



ASX ANNOUNCEMENT | 2 November 2023

## KASIYA LITHIUM-ION BATTERY GRAPHITE PROGRAM SIGNIFICANTLY UPSCALED

- Bulk sampling program underway at Kasiya to extract 100 tonnes of ore to produce over 1,000kg of natural graphite for lithium-ion battery anode testwork and product qualification
- The upscaled graphite qualification program will support upcoming project studies with our strategic partner, Rio Tinto
- Sovereign and Rio Tinto have agreed to collaborate to qualify graphite from Kasiya, with a particular focus on supplying the spherical purified graphite (SPG) segment of the lithium-ion battery anode market
- Previous testwork confirmed Kasiya's graphite to have near perfect crystallinity and high purity – both key attributes for suitability in lithium-ion battery feedstock
- Kasiya's recent Pre-Feasibility Study (PFS) confirmed it could be one of the world's largest natural graphite producers at 244kt per annum with the lowest cash operating costs globally at US\$404/t and the lowest CO<sub>2</sub>-footprint
- As one of the largest known natural graphite deposits globally, close to existing infrastructure connecting it to global markets, Kasiya is set to become a strategic source of long term, secure supply outside of China
- This graphite qualification program coincides with news of China's curbs on exports of natural graphite, a critical mineral for the US, EU, Japan and Australia

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Sovereign Metals Limited (ASX:SVM; AIM:SVML) (the Company or Sovereign) is pleased to announce that a bulk sampling program to extract over 100 tonnes of ore from Kasiya is underway. The bulk sampling program is part of the Company's graphite bulk sample program for qualification, downstream testwork and product development. A major component to graphite sales agreements is customer qualification with graphite produced from this program to be shared with prospective end-users in addition to being used for upscaled downstream test-work.

The Company's upscaled graphite program comes as China implements curbs on exports of natural graphite under "national security" concerns. Kasiya is one of the world's largest natural graphite deposits outside of China and has the potential to become a key source of strategic supply to the US, UK, EU, Japan and South Korea. According to industry experts Benchmark Mineral Intelligence, China currently produces 61% of all flake graphite used in the production of lithium-ion battery anodes and accounts for 93% of all graphite anode production globally.

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The recently released PFS confirmed Kasiya as a potential major critical minerals project with an extremely low CO<sub>2</sub>-footprint delivering significant long-term volumes of natural rutile (the highest-grade, purest, natural titanium feedstock) and graphite (a key component of an electric vehicle battery) while generating significant economic returns. Both titanium and natural graphite are critical to several of the world’s economies as well as crucial to decarbonisation solutions required to meet “Net-Zero” and other targets set by policymakers.

## BULK SAMPLING PROGRAM

The mechanised drill program will use a custom-made 300mm diameter spiral auger to extract over 100 tonnes of material from across Kasiya’s planned future pits with sampling to a maximum 20m depth (Figure 1).

The sampling program forms part of the Company’s program for graphite qualification, downstream testwork and product development, and is designed to produce over 1,000kg each of flake graphite and natural rutile products.

The bulk sample will be processed at the Company’s laboratory in Lilongwe, Malawi. This will be achieved with the newly installed Kwatani 30-inch single and double-deck vibrating separators for sizing and de-sliming (Figure 2). The sand fraction will then be processed over the new Holman Wilfley 2000 wet shaking table to produce a graphite pre-concentrate and a separate heavy mineral concentrate (HMC) containing the rutile (Figure 3). The graphite pre-concentrate is expected to grade 4-5% C<sup>t</sup> whilst the HMC is expected to grade ~30% contained rutile.



Figure 1. Mechanised drill with custom-made 300mm diameter spiral auger



Figure 2. Installation of the new Kwatani 30-inch single-deck and double-deck vibrating separators for sizing and de-sliming bulk samples at the Company's Malawi laboratory and metallurgical facility



Figure 3: Holman-Wilfley 2000 Series shaking table to be installed at Sovereign's Lilongwe laboratory in Malawi.

Final processing will then be completed at commercial metallurgical laboratories in Canada and Australia. The graphite pre-concentrate will undergo traditional flotation and polishing processes to target >96% C<sup>+</sup> product for lithium-ion battery anode feedstock. The HMC will undergo gravity spiral cleaner stages followed by electrostatic and magnetic separation stages to produce a +95% TiO<sub>2</sub> natural rutile products.

## PLANNED DOWNSTREAM TESTWORK

The 1,000kg of flake graphite product produced will be used for downstream test-work and initial product qualification targeting the battery anode sector. Previously reported initial characterisation testwork on Kasiya's graphite has indicated excellent suitability for use in lithium-ion batteries with very high purity and very high crystallinity being the key features.

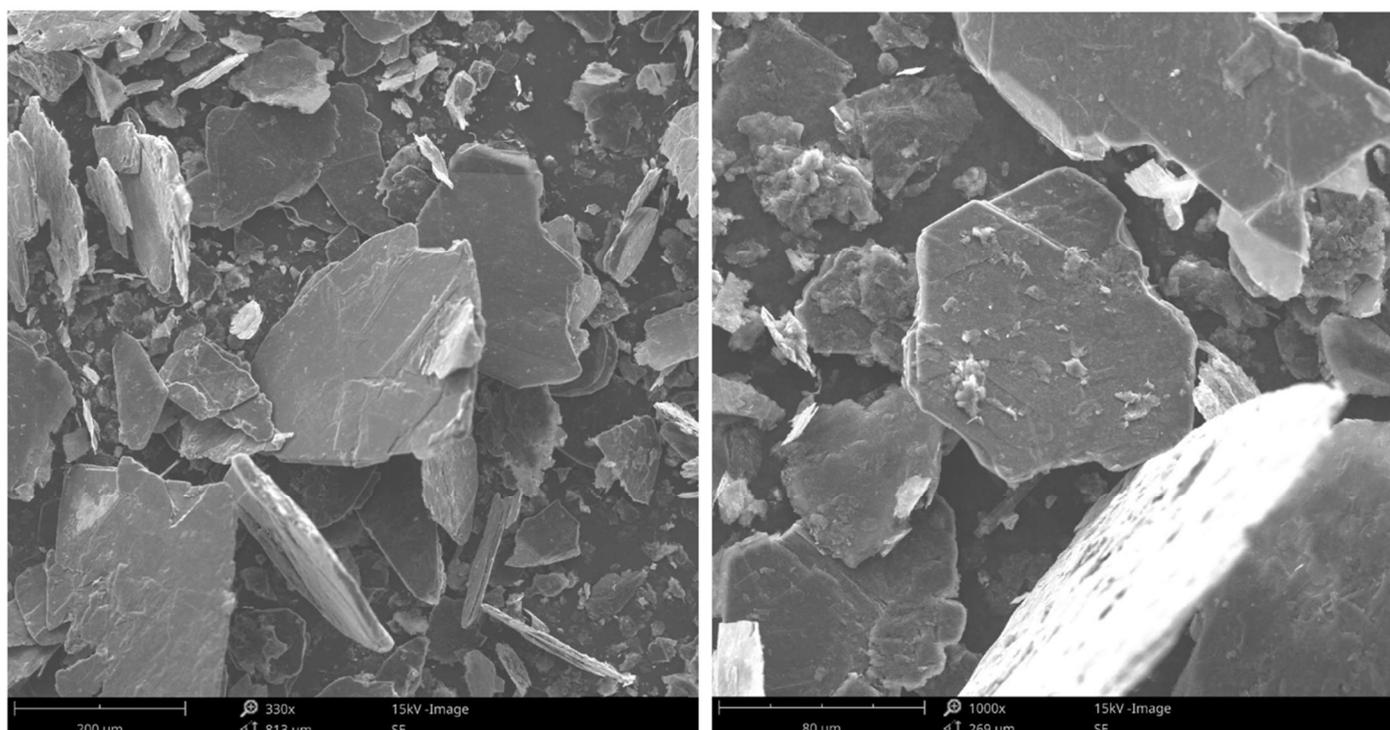
Downstream test-work and qualification on the 1,000kg flake graphite product produced will involve the following stages to be completed at recognised international battery sector laboratories;

- Purification via an optimised HF-free reagent scheme to >99.95% Ct
- Micronisation
- Spheronisation
- Carbon coating
- Anode production
- Electrochemical characterisation

Raw flake graphite products plus final CSPG (coated spheronised graphite product) will be provided to potential off-takers for assessment and pre-qualification. Through Sovereign's well-established experience in graphite, the Company has built a strong understanding of the product's market and developed relationships with well-established off-takers and customers.

A major component to graphite sales agreements is customer qualification, and this is a key reason for initiating the graphite bulk sample program and scaling up in-country facilities in order to continuously produce bulk samples. The graphite produced from this program will be shared with prospective end-users and is an important next step for Sovereign to qualify the Kasiya graphite product.

Sovereign's recent initial graphite characterisation testwork conducted by an independent German industrial minerals specialist demonstrated superior qualities and excellent suitability for its use in lithium-ion batteries. Further downstream testwork is planned that will use the graphite concentrate produced from this current bulk sampling program.



Figures 4 & 5: SEM micrograph of Kasiya graphite flotation concentrate from previous testwork

## INDUSTRY DEVELOPMENTS

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On 20 October 2023, Reuters reported, effective 1 December 2023, that China would require export permits for some graphite products including natural graphite and natural graphite products critical to EV production. China is the world's top graphite producer and exporter and also refines more than 90% of the world's graphite into the material that is used in virtually all EV battery anodes.

China's commerce ministry said the move on graphite was "conductive to ensuring the security and stability of the global supply chain and industrial chain, and conducive to better safeguarding national security and interests".

### Competent Person Statement

*The information in this announcement that relates to Production Targets, Ore Reserves, Processing, Infrastructure and Capital Operating Costs, Metallurgy (rutile and graphite) is extracted from an announcement dated 28 September 2023 entitled 'Kasiya Pre-Feasibility Study Results' which is available to view at [www.sovereignmetals.com.au](http://www.sovereignmetals.com.au). Sovereign confirms that: a) it is not aware of any new information or data that materially affects the information included in the original announcement; b) all material assumptions and technical parameters underpinning the Production Target, and related forecast financial information derived from the Production Target included in the original announcement continue to apply and have not materially changed; and c) the form and context in which the relevant Competent Persons' findings are presented in this presentation have not been materially modified from the Announcement.*

### Forward Looking Statement

*This release may include forward-looking statements, which may be identified by words such as "expects", "anticipates", "believes", "projects", "plans", and similar expressions. These forward-looking statements are based on Sovereign's expectations and beliefs concerning future events. Forward looking statements are necessarily subject to risks, uncertainties and other factors, many of which are outside the control of Sovereign, which could cause actual results to differ materially from such statements. There can be no assurance that forward-looking statements will prove to be correct. Sovereign makes no undertaking to subsequently update or revise the forward-looking statements made in this release, to reflect the circumstances or events after the date of that release.*

*This announcement has been approved and authorised for release by the Company's Managing Director & CEO, Frank Eagar.*