ASX Announcement **6 February 2020**

MAKUUTU RARE EARTH PROJECT

INITIAL METALLURGICAL RESULTS OF UP TO 75% RECOVERIES

ORO VERDE LIMITED (ASX code: OVL)

An emerging resource company focused on defining a world-class Rare Earths project

KEY PROJECTS –
Uganda
Makuutu Rare Earths Project
Nicaragua
San Isidro Gold Project

BOARD OF DIRECTORS
Executive
Marc Steffens
Brett Dickson
Non-Executive
Tony Rovira - Chairman

MANAGEMENT - UGANDA
Tim Harrison – Makuutu PM

MANAGEMENT - NICARAGUA
Jacques Levy - Legal Rep.

REGISTERED OFFICE
Level 1, 34 Colin St,
West Perth, WA 6005
AUSTRALIA
+61 (0) 8 9481 2555

WEBSITE
www.oroverde.com.au

Key Highlights:

- **Multiple, sizeable areas of mineralisation achieved excellent metallurgical recoveries;**
- **Metallurgical recoveries of up to 75% TREE-Ce (Total Rare Earth minus Cerium) were achieved using simple extraction techniques;**
- **Recoveries for high value HREE consistently higher than LREE recoveries;**
- **Recoveries compare favourably to other known ionic clay hosted rare earth projects;**
- **Deleterious elements Uranium and Thorium are consistently low across the deposit meaning radioactive tailings and/or concentrates are expected to be immaterial; and**
- **These positive initial metallurgical results indicate a low-CAPEX development scenario comprising:**
    - **multiple, semi-portable satellite leaching plants located adjacent to mining areas**
    - **small central finishing plant for production of a saleable mixed rare earth product**

Oro Verde Limited ("Oro Verde" or "the Company") (ASX: OVL) is pleased to provide preliminary metallurgical assessments and resulting anticipated low-CAPEX project configuration on the Makuutu Rare Earths Project.

Commenting on the metallurgical results and envisaged development pathway, Oro Verde Technical Director Dr Marc Steffens said:

"The initial metallurgy program indicates that a simple process route is suitable for treating Makuutu mineralisation. Multiple, sizeable areas of mineralisation achieved metallurgical recoveries that exceeded our expectations by using low acid additions and we expect that the next phase of project development will further enhance these outcomes.

"Based on results that we have achieved to date, it appears the Makuutu Project compares very favourably to other clay-hosted rare earths project located outside of China such as the BioLantanidos Project in Chile that has

recently secured substantive investment for project development. [1] *These assets are very strategic assets for future rare earth supply, as seen by various governmental agencies actively seeking to secure Rare Earth resources for their consumption, as well as Chinese state moves to restrict rare earths production from Chinese ionic clay sources."*

"We are excited to be able to take this project to the next level and are accelerating our efforts based on the highly successful initial drilling program and these metallurgical results. This year we will be executing a substantive body of work – under the direction and management of the Company's newly appointed Project Manager, Tim Harrison – to develop the project and ultimately work toward achieving a commercial outcome for the Company and its shareholders."

Metallurgical Process Development

An initial phase of metallurgical test-work and engineering analysis has been undertaken to broadly gauge the metallurgical and process requirements to recover rare earths from Makuutu mineralisation. The key findings of this work are summarised in Table 1.

Collectively the findings demonstrate the low-cost nature of processing ionic clay rare earth mineralisation with low reagent consumptions, and also highlight potential to develop a recovery process with a low capital cost. The results are preliminary and substantive further testing and development work is necessary to adequately define and optimise the appropriate processing scheme for Makuutu mineralisation, however the initial results are highly encouraging and provide a substantive base for a rigorous process development program.

Table 1. Summary of Key Outcomes from Process Development Testwork and Analysis.

Parameter	Result	Significance
Desorption Salts (leaching)	Demonstrated desorption of rare earths using ammonium sulfate (a common fertiliser) and sodium chloride (table salt).	Low OPEX Cheap reagents. Low-cost natural salt sources located near may be suitable.
Salt requirement	Demonstrated that low salt concentrations (~13-70 g/L ammonium sulfate) are effective in desorbing rare earths.	Low OPEX Recycling of salt solution expected to be a part of the process.
Desorption pH	Demonstrated desorption of ionic clay rare earths can occur at pH between 3.0 – 5.0. Diagnostic tests indicate some mineralisation may require lower pH for higher rare earth extraction.	Low OPEX Natural pH of solutions is ~pH 5, thus anticipated acid requirement is low.
Desorption kinetics	Desorption kinetics are rapid, with agitation assisted desorption complete within 15 minutes.	Low CAPEX Suggests smaller process equipment required (low residence times).
Beneficiation	Potential to beneficiate mineralisation by screening.	Low OPEX
Viability of Static Leach	Demonstrated desorption of rare earths without any agitation applied (static leach).	Low CAPEX Indicates that static leach options may be viable and should be examined further.
Reagent recycle	Preliminary analysis of solution chemistries indicates that reagent can be recycled using membrane systems.	Low OPEX. Availability of low-cost power at project site to allow effective washing and recycling of salt reagent.

[1] Market Announcement, 2/10/2019, "Hochschild acquires the BioLantanidos Ionic Clay Rare Earth deposit in Chile". Available: http://www.hochschildmining.com/en/investors/news.
Market Presentation, 11/9/2018, Susaeta, A. "BioLantanidos Minera – Ion Clay Extraction and Processing".

Initial Metallurgical Evaluation

High-level metallurgical tests were undertaken on select intervals of core with the aim of broadly identifying areas to target initial project development efforts and also gaining insights for further testwork and optimisation.

This initial testwork was based on selected intervals of core from 29 holes RRMDD 001 - 033[2], which were generally spaced on a wide 400 x 400 m pattern. Samples were selected to broadly assess metallurgical performance of mineralisation from differing geological characteristics and regolith zones covering a range of depths from surface. The test-work was undertaken at ALS Metallurgy laboratories in Perth, Western Australia, and reviewed by Mr Hayden Buswell of Southern Cross Mining consultants.

Given the aims of this work are high-level in nature, simple bottle-roll leaching tests were undertaken using ammonium sulfate as the lixiviant at pH 3.5. The results of the tests on various clay intervals were used to calculate interval-weighted average extractions in the clay mineralisation in each hole. From these tests it was found that:

- Testing demonstrated high rare earth recoveries of up to 45 – 75% TREE-Ce[3] even with very low acid addition in 3 holes, which trended towards the Western side of the drilled area,
- A recovery greater than 30% TREE-Ce with very low acid addition was achieved in 16 holes,
- Only 3 holes returned REE recovery of less than 10% TREE-Ce, demonstrating only a small amount was generally not responsive,
- Importantly, testwork that was undertaken in parallel to these preliminary results, owing to the short timeframe in which the testing program was undertaken, has indicated that using a lower pH and allowing a longer leach time will allow markedly improved recoveries by capturing rare earths present in a colloidal phase. This optimisation will be pursued in future test-work, and with results up to 75% recoveries already, the outlook for further improvement is highly encouraging,
- Heavy rare earth elements (HREE) generally and consistently achieve higher recovery compared to the Light rare earth elements (LREE), with average HREE recovery typically being double the average LREE recovery. With HREE typically higher value than LREE, this will equate to a higher value finished product.

These collective results demonstrate the metallurgical potential and justify the further pursuit of defining the Makuutu Rare Earth Project. The results also provide insight to processing requirements, which will be used as a foundation for further, more expansive, metallurgical testwork planned for 2020 that is needed to adequately define the metallurgical requirements of the project.

[2] Holes not tested were RRMDD 022 (anomalously thin clay intercept) and holes RRMDD 022 and RRMDD 025 (did not meet TREO grade criteria).

[3] Metallurgical recovery has been calculated using the assayed TREE-Ce in solutions and residues after leaching/desorption, not the extraction efficiency of the 'recoverable' portion, as is reported by owners of other projects. The latter method of reporting inflates actual recovery values by discounting the non-desorbable component in the head sample.

Anticipated Project Configuration

The preliminary metallurgical results are highly promising, with the majority high recoveries from low reagent (salt and acid) use enabling the consideration of a very low-CAPEX leaching operation to liberate the rare earth minerals for sale. The company is currently exploring a project configuration that consists of several low-CAPEX satellite leaching/desorption plants from which concentrated rare earth streams will be transferred to a central plant for finishing and packaging. A conceptual arrangement of this configuration is presented in Figure 3.

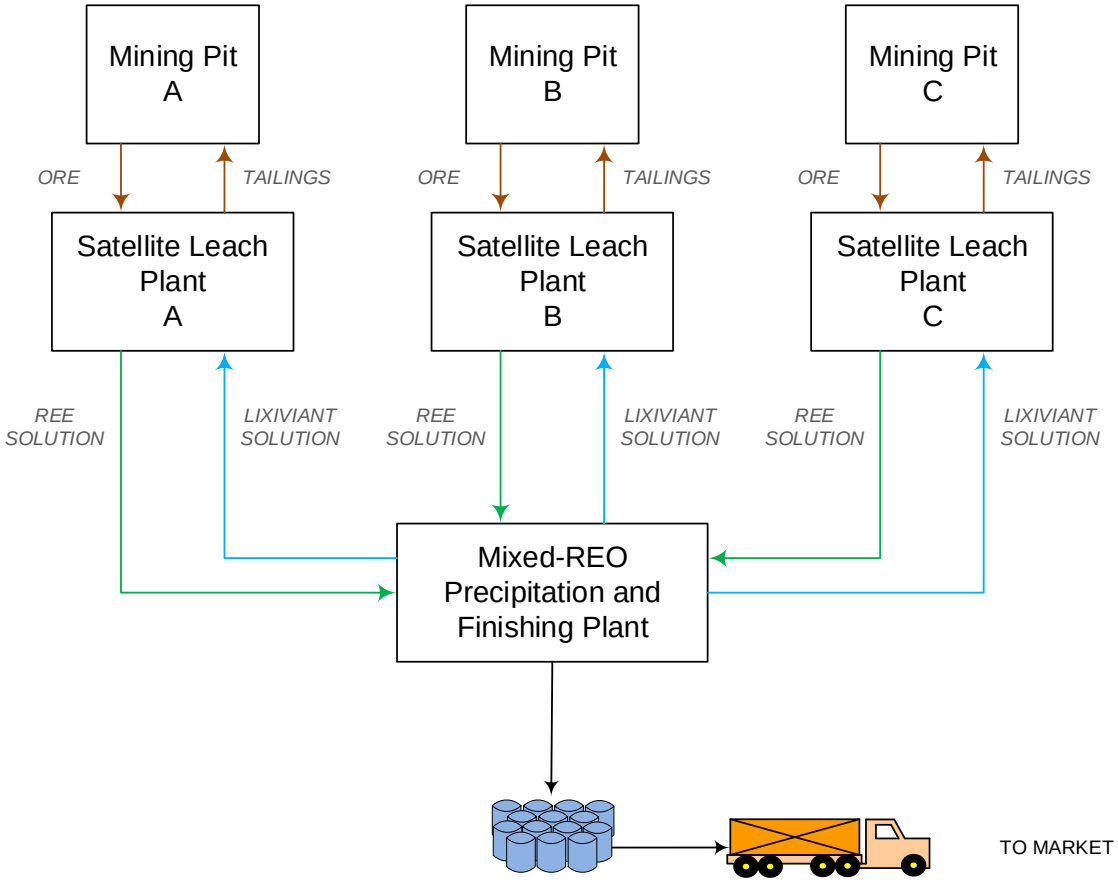

Figure 3. Conceptual Arrangement of the Envisaged Makuutu Rare Earth Project.

Next Steps

The company is currently planning details of the ensuing drilling and development program. The development program over the next 12 months will consist of the various development activities and will culminate in the delivery of a feasibility assessment and preparation of practicalities for a pilot or demonstration plant. The work plan going forward will include the following activities:

- In-fill drilling of already drilled areas to provide further resource definition and also provide sample for additional metallurgical testing;
- Exploration drilling in areas that are only sparsely drilled or are yet to be drilled;
- Calculation of Mineral Resource Estimates;
- Metallurgical process development testwork to support preliminary engineering;
- Resource development and mining studies;
- Environmental and social assessments;
- Product marketing and engagement with off-take partners; and
- Feasibility assessments with completion of a scoping study.

Project Overview

The Makuutu Rare Earth Project, located in Uganda, is significant in size and is understood to be potentially one of the largest ionic clay deposits outside of China. Drilling at the project site to date totals 47 diamond core holes and 109 historic RAB holes, with the Company working toward validating its previously announced exploration target of (ASX: 4 September 2019):

270 - 530 million tonnes grading 0.04 – 0.1% (400 – 1,000 ppm) TREO*.

***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.

The Makuutu Rare Earth Project contains ionic clay-hosted rare earth mineralisation, like those found in China, which are the source of the majority of the world's heavy rare earths production, and vastly different to hard rock-hosted rare earths projects. Mineralisation at Makuutu occurs from surface to depths of 15-20 metres where simple shallow mining methods will be applicable. The processing of ionic clays is also simple, where the clay undergoes a simple desorption process – akin to washing – in which rare earths are desorbed from the ore into a salt solution, concentrated and precipitated to create a mixed rare earth product. Tailings (the washed clay) are expected to be returned to the mined open pits and areas progressively rehabilitated. The process is expected to have a small environmental footprint while capital and operating costs are expected to be low.

The project area is well supported with infrastructure, which is illustrated in Figure 4. There is substantive nearby hydroelectric generation capacity with electrical grid infrastructure nearby to the project area, the project area is readily accessible with existing road and rail infrastructure nearby that connects to Kampala and Port of Mombasa, and the area has cell phone coverage. Additionally, nearby centres present a pool for a professional workforce.

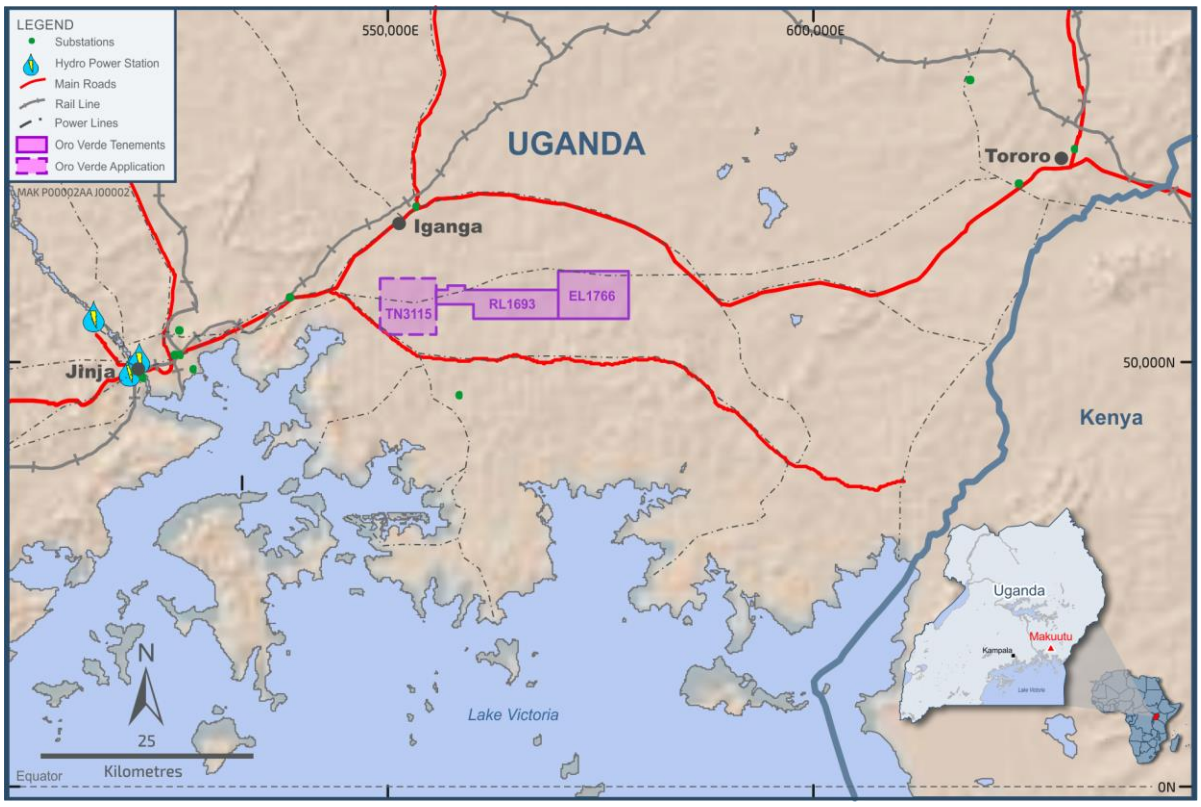

Figure 4. Map Showing Infrastructure Nearby to the Project.

The Company has acquired a 20% interest in the project and is working toward acquiring up to a further 40% interest via an "earn-in" process through the expenditure of funds, bringing its total potential interest in the project to 60%.

Key project highlights:

1. Ion Adsorption Clay deposits are currently the lowest cost sources of rare earths in the world,
2. Favourable concentration of high demand rare earths – Tb, Dy, Pr and Nd,
3. Simple and low-cost mining, and
4. Simple processing to produce a high-value concentrate.

***** ENDS *****

Authorised for release by Brett Dickson, Company Secretary

For enquiries contact:
Marc Steffens
Executive Director
+61 8 9481 2555

Brett Dickson
Company Secretary
+61 8 9481 2555

Competent Persons Statement

The information in this announcement and that relates to metallurgy testwork is based on information reviewed by Mr Hayden Buswell who is a director of Southern Cross Mining and a consultant to Oro Verde Ltd. Mr Buswell is a member of AusIMM. Mr Buswell 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 Buswell consents to the inclusion in this announcement of the matters based on their information in the form and context in which it appears.

Information in this report that relates to previously reported Exploration Targets and Exploration Results has been crossed-referenced in this report to the date that it was originally reported to ASX. Oro Verde Limited confirms that it is not aware of any new information or data that materially affects information included in the relevant market announcements.