**ASX Release**
**13 November 2017**

# BLACK ROCK MAHENGE GRAPHITE EXCEEDS INDUSTRY STANDARD PRODUCTS IN 300 CYCLE BATTERY TESTING

## HIGHLIGHTS

- Battery test program now past 300 cycles with a 94% recharge rate.
- Results have exceeded the recharge performance of industry standard product.
- Importantly 300 cycle benchmark is a consumer product standard, and represents a two year product life for consumer durables, with full discharge and recharge every second day.
- Data and methodology developed in the extended battery tests will be used to optimise second generation tests, further enhancing performance and stability.
- Interest from battery manufacturers is growing as a result of strong test work, with data to be made available to facilitate product acceptance in value-added battery segments.

Tanzanian graphite developer **Black Rock Mining** (**ASX:BKT)** ("Black Rock or the "Company") is pleased to announce long-term battery cycle test work, completed by an independent US ISO–compliant laboratory, on processed graphite anode product from Black Rock's Mahenge Graphite Project that has strongly outperformed a leading commercial brand in extended 300 cycle charge/discharge tests.

The results show a 94% recharge rate (commonly referred to as reversible capacity) over the period, outperforming industry standard products. Importantly, the 300 cycles test, is a benchmark for consumer products, as it represents a two year product life with an assumed full discharge and recharge cycle every second day.

**Black Rock's Executive Director and CEO John de Vries commented:**

*"To achieve a 94% recharge rate at 300 cycles on the first attempt to build a LiB battery is a remarkable result. In a market where performance is critical, Black Rock believes it is the only graphite developer to have comprehensively demonstrated product performance. We believe we simply have the best natural flake graphite, and have done the work to prove it.*

*"For Black Rock, the adoption of a long-term LiB battery cycle test program continues to validate our product, and provides a data rich starting point in our strategic objective to establish supply contracts with future customers. Feedback from existing and potential partners has been very positive, and importantly continued product development will remain a core part of our strategy and contributes towards de-risking our path to market."*


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**Issued Capital**
364m Shares
52.2m Options
9.4m Performance Rights

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**Background**

In 2016, Black Rock engaged a US ISO-*compliant* test facility to undertake spherical graphite and purification test works on its Mahenge Graphite Project Ulanzi concentrate. The spherical graphite, both surface coated and uncoated, was then used to manufacture battery cells for performance evaluation – both initial and long-term performance. Electrochemical cells in a standard industry accepted sizing, CR2016 were assembled for this purpose.

Initial cell test testing delivered excellent charge/discharge metrics with exceptionally high reversible capacity of 371.28 mAh and highly lucrative, reduced BET and low irreversible capacity losses (8.35% and 5.61% for the uncoated and coated versions of spherical graphite, respectively).

The ongoing long-term electrochemical tests have enhanced the initial results, and generated insights into specific electrolyte and coating formulations specific to Mahenge. In over 300 charge/discharge cycles, Black Rock's test cells demonstrated consistently higher discharge capacity and flatter performance curves than a leading coated spherical graphite used as a comparison. This is believed to occur due to the thicker Mahenge graphite flakes which are more stable in cell use than thin flakes. We hypothesize that the primary reason for observed increased stability of Mahenge flake on a backdrop of thinner flake controls is due to ability of thicker flake to better withstand matrix volume changes associated with intercalation and de-intercalation of lithium ions.

The cell test trials used several variations in the composition of anode/binder/additives/electrolyte and cell construction method, hence the different performance curves for the test cells in Figure 1. Also, Figure 1 shows two competitive long-term cycling curves from a leading graphite supplier. Both curves show the performance of a surface coated, spheroidized natural crystalline flake graphite of high purity level. The key result from the long-term testing is that Mahenge test cells have flatter sloping performance curves than a leading commercial SPG, indicating potential for longer cycle life.

Passing the 300 charge/discharge cycle is an important milestone. The 300 cycle test, is a common test for consumer durable goods, for example a two-year mobile phone contract with the phone being run fully flat and recharged every second day.

The long-term cell testing builds upon the successful spherical graphite and purification test work showing that the Mahenge Graphite Project spherical graphite has unique positive physical features with potential to improve the stability, LiB battery safety performance and enhance the cycle life of lithium-ion batteries.

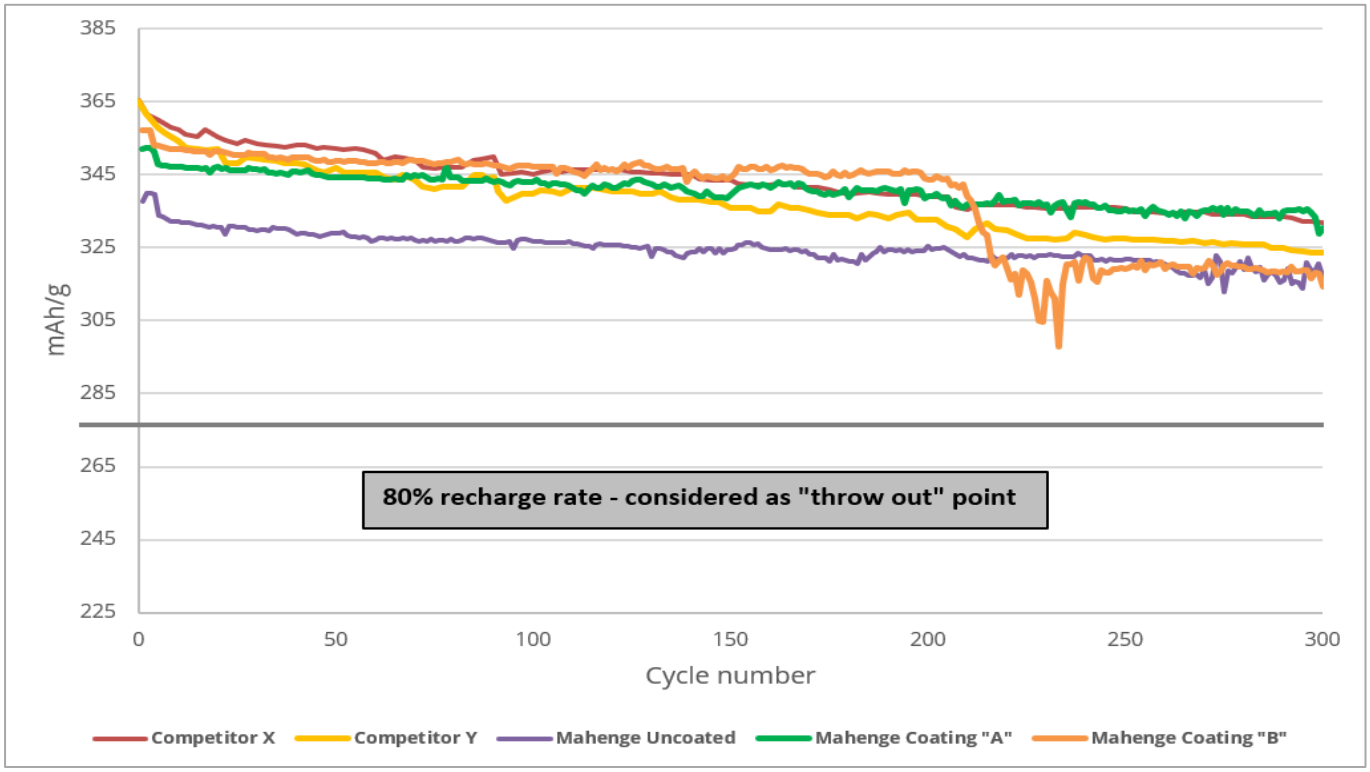


**Figure 1: Graph of 300 cycle testing comparing Black Rock's Mahenge graphite performance with industry standards**

Importantly, Black Rock believes it is leading the graphite industry in recognising the importance of the use of long-term cycling data to characterise the sustainability of LiB battery performance with the Company's graphite. Long-term cycling is a pivotal performance characteristic within the LiB battery industry, and the Company's electrochemical testing will provide guidance on anode binders, electrolyte composition and anode construction methods used in the test cells. This information is available for LiB battery manufacturers.

**For more information:**


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**About Black Rock Mining**

Black Rock Mining Limited is an Australian-based company listed on the Australian Securities Exchange. The Company owns graphite tenure in the Mahenge region of Tanzania.

The Company announced a JORC compliant Mineral Resource Estimate of 211.9m tonnes at 7.8% TGC for 16.6m tonnes of contained Graphite, making the Mahege Graphite Project one of the largest JORC compliant flake graphite Mineral Resource Estimates globally. Over 50% of the Mineral Resource is in the Measured and Indicated categories. In April 2017, Black Rock announced results of a Preliminary Feasibility Study (PFS) for its Mahenge Graphite Project which confirmed its potential as a long-life, low capex, high margin operation.

The PFS estimated a post-tax, unlevered, internal rate of return ("IRR") for the Project of 45.1%; and a net present value (NPV) using a discount rate of 10% ($NPV_{10}$) of US$905m. Black Rock confirms, that except for the proposed legislative changes relating to 16% free carry position of the Tanzanian Government and the royalty fee increasing to 4.3%, the key assumptions used in the PFS have not materially changed and that the material assumptions continue to apply per the PFS announcement released to the ASX on 24 April 2017. Subject to clarification on Tanzanian legislative changes, Black Rock is moving towards commencing a Definitive Feasibility Study (DFS). With a successful DFS and associated financing, construction could commence in 2018 with first production in 2019.

For further information on the company's development pathway, please refer to the company's website at the following link: http://www.blackrockmining.com.au and the corporate video presentation at http://www.blackrockmining.com.au/#video.

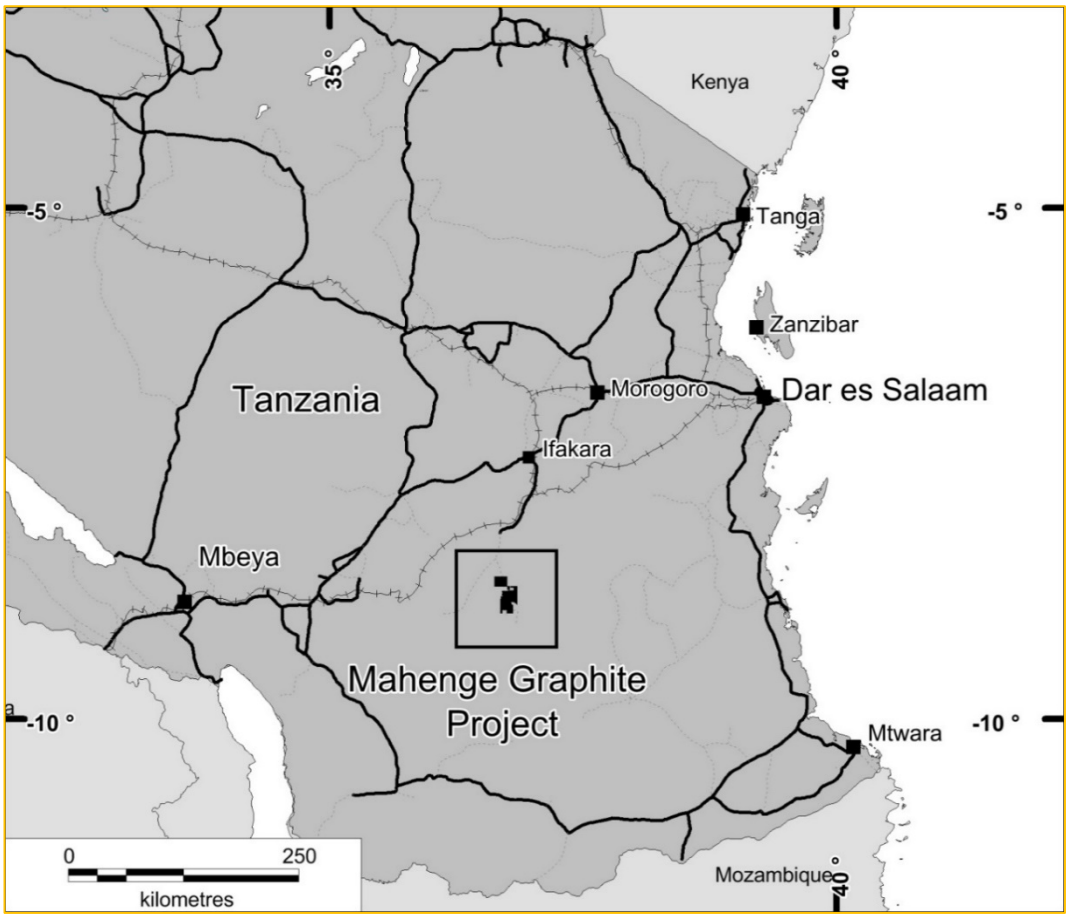


**Figure 2: Location of Black Rock's Mahenge Graphite Project within Tanzania**