

Jangada Mines plc / EPIC: JAN.L / Market: AIM / Sector: Mining

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Jangada Mines plc ('Jangada' or 'the Company')

Investee Company Update: Fodere Titanium

Commercialising technology that extracts critical minerals from mine tailings & primary feedstocks

Jangada Mines plc, a natural resources development company with interests in Brazil and elsewhere, is pleased to announce an update on critical mineral extraction technology company, Fodere Titanium Limited ('Fodere'), in which it holds a 7.7% interest.

Highlights on the Fodere developments:

- Groundbreaking extractive technology proven at pilot level in Zambia.
- Technology enables the recovery of 99% of minerals from various tailings feedstocks in a single process, significantly reducing operational costs and benefitting the environment.
- Engineering design of a pre-commercial 7 tonne per day ('tpd') plant in South Africa to confirm scalability of the technology has commenced, with commissioning targeted for mid-2024.
- Plans for full commercial plant in place and support from an African focused development bank, which is intending to finance the initial commercial plant with an investment exceeding US\$70 million.
- Excellent economic potential for a plant to be constructed at Jangada's Pitombeiras vanadium titanomagnetite project in Brazil ('Pitombeiras').
- Early testing of Pitombeiras ore delivered high recovery levels including 86.73% TiO₂, 91.19% Fe₂O₃, and 95.88% V₂O₅ (see RNS dated 13 April 2023).
- 25 tonnes of material from Pitombeiras awaiting shipment to South Africa to be tested in the pre-commercial plant.
- Jangada maintains the exclusive rights for the technology in South America.

Brian McMaster, Executive Chairman of Jangada said,*"Fodere continues to make excellent progress as it looks to advance its groundbreaking technology that extracts critical minerals from mining waste dumps and primary materials, specifically vanadium and titanium. It has the potential to extract high-grade titanium dioxide and vanadium pentoxide from our own Pitombeiras vanadium titanomagnetite project in Brazil and greatly improve the already robust economics of the Project. With the exclusive rights to South America, it also provides us with potential for additional revenue through other opportunities, particularly waste dumps. We have an excellent network in South America which we aim to utilise to enact this process.*

"I look forward to updating investors regularly on all our projects and acquisition strategy as we look to build long term value for shareholders."

Operational Overview from John Omitogun, Director of Fodere:

"We are pleased to provide you with an update on the progress Fodere is making as we look to execute our strategy. Our focus remains to delivering our first commercial critical minerals processing plant utilising our groundbreaking proven technology, which, as you know, extracts critical minerals, such as titanium & vanadium from primary ores, along with tailings stockpiles. This, in essence, turns environmental liabilities into revenue generating assets.

"Over the past months, we have been working to implement technical enhancements to ensure the technology is commercially scalable. Ahead of the next investment tranche and in conjunction with our engineering team, we have analysed the design specifications and identified areas to optimise the process and improve the economics. While these modifications necessitated extra time and resources, we are confident that they will

prove to be a worthwhile investment.

"Our previous small-scale pilot plant operations have demonstrated the success of our technology. In light of recent optimisations and the need to thoroughly examine technical intricacies associated with scaling, we've made the strategic decision to construct an intermediate-sized pre-commercial facility in South Africa, strategically located near the 12 million tonnes of feedstock which we currently control. The establishment of this facility is essential for gaining a comprehensive understanding of all intricacies through the operation of a pre-commercial plant before progressing to a larger industrial-scale commercial facility."

"The pre-commercial plant serves a dual purpose. Firstly, it will provide valuable insights that significantly reduce uncertainties related to scaling up, paving the way for the construction of a much larger commercial plant than initially planned. Secondly, it will serve as a testing ground for a diverse range of feedstocks, offering opportunities for training large plant operators and potential future licensees. It is important to emphasise that we maintain unwavering support from an African focused development bank, which is intending to finance the initial commercial plant in South Africa with an investment exceeding US\$70 million."

"We are also pleased to announce that detailed engineering is underway for the pre-commercial plant. This facility will have a fully integrated semi-continuous design, capable of handling 7 tons per day of feedstock. Costing US\$2.5 million, this pre-commercial-sized plant is on track to be commissioned and fully operational in 2024. It marks a pivotal milestone in our journey towards realising our objectives of achieving commercial viability and profitability."

"We would like to emphasise the effectiveness of our technology in today's world. As a disruptive sustainable solution, it enables the extraction of 99% of minerals from various feedstocks through a single process, all while adhering to a zero-waste policy. This aligns well with the preferences of potential end users. The growing emphasis on Environmental, Social, and Governance (ESG) considerations, coupled with the increasing demand for environmental solutions to manage tailings and process primary materials, especially with regard to minimising water and power consumption, has led to a heightened interest in our technology."

"As we progress with our initiatives, it is essential to initiate a capital raising effort to address the financial shortfall for the pre-commercial plant. The board is proactively involved in discussions with potential investors to secure the necessary capital."

Further Information:

Jangada's original investment in Fodere was made as part of the Board's strategy to utilise its strong treasury and expand its exposure to commodities and technologies focussed on net zero strategies in the natural resources arena. The Company also has a 10% interest in Blencowe Resources, which provides exposure to graphite, the largest commodity within an EV battery.

Fodere has spent seven years developing its technology and invested in excess of US\$9.2m; with the latest funding round implying a valuation post money of US\$30m. Its 11-strong technical team, led by co-inventors Dr Yotamu Hara and Dr Stephen Parirenyatwa, have years of collective experience in engineering, design, metals processing, project management, and operations providing them with the capability to refine and commercialise this groundbreaking technology.

Fodere's pilot-plant proven technology can extract critical minerals, including titanium and vanadium, from a variety of mineral and industrial waste feedstocks to turn environmental liabilities into revenue generating assets. This unique, zero-waste solution recycles 80% of all water and operates at under 850 degrees centigrade, which is significantly lower than traditional processing plants that are typically at 1,100 degrees centigrade. With a less complex flowsheet, the process can deliver increased energy efficiencies and provide lower capital and operating expenditure compared to other conventional processing methods.

The goal of the pre-commercial plant is to provide scaled up engineering data that will facilitate the final design and costing for the first full-scale commercial treatment plant. In the future, it will become Fodere's main R&D facility allowing it to evaluate a wide variety of feedstocks while also providing training capabilities for large plant operators and any potential future licensees.

On expected success of the pre-commercial plant, Fodere aims to commence the engineering of Phase 1 of its full-scale 720,000 tonne per annum ("tpa") plant in Q4 2024 located in the Witbank region of South Africa. Witbank's Environmental Impact Assessment was approved in 2022 and +25 years of titanium and vanadium

Witbank's Environmental Impact Assessment was approved in 2022 and 120 years of titanium and vanadium rich feedstock has been secured. Letters of Interest have also been received from two major pigment producers for offtake agreements.

The plant at Witbank will be constructed in two phases. Phase 1 will have a 120,000 tpa processing capacity. The 12 million tonnes of feedstock already secured is estimated to garner annual production of 36,000 tonnes of titanium dioxide, 1,000 tonnes of vanadium pentoxide, 14,000 tonnes of alumina and 12,000 tonnes of magnesium. Ratios of product to input slag are very favourable with breakeven at 40% of forecast capacity translating into a low-cost, economically viable operation with a rapid payback.

Phase 2 will have a targeted processing capacity of 600,000 tpa, five times more feedstock per annum than Phase 1. Depending on market demand, annual production is estimated to be 192,000 tonnes of Titanium Dioxide, 5,000 tonnes Vanadium Pentoxide, 52,000 tonnes of Magnesium and 61,000 tonnes of Alumina. Preliminary funding discussions have commenced with export credit agencies that understand the environmental and financial benefits of the technology, as well as the abovementioned African focused development bank. Funding discussions on the commercial plant are subject to, inter alia, definitive documentation being agreed.

Jangada aims to utilise Fodere's technology to improve the economic potential of Pitombeiras. Encouragingly and as reported, initial test work on five samples delivered high recovery levels including 86.73% TiO₂, 91.19% Fe₂O₃, and 95.88% V₂O₅ (see RNS dated 13 April 2023).

Material totalling 25 tonnes from Pitombeiras is awaiting shipment to be tested in the pre-commercial plant. This will enable the team to finalise a commercial flowsheet and provide in-depth economics for a Preliminary Economic Assessment focussed on the extraction of TiO₂, V₂O₅ and iron. The material is awaiting permits for it to be shipped from Brazil to South Africa; Fodere is currently finalising the relevant permits.

Beyond the potential transformative benefits to Pitombeiras, Jangada has the rights to the technology in South America where it envisages it can be applied to waste dumps returning to Fodere's initial strategy to turn mining liabilities into assets. The Jangada team has wider experience of operating in South America and identifying assets that can be developed. Board member Luis Azevedo identified both the Pitombeiras asset as well as the Luanga PGM+Au+Ni Project for Bravo Mining Corp (TSX:BRVO).

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