

# Mkango Announces Results Of Flotation Piloting With Significantly Higher Recoveries And Concentrate Grade, And Commencement Of Hydrometallurgical Piloting

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LONDON and VANCOUVER, May 04, 2021 - [Mkango Resources Ltd.](#) (AIM/TSX-V: MKA) (the "Company" or "Mkango") is pleased to announce results of the flotation pilot plant programme completed at ALS Metallurgy in Perth, Australia, which was effective in scaling up a new, optimised flotation regime for the Songwe Hill Rare Earths Project ("Songwe") located in Malawi.

- The flotation piloting programme demonstrated that the flotation process is robust and straightforward to scale up and the results support a significant increase in both flotation recoveries and concentrate grade for the feasibility study versus the design criteria for the 2015 pre-feasibility study for Songwe:
  - Significant increase in flotation recovery of total rare earth oxides ("TREO") to 74% from 67%;
  - Tripling of flotation concentrate grade to 15% TREO from 4.7% TREO;
  - Substantial increase in flotation upgrade, with the optimised flotation regime increasing the run-of-mine ("RoM") ore grade by 10 times versus three times in the pre-feasibility study; and
  - Positive impact on downstream integrated hydrometallurgical operations.
- The flotation pilot plant generated over one tonne of flotation concentrate for hydrometallurgical pilot processing at ANSTO, the first phase of which is underway.
- The ongoing feasibility study for Songwe envisages processing of flotation concentrate via an integrated hydrometallurgical processing plant, located adjacent to the Songwe operations in Malawi, targeting a high grade purified mixed rare earth carbonate grading greater than 50% TREO.
- The flotation and hydrometallurgical pilot plants provide SENET (a DRA Global Group Company) with key design parameters and essential operating data to assist it in the engineering of the Company's commercial scale operation.
- The results strengthen Mkango's position as one of the very few companies outside China with an advanced stage project positioned to supply the critical rare earths essential for the green transition.

William Dawes, Chief Executive of Mkango stated: *"These excellent flotation pilot results for the Songwe feasibility study are a significant improvement versus the 2015 pre-feasibility study and is expected to have a positive impact on downstream hydrometallurgical operations, the piloting for which has already commenced. In contrast to many competing projects, during commercial operations the flotation concentrate will be processed in the country of origin, via an integrated hydrometallurgical plant, as opposed to being exported, meaning greater efficiencies and value added in-country. Completion of flotation piloting is a major milestone for Mkango and further positions the Company as one of the very few advanced stage rare earth projects positioned to meet demand from accelerating growth in the electric vehicle sector, wind power generation and other industries driven by decarbonisation of the economy."*

The higher flotation concentrate grade and lower mass pull has a positive impact on hydrometallurgical processing as it means less tonnes, but higher-grade concentrate containing more rare earths, entering the integrated hydrometallurgical plant as illustrated in the table below.

## Key Design Parameters

	Pre-feasibility Study (2015)	Feasibility Study (ongoing)
Run-of-Mine feed (tonnes per year)	500,000	1,000,000
Head grade (TREO - %)	1.6	1.5
Flotation concentrate grade (TREO - %)	4.7	15.0
Concentrate recovery (TREO - %)	67	74
Flotation upgrade	3x	10x

Mass pull (% of RoM feed)	23.1	7.4
Hydromet plant feed (tonnes concentrate per year)	115,250	74,000
Rare earths in hydromet feed (tonnes TREO per year)	5,360	11,100

1 TREO - total rare earth oxides

The ongoing feasibility study envisages doubling the scale of the mining and processing operations at Songwe to one million tonnes per year of RoM feed to the mill. Due to the higher flotation concentrate grade, there would be 36% less tonnes of concentrate entering the hydrometallurgy plant, containing approximately double the quantity of rare earths, versus the pre-feasibility study. The results of the pilot programme, together with variability and other batch scale flotation test work, will be used to determine the flotation parameters over the life of the mine.

The development of the optimised flotation regime is underpinned by a significant amount of mineralogy, comminution and flotation test work undertaken at commercial laboratories in Australia, South Africa, Canada and the United Kingdom, as well as three PhD research projects undertaken at Camborne School of Mines, United Kingdom. Not only has this international effort delivered a significantly improved flotation regime for Songwe, but it has led to a greater understanding of the mineralogy, geometallurgy and beneficiation processes for primary carbonatite hosted rare earth deposits.

#### Flotation Pilot Plant Operations

Pilot plant operations were conducted over a seven day period. The first three days were operated on a day shift only, with results collected during the day's shift to be analysed and assessed overnight in order to optimise conditions and make any adjustments for the next day of operation. The pilot plant was operated continuously for the last four days with relatively stable conditions.

Several different sets of data were collected during the pilot plant trial, which were used for the assessment of concentrate grade and recovery:

- Control Samples: Grab samples typically taken every three to four hours during the trial on major streams. These results were used to control the circuit and make necessary changes to optimise the circuit performance.
- Shift Composites: Multiple samples taken of major streams composited together over each nominal 12 hour shift.
- Surveys: Multiple samples taken of every stream in the plant over a one to two hour period of stable operation. This data typically represents optimised results and allows a full circuit mass balance to be conducted.
- Timed final concentrate: The final concentrate was collected into 200 litre drums at timed intervals, nominally every three hours, and separated, filtered, sampled and assayed. This enables a recovery to be calculated by dividing the concentrate REO units by the feed REO units over the same time period.

Scientific and technical information contained in this release has been approved and verified by Nicholas Dempers Pr.Eng (RSA) Reg. No 20150196, FSAIMM of SENET (a DRA Global Group Company), who is a "Qualified Person" in accordance with National Instrument 43-101 -- Standards of Disclosure for Mineral Projects.

#### About Mkango

Mkango's corporate strategy is to develop new sustainable primary and secondary sources of neodymium, praseodymium, dysprosium and terbium to supply accelerating demand from electric vehicles, wind turbines and other clean technologies. This integrated 'mine, refine, recycle' strategy differentiates Mkango from its peers, uniquely positioning the Company in the rare earths sector.

Mkango is developing the 51% owned Songwe Hill rare earths project in Malawi with the ongoing Feasibility Study funded through a \$12 million investment by strategic partner Talaxis Limited. Malawi is known as "The Warm Heart of Africa", a stable jurisdiction with existing road, rail and power infrastructure, and new infrastructure developments underway. Following completion of the Feasibility Study, Talaxis has an option

to acquire a further 26% interest in Songwe by arranging financing for project development including funding the equity component thereof.

In parallel, through its 75.5% interest in Maginito Limited ([www.maginito.com](http://www.maginito.com)), Mkango is developing green technology opportunities in the rare earths supply chain, encompassing neodymium (NdFeB) magnet recycling as well as innovative rare earth alloy, magnet and separation technologies, and recently invested in UK rare earth (NdFeB) magnet recycler, HyProMag Limited ([www.hypromag.com](http://www.hypromag.com)).

Maginito's strategy is underpinned by offtake rights for sustainably sourced primary and secondary raw materials from Songwe and HyProMag, respectively, and is geared to accelerating growth in the electric vehicle sector, wind power generation and other industries driven by decarbonization of the economy.

Mkango also has an extensive exploration portfolio in Malawi, including the recently announced Mchinji rutile discovery, for which assay results are pending, in addition to the Thambani uranium-tantalum-niobium-zircon project and Chimimbe nickel-cobalt project.

For more information, please visit [www.mkango.ca](http://www.mkango.ca).

#### Market Abuse Regulation (MAR) Disclosure

Certain information contained in this announcement may have been deemed inside information for the purposes of Article 7 of Regulation (EU) No 596/2014 until the release of this announcement.

#### Cautionary Note Regarding Forward-Looking Statements

This news release contains forward-looking statements (within the meaning of that term under applicable securities laws) with respect to Mkango, its business and the Project. Generally, forward looking statements can be identified by the use of words such as "plans", "expects" or "is expected", "scheduled", "estimates" "intends", "anticipates", "believes", or variations of such words and phrases, or statements that certain actions, events or results "can", "may", "could", "would", "should", "might" or "will", occur or be achieved, or the negative connotations thereof. Readers are cautioned not to place undue reliance on forward-looking statements, as there can be no assurance that the plans, intentions or expectations upon which they are based will occur. By their nature, forward-looking statements involve numerous assumptions, known and unknown risks and uncertainties, both general and specific, that contribute to the possibility that the predictions, forecasts, projections and other forward-looking statements will not occur, which may cause actual performance and results in future periods to differ materially from any estimates or projections of future performance or results expressed or implied by such forward-looking statements. Such factors and risks include, without limiting the foregoing, governmental action relating to COVID-19, COVID-19 and other market effects on global demand for the metals and associated downstream products for which Mkango is exploring, researching and developing, the positive results of a feasibility study on the Project and delays in obtaining financing or governmental or stock exchange approvals. The forward-looking statements contained in this news release are made as of the date of this news release. Except as required by law, the Company disclaims any intention and assumes no obligation to update or revise any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by applicable law. Additionally, the Company undertakes no obligation to comment on the expectations of, or statements made by, third parties in respect of the matters discussed above.

For further information on Mkango, please contact:

#### [Mkango Resources Ltd.](http://www.mkango.ca)

William Dawes

Chief Executive Officer

[will@mkango.ca](mailto:will@mkango.ca)

Canada: +1 403 444 5979

[www.mkango.ca](http://www.mkango.ca)

@MkangoResources

Alexander Lemon

President

[alex@mkango.ca](mailto:alex@mkango.ca)

Blytheweigh

Financial Public Relations

Tim Blythe

UK: +44 207 138 3204

SP Angel Corporate Finance LLP

Nominated Adviser and Joint Broker

Jeff Keating, Caroline Rowe

UK: +44 20 3470 0470

Alternative Resource Capital

Joint Broker

Alex Wood

UK: +44 20 7186 9004

Bacchus Capital Advisers

Strategic and Financial Adviser

Richard Allan

UK: +44 20 3848 1642

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