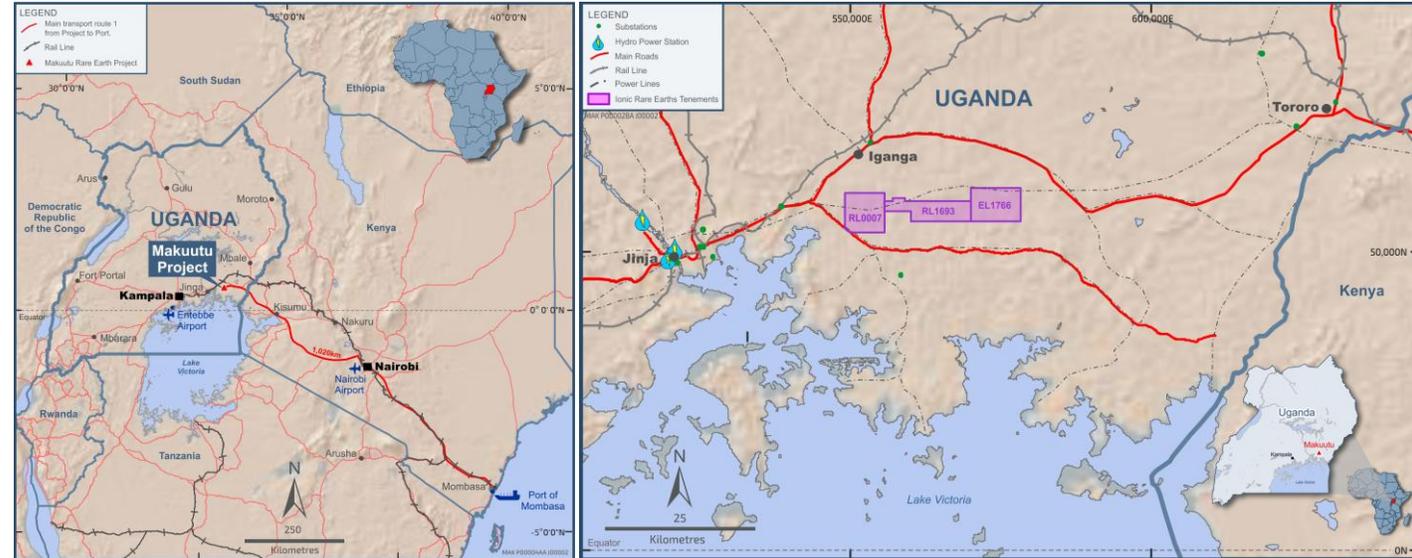
- ✓ Large hydroelectric generation capacity within 80 km of Makuutu project area will deliver very low-cost power
- ✓ Existing electrical grid infrastructure near to site

## Water

- ✓ Plentiful fresh water within and near project area

## Workforce

- ✓ Low-cost professional local workforce



Makuutu Rare Earths Project site and existing Infrastructure Access



Images; From left, Isimba hydroelectric dam with 183 MW installed capacity at Jinja, rail line connect to Kampala and Port of Mombasa, all weather access roads connecting site to highway, sealed highway running directly adjacent site, and 132 kV power lines running through site.

# Development highlights since Acquisition

- Announcing an updated Mineral Resource of **76.8 Mt @ 840 ppm Total Rare Earths Oxide (TREO)**<sup>1</sup>, at a cut-off grade of 300 ppm TREO-Ce<sub>2</sub>O<sub>3</sub>; while maintaining its Exploration Target at:

**270 - 530 million tonnes grading 0.04 – 0.1% (400 – 1,000 ppm) TREO**<sup>2</sup>

*This Exploration Target is conceptual in nature but is based on reasonable grounds and assumptions. There has been insufficient exploration to estimate a Mineral Resource and it is uncertain if further exploration will result in the estimation of a Mineral Resource.*

- Shallow, near surface orebody, with clay layer averaging 11.9m thick under cover approximately 3m deep;
- Achieving encouraging **metallurgical recoveries of up to 75% TREE-Ce**<sup>3</sup> (Total Rare Earth minus Cerium) using simple extraction techniques – desorption/leaching and precipitation;
- Heavy rare earth elements (HREE<sup>4</sup>) generally achieve higher recovery compared to the Light rare earth elements (LREE<sup>5</sup>), with average HREE recovery typically being double the average LREE recovery;
- Exploring analogous low CAPEX, low OPEX modular processing options enabling short construction lead time and ramp up to commercial production, and scalable modules to increase production capacity very quickly;
- Rare Earth product is dominant in critical rare earth elements (CREE<sup>6</sup>), with Nd + Eu + Tb + Dy + Y > 50% of product mass, or > 55% when including Pr, leading to high basket price product
- Strong project support within Uganda from community and government to develop the Makuutu Rare Earths Project.

<sup>1</sup> ASX announcement 23<sup>rd</sup> June 2020; <sup>2</sup> ASX announcement 4 September 2019; <sup>3</sup> ASX announcement 18 February 2020; <sup>4</sup> HREE = Sm + Eu + Gd + Tb + Dy + Ho + Er + Tm + Yb + Lu + Y; <sup>5</sup> LREE = La + Ce + Pr + Nd;

<sup>6</sup> CREE = Nd + Eu + Tb + Dy + Y;

# Target Pathway to Development

	COMPLETED	COMPLETE BY
Re-assay of selected historical samples confirms presence of Rare Earths	✓	
First-pass metallurgy confirms presence of ionic-clay hosted REEs	✓	
Initial Core Drilling Program	✓	
Phase 1 Metallurgical Testing recovers up to 75% TREE-Ce	✓	
JORC-compliant Mineral Resource Estimate (updated)	✓	
Phase 2 Core Drilling Program		Q4, 2020
Environmental Baseline Monitoring		Q4, 2020
Environmental and Social Impact Assessment (ESIA) – Stage 1		Q4, 2020
Phase 2 Metallurgy and Process Engineering		Q4, 2020
Mining, Tailings and Infrastructure Assessments and Studies		Q3, 2020
Scoping Study / expenditure to earn 51% Project Interest		Q4, 2020
Bankable Feasibility Study	Commence Q4, 2020	

## Objective: Makuutu to Supply Low-Cost, High-Value Critical and Heavy Rare Earths

- ✓ Strategically and geopolitically significant Critical / Heavy Rare Earths supply in stable jurisdiction
- ✓ Strong interest for Makuutu as an ionic clay hosted REE deposits given their demonstrated simple low-cost nature
- ✓ Impressive exploration results from drill program
- ✓ Large Mineral Resource Estimate defined with scope for substantial growth with further drilling
- ✓ Metallurgical results indicate simple low-CAPEX and low-OPEX mining and processing operation potential allowing modular expansion
- ✓ Experienced and proven team in place to advance Makuutu through development to operations stage
- ✓ Active development pathway leading to regular newsflow throughout 2020 into 2021
- ✓ Third party strategic interest in Makuutu

# Ionic Rare Earths Limited Corporate Snapshot

## CAPITAL STRUCTURE (As At 27/08/2020)

Shares Outstanding	2,696,128,086
Total Options Outstanding	448,000,000 <small>(exercisable at 0.75 to 1.8 cents)</small>
Performance Rights	66,700,000
Share Price	A\$0.011
Market Capitalisation	A\$29.7 million
52 week share price range	A\$0.002 – A\$0.015
Cash Balance	A\$3.55 million
<b>IXR MAJOR SHAREHOLDERS</b>	
Major Shareholders	17%
Executives, Directors & Key Advisors	8.7%

## SHARE PRICE (ASX: IXR) *(Last 14 months since Makuutu Acquisition)*





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