ASX: EV1 | 21 July 2022

ASX ANNOUNCEMENT

Long-term battery cycling of coated spherical graphite maintains exceptional electrochemical performance

HIGHLIGHTS

- **Evolution has been undertaking a commercial verification program with an established US manufacturer of battery graphite products to evaluate the amenability of Chilalo graphite to producing coated battery anode materials using thermal purification and proprietary coating technologies.[1]**
- **Preliminary cycle testing undertaken to gauge degradation of electrochemical performance of uncoated and coated spherical graphite maintain a near-theoretical electrochemical performance at a reversible capacity of 368 mAh/g[2].**
- **Chilalo spherical graphite easily exceeds the thresholds required by super-premium graphite in the EV and energy storage anode applications.**
- **Cycle testing will continue through to 100 cycles, whilst the Company has sufficient data to commence qualification initiatives of coated spherical graphite with targeted battery manufacturers.**

Evolution Energy Minerals ("Evolution" or the "Company") (ASX: EV1, FSE: P77) is pleased to report the preliminary results of long-term battery cycling undertaken by the Company's US technology partner. This is the latest stage in the testwork process that has already demonstrated that Chilalo fines have very low levels of Molybdenum and Boron, can be purified to 99.9995% C and when processed into coated spherical graphite, significantly exceeds the specifications of major EV manufacturers.

Short-term electrochemical testing has previously demonstrated that the uncoated Chilalo spherical graphite delivered a reversible capacity of 367.65 mAh/g with an irreversible capacity loss of 9.4%. The surface coated version of the same material preserved the reversible capacity level, demonstrating 367.8 mAh/g, while decreasing irreversible capacity loss to <7%[3].

In this current testwork stage, the uncoated and coated spherical graphites were tested in a cell design engineered for long-term cycling. The testing, which seeks to verify whether the reversible capacity holds from cycle to cycle, is continuing. Evaluation will gauge the degradation of electrochemical performance as a function of elapsed cycle number.

Cycling is performed in CR2016 coin cells, a generally accepted test vehicle for pre-qualifying graphite for use in lithium-ion battery anodes. Cycling is performed at a C/10 rate, meaning that it takes ten hours to charge the cell and the same to discharge. Therefore, one full cycle lasts approximately one day. As cycling just recently started, the Company is pleased to report the performance of the first twenty cycles, with more updates to follow.

Phil Hoskins, Managing Director of Evolution, commented, "*We are extremely pleased to have started our long-term battery cycle testing program for Chilalo's coated spherical graphite. Tests use industry standard CR2016 battery cells, and the results we are seeing to date are very encouraging.*

"The surface coated graphite grade that is being tested has a mean particle size of 25 microns, which meets the specifications of at least one leading electric vehicle manufacturer and at least one world-class battery technology provider for lithium-ion cells used in utility-scale energy storage. We will work with these companies as intended offtake partners in the future and will be updating the market as more test data becomes available."

[1] For further information on Evolution's sustainable battery anode materials strategy, see previous ASX announcements on 14 February 2022, 6 July 2022, 12 July 2022 and 18 July 2022.
[2] mAh/g = Specific capacity rating of the battery in milliampere hours (mAh) per gram of anode material.
[3] See ASX announcement dated 18 July 2022.

Figures 1 and 2 below showcase galvanostatic cycling curves on the first, tenth, and twentieth cycle, as well as an all-cycle overlay summary for the uncoated and surface-coated spherical graphite from Chilalo, respectively. It is evident that both the uncoated and coated spherical graphite deliver and maintain a near-theoretical electrochemical performance at a reversible capacity level of 368 mAh/g.

For reference, the theoretical capacity of graphite is 372 mAh/g, and many argue that it is nearly impossible to reach this level without specialised testing. Clearly, Chilalo flake comes extremely close to the theoretical capacity in a robust cell design employed in the testwork.

For comparison, the majority of standard-grade lithium-ion battery manufacturers accept spherical graphite as suitable for application in anodes when their reversible capacity is greater than 350 mAh/g. Super-premium graphite must deliver over 360 mAh/g which, if achieved, is suitable for the electrical vehicle and environmentally responsible energy storage markets.

Chilalo's spherical graphite easily meets and exceeds both thresholds. Moreover, super-premium battery applications require irreversible capacity loss below 7%, which at 6.95%, Chilalo's surface coated spheroidal graphite achieves. The super-premium class of active anode materials sells for U$18,000 to $22,000 per tonne.

Figure 1: Galvanostatic cycling curves on the first, tenth, and twentieth cycle, as well as an all-cycle overlay summary for Chilalo uncoated spherical graphite (C/10 cycling rate, CR2016 cell)

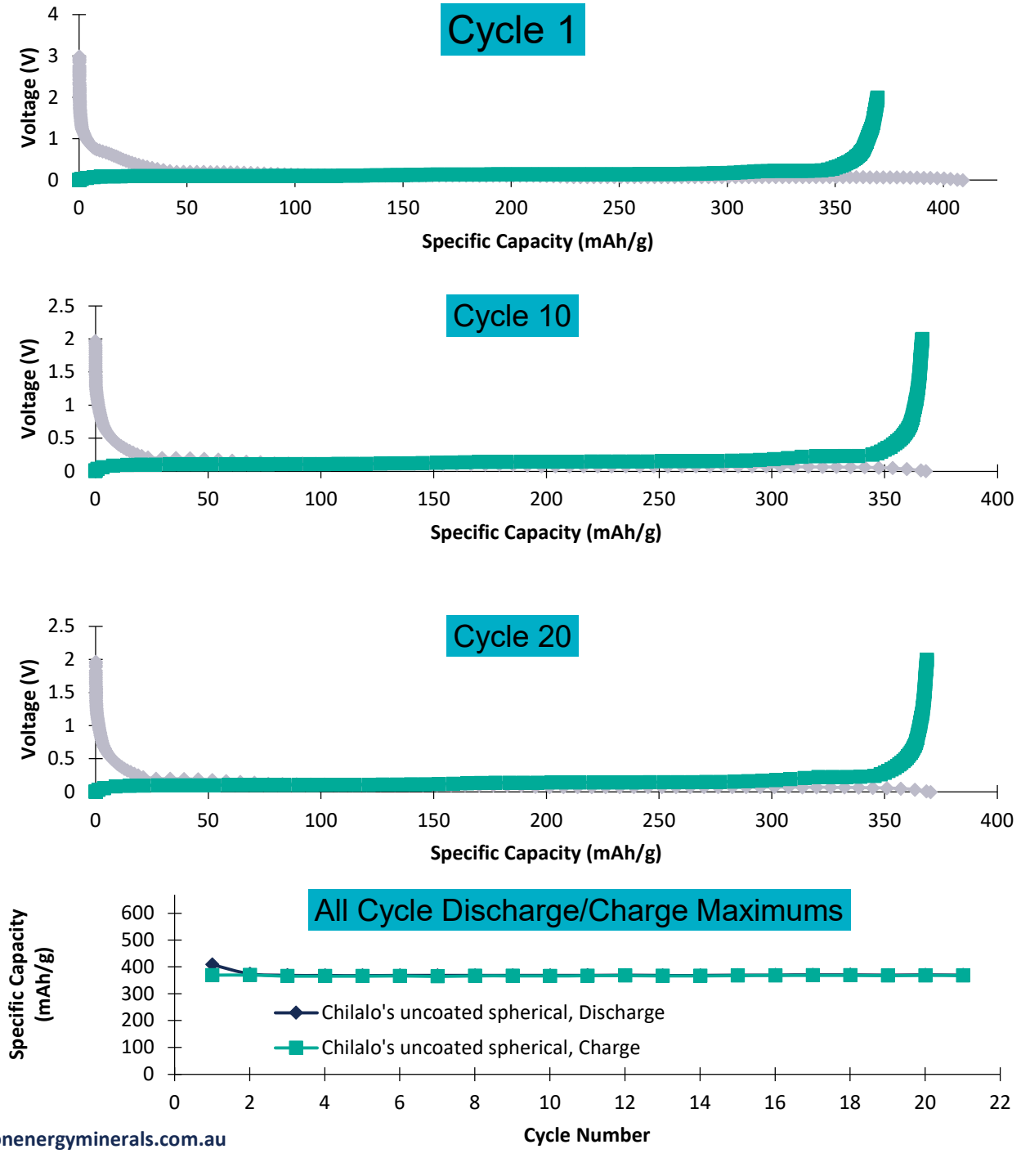
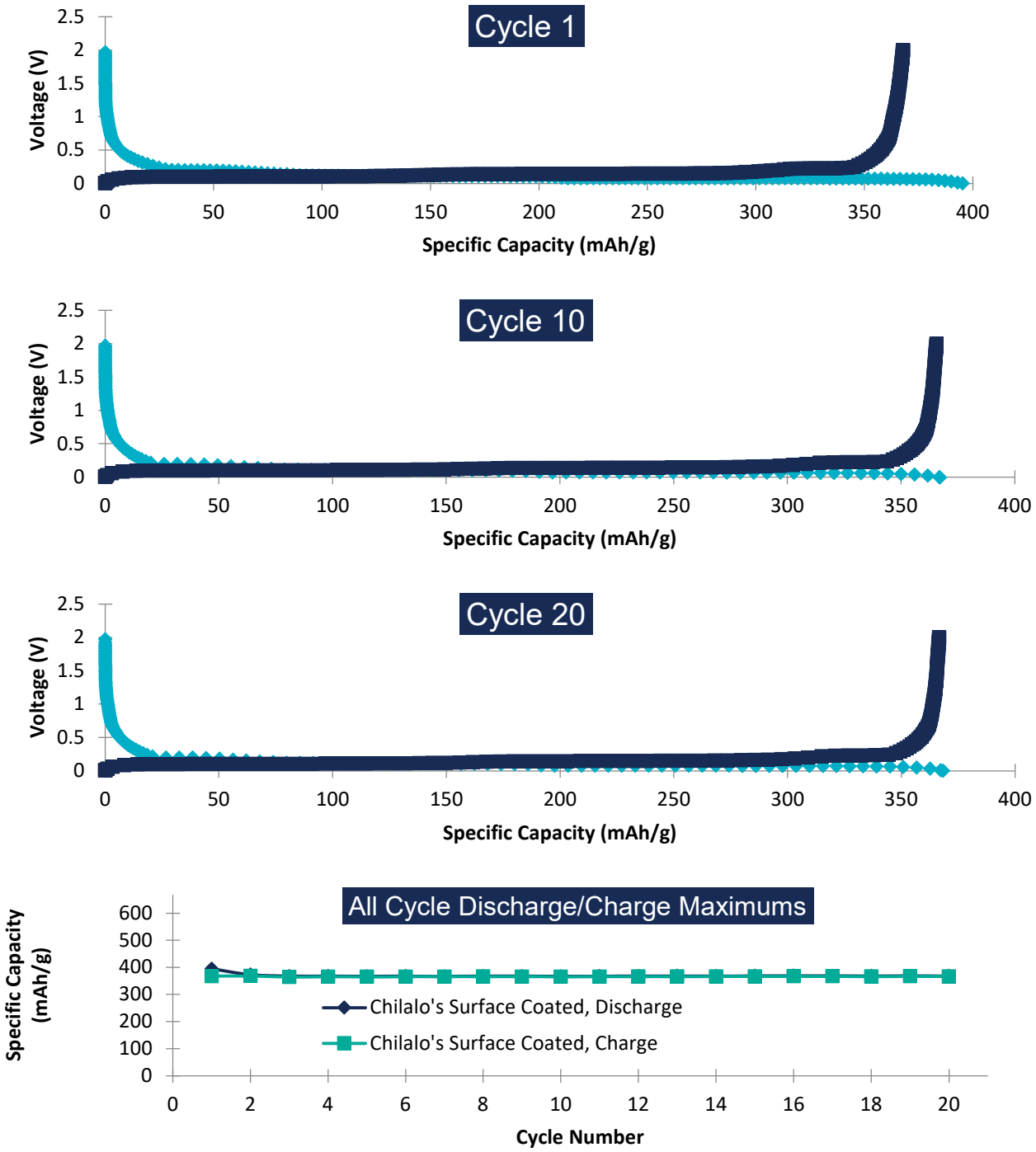


Figure 2. Galvanostatic cycling curves on the first, tenth, and twentieth cycle, as well as an all-cycle overlay summary for Chilalo coated spherical graphite (C/10 cycling rate, CR2016 cell)



Next steps

Cycling tests will continue to be performed until 100 cycles have been completed, over a period of 2-3 months. At this point, long-term cycling performance can be extrapolated.

Sufficient data has already been collected from the commercial verification program undertaken by the Company's US technology partner to commence qualification initiatives of coated battery anode materials with targeted battery manufacturers. The flowsheet adopted by Evolution and its US technology partner is attached as Appendix A.

Testwork is ongoing on the purified, non-spherical by-product that did not qualify as usable spheres for battery anode materials, in order to determine suitability for use as a high-value conductivity enhancement in alkaline battery cathodes. Achieving a high-value commercial application of the non-spherical by-product would substantially improve the economics of the potential downstream battery anode materials plant.

This announcement has been approved for release by the Evolution board of directors.

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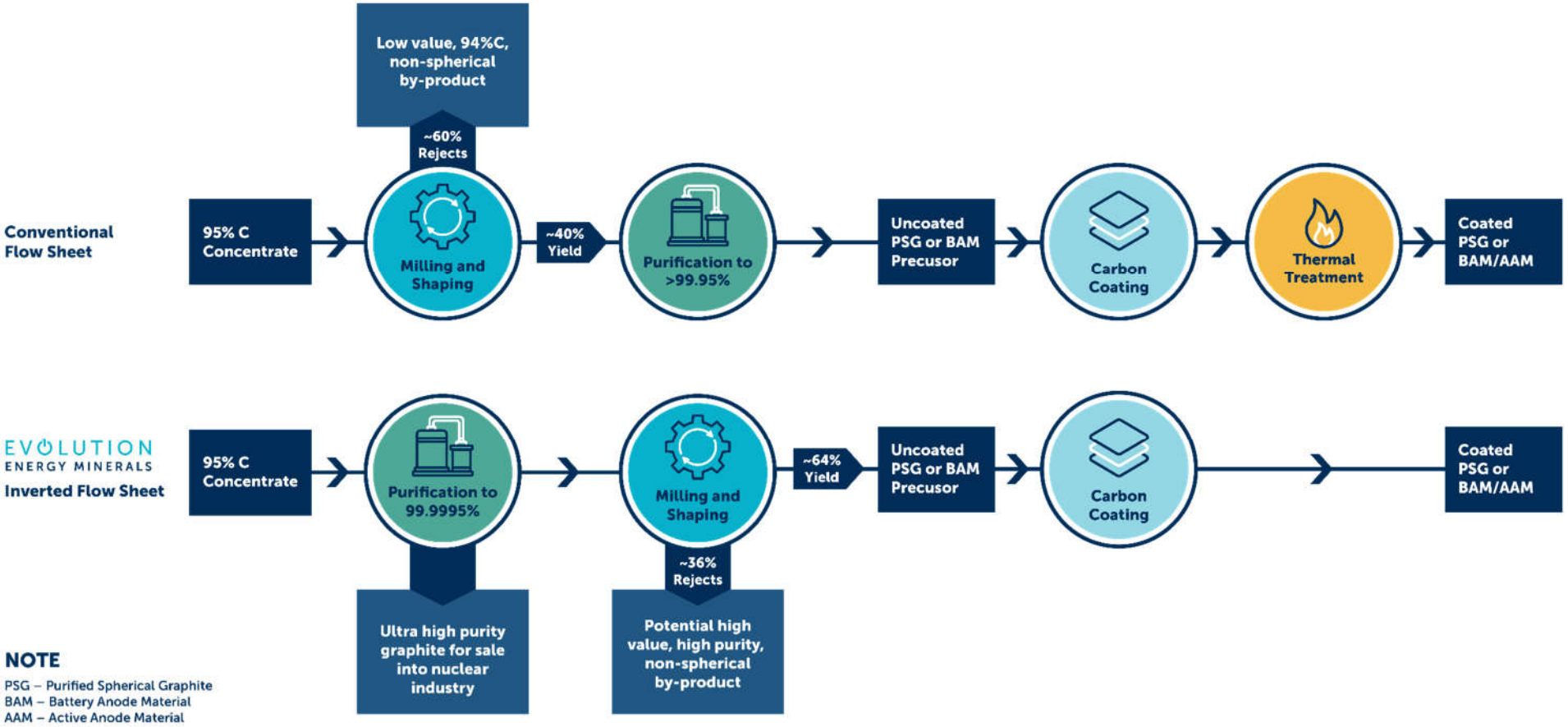
Appendix A: Evolution's flow sheet to produce battery materials compared to conventional flow sheet



ABOUT EVOLUTION (ASX:EV1)

Development ready
Chilalo Graphite Project in Tanzania

58% > 80 Mesh
World leading flake size = highest margins

Extensive product qualifications
Will result in quality offtakes and technology partnerships

Framework agreement
To provide Tanzanian government certainty

FID by H2 2022
Strategic ESG fund cornerstone support

Sustainable battery anodes
Non-HF, thermal puification program completed Q3

Carbon neutrality
Pursuing net zero carbon from day one

Evolution's vision is to become a vertically integrated company that will only supply sustainably sourced graphite products and battery materials.

This will be achieved by combining our unique graphite source with industry-leading technology partners, working closely with customers and producing diversified downstream products in both Tanzania and strategically located manufacturing hubs around the world. Evolution is committed to being global leaders in ESG and ensuring its operations support the push for decarbonisation and the global green economy.

EVOLUTION ENERGY MINERALS

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