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GreenRoc Mining PLC
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GreenRoc Mining plc

("GreenRoc" or the "Company")

Amitsoq Update
Feasibility Study Confirms Compelling Case for GreenRoc Anode Plant
Notice of Final Results

GreenRoc Mining plc (AIM: GROC), a company focused on the development of critical mineral projects in Greenland, is pleased to announce the results of a preliminary feasibility study ("Feasibility Study") in respect of the establishment of a downstream processing plant to produce graphite active anode material from graphite concentrate produced from the Company's planned graphite mine at Amitsoq, South Greenland.

The Feasibility Study, completed with a cost accuracy to AACE Class 4, was conducted by SLR Consulting Ltd ("SLR"), an independent UK consulting firm with considerable global expertise in the field of mining and mineral processing, and was supported by a ca. £250k grant from Innovate UK's Automotive Transformation Fund.

GreenRoc also provides an update on its expected financial results for the financial year ended 30 November 2023 at the end of this RNS.

Highlights

- Pre-Tax Net Present Value at 8% discount rate (NPV_8) of US$837M with Internal Rate of Return (IRR) of 33.8%.
- After-tax NPV_8 of US$545M with IRR of 25.3%.
- Total gross revenue of US$6.5Bn over the 22-year period, with total gross profit totalling US$2.7Bn.
- Years of operation set at 22 to match that planned for the Amitsoq graphite mine.
- 4-year payback period on capital from start of production.
- Initial capital cost (Capex) of US$321M inclusive of a 25% contingency.
- Average operating cost (Opex) of US$2,211 per tonne of CSPG.
- Average annual processing of 80,000t of graphite concentrate at 95% graphitic carbon (C(g)) with production of 39,700t of active anode material in the form of coated spherical purified graphite (CSPG).

GreenRoc's CEO, Stefan Bernstein, commented:

"The Feasibility Study in respect of GreenRoc's planned downstream processing plant has delivered excellent results, with an after-tax NPV8 of more than half a billion US dollars. Having employed the industry's standard techniques and premium instrumentation where possible, we are confident of the robustness of the Feasibility Study. This view is corroborated by the inclusion of a 25% contingency which forms part of the modelled capital cost of US$321M.

"This Feasibility Study firmly places GreenRoc as one of the few contenders to supply the European EV Battery industry with domestically produced active anode material. On behalf of GreenRoc, I would like to extend our gratitude towards Innovate UK for the generous support of a £250k grant towards this Feasibility Study though its Automotive Transformation Fund.

"There are further possible improvements to the process design which we will be looking into in a second stage, commencing shortly, and we will provide updates on that in due course.

"With the already positive Preliminary Economic Assessment of the Amitsoq graphite mine and now this compelling assessment of the economics of establishing a downstream anode processing plant for our graphite, our confidence in our plans for a vertically integrated production model for Amitsoq, from mine to battery anode material production, has been greatly reinforced."

Details

The Feasibility Study was project managed by the Company and conducted by SLR Consulting Ltd with contributions from three expert consultants, namely Benchmark Mineral Intelligence, ProGraphite and Decision Risk Analytics.

A key component of Li-based batteries is the active anode material ("AAM") which is composed of graphite in the form of coated spherical purified graphite ("CSPG"). Presently, China has a near monopoly, delivering more than 90% of the world's production of CSPG. With the energy transition seeing a gradual replacement of the world's internal combustion engine vehicles with electric vehicles and a growing demand from Stationary Battery Storage Systems for solar energy farms and other uses, a 400% growth in demand for battery grade graphite is forecast by leading market analysts. There is therefore a political desire to urgently initiate production of domestically sourced and processed graphite for the European and North American battery industries.

The raw material for production of CSPG is natural flake graphite concentrate. The production of CSPG consists of a series of intermediate steps: first, the graphite concentrate is micronised to a standard particle size using a rotary impact mill. Then the graphite flake particles are introduced to a rounding impact mill or shaping mill, which turns the angular graphite flakes into rounded particles (speronized graphite). Purification then takes place via chemical leaching. In the Feasibility Study, this involved initially assessing a two-stage leaching process using a mix of hydrofluoric, hydrochloric and nitric acids to arrive at the required >99.95% purity. Finally, the spherical purified graphite (SPG) is coated with pitch and heated in kilns for about 24 hours before using high-intensity magnet separation for the removal of any impurities introduced during machining. The end-product CSPG is then sold to the battery industry to serve as AAM in lithium-ion batteries.

For the Feasibility Study, SLR has used proven state-of-the-art technology based on the use of equipment produced by Chinese manufacturers, including microniser impact mills, impact rounding mills, cyclones and air classifiers and filters, fitted with German electronic steering systems.

The processing plant will consist of 16 parallel micronisation/spheronisation lines each equipped with five microniser mills and 13 spheroniser mills. The micronisation and spheronisation circuit is designed to provide a graphite product with high tap density (close to 1.0 g/cm^3) and the ability to produce a range of characteristic particle sizes of d_{50} of 10 µm to 20 µm depending on specific settings and requirements from the battery industry.

Purification will take place in four parallel leaching lines with a final stage of coating taking place in eight parallel lines with subsequent baking in kilns and final magnetic removal of any metal particles introduced during the processing.

The Discounted Cash Flow ("DCF") model provided as part of the Feasibility Study shows a Pre-Tax Net Present Value at 8% discount rate (NPV_8) of US$837M with an Internal Rate of Return ("IRR") of 33.8%, while the After-Tax NPV_8 is US$545M with an IRR of 25.3%. The corporate tax is set at 22%, which is an average number for northern European Countries.

These NPV calculations are based on a 22-year production of 39,700t of CSPG per annum (from 80,000t of graphite concentrate at 95% graphitic carbon (C(g)), similar to the life of mine provisionally planned for the Amitsoq mine. However, as previously stated, the resource at Amitsoq could sustain a longer mine life (see the RNS of 23 January 2023). Based on 22 years of production, the total gross revenue for the anode plant has been calculated at US$6.5Bn over that period, with total gross profit totalling US$2.7Bn.

The initial capital cost is US$321M which includes a 25% contingency, while the operating cost is US$2,211 per tonne of produced CSPG. This results in a 4-year payback period on capital from

the start of production.

The DCF model is based on a forecast price for CSPG of US$7,500 per tonne and with two types of bi-product (undersize graphite material) attracting a forecast price of US$300 per tonne.

The Feasibility Study has assumed that the anode plant operation will purchase the key input raw material, graphite concentrate, at a forecast market price of US$ 1,100 per tonne. This is in keeping with the approach of carrying out the Feasibility Study for the downstream anode plant as an entirely stand-alone economic assessment, separate to the economic assessment of the Amitsoq graphite mine and primary processing plant (in relation to which, refer to the results of the Preliminary Economic Assessment released by RNS on 31 October 2023). In practice, however, the cost to the anode plant operation of the graphite concentrate feedstock is expected to be determined by the cost of production of graphite concentrate from the Amitsoq mine rather than by market prices.

One of the largest cost elements in the economic model relates to power consumption (ca. 250 GWh per annum) for all of the various stages of processing and amounts to ca. US$318 per tonne of produced CSPG which is ca. 14% of the total operating cost of US$ 2,211 per tonne of CSPG. This makes the choice of a site very important in keeping operating costs down and reducing CO_2 emissions. Accordingly, GreenRoc is reviewing several options for the location of the processing plant. The cost of labour is set at that for an average Northern European country.

In the near future, SLR will also look at an alternative purification technique using a combination of sodium hydroxide and acid mixtures other than hydrofluoric acid. Such sodium hydroxide-based purification is likely to be less expensive and have lower environmental impact and regulatory requirements than the standard hydrofluoric acid based technology. Early qualitative testwork conducted by ProGraphite on Amitsoq graphite suggests that the high purity requirement of 99.95% can be met using sodium hydroxide leaching (see the RNS of 20 January 2023). ProGraphite is currently undertaking a series of tests to constrain the use of chemicals for this purification technique, the results of which will be incorporated in an update to the Feasibility Study.

Another point of potential refinement is the costing for an onsite nitrogen gas production plant at the processing plant location. Nitrogen gas is used in the kilns where the final CSPG material is baked, hindering the oxidation (burning) of CSPG particles. In the current Feasibility Study, nitrogen gas is purchased in tanks and makes up a considerable portion of the consumables. Accordingly, a potential cost saving may be achieved by establishing local production of nitrogen gas.

With the completion of this Feasibility Study for the Anode Processing Plant, GreenRoc can now demonstrate that running a vertically integrated production of graphite anode material, based on graphite concentrate mined at the Company's planned Amitsoq mine, is a viable and potentially profitable undertaking. The next milestone with regard to the processing plant is identifying the site for the plant, and setting up a pilot scale processing plant to start the qualification process, which should lead to the signing of off-take agreements with the battery industry.

Expected Final Results

The Company expects to report a consolidated loss of £1,693,000 for the year to 30 November 2023 (2022: £1,230,000), including an exceptional £787,000 impairment charge for the surrender of the Melville Bay project, which was announced by GreenRoc on 7 February 2024. The Company expects to report year-end consolidated net assets of approximately £9,027,000 (2022: £8,965,000), comprising non-current assets of £9,741,000 and net current assets of £290,000 offset by a deferred tax liability of £1,004,000. All of the aforementioned figures for the year to 30 November 2023 are unaudited.

Greenroc expects to announce its final audited full year results for the year ended 30 November 2023 later this month.

This announcement contains inside information for the purposes of the UK Market Abuse Regulation and the Directors of the Company are responsible for the release of this announcement.

Forward Looking Statements

This announcement contains forward-looking statements relating to expected or anticipated future events and anticipated results that are forward-looking in nature and, as a result, are subject to

certain risks and uncertainties, such as general economic, market and business conditions, competition for qualified staff, the regulatory process and actions, technical issues, new legislation, uncertainties resulting from potential delays or changes in plans, uncertainties resulting from working in a new political jurisdiction, uncertainties regarding the results of exploration, uncertainties regarding the timing and granting of prospecting rights, uncertainties regarding the timing and granting of regulatory and other third party consents and approvals, uncertainties regarding the Company's or any third party's ability to execute and implement future plans, and the occurrence of unexpected events.

Actual results achieved may vary from the information provided herein as a result of numerous known and unknown risks and uncertainties and other factors.

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About GreenRoc

GreenRoc Mining plc is an AIM-quoted company which is developing mining projects in Greenland in critical, high-demand and high-value minerals. Led by a group of highly experienced mining industry professionals, GreenRoc has 100% ownership of the following high-grade critical mineral projects both of which benefit from defined Resources:

- *The **Amitsoq Graphite Project**, the Company's flagship project and one of the highest-grade graphite deposits in the world with a combined Measured, Indicated and Inferred JORC Resource of 23.05 million tonnes (Mt) at an average grade of 20.41% graphite, giving a total graphite content of 4.71 Mt; and*

- *The **Thule Black Sands Ilmenite Project** ('TBS'), which has an initial Mineral Resource of 19Mt at 43.6% Total Heavy Minerals with an in-situ ilmenite grade of 8.9%.*

Key Points about Amitsoq, GreenRoc's Flagship Asset

1. *Amitsoq is located in the Nanortalik region of southern Greenland, in year-round ice-free waters and on the same latitude as far northern Scotland.*
2. *GreenRoc is focused on fast-tracking the development of Amitsoq into a producing mine in the shortest possible timeframe to meet critical demand from Electric Vehicle ('EV') manufacturers in Europe and North America for new, high grade and conflict-free sources of graphite.*
3. *The Amitsoq Island Deposit has a total inferred, indicated and measured JORC Resource of 23.05 million tonnes (Mt) at an average grade of 20.41% Graphitic Carbon ("C(g)"), giving a total graphite*

content of 4.71 Mt. This makes Amitsoq one of the highest-grade graphite projects in the world.

4. *Significant further resource upside exists at Amitsoq as the Amitsoq Island Deposit is open in at least two directions, with potential for considerable further expansion via the similarly high-grade Kalaaq Mainland Deposit as well as a series of other high-grade targets within GreenRoc's licence package.*
5. *The Amitsoq Island Deposit was in small-scale production about 100 years ago, and there remains considerable underground mine development in place from that time, which will be of considerable benefit to GreenRoc in the mine construction phase.*
6. *In GreenRoc's test work programmes:*
   a. *Micronisation and spheronisation test work has proven that Amitsoq graphite can be readily upgraded to high-grade, anode-quality graphite, known as high purity spherical graphite or cSPG, a critical component in the Li-ion battery of an EV.*
   b. *Amitsoq spheronised graphite has achieved higher than 99.95% purity with relatively little energy input and processing and using a milder alkaline purification method compared to the industry standard hydrofluoric acid, boding well for future production costs and sustainability commitments.*
   c. *Electrochemical testing of Amitsoq graphite anode material within a test Li-ion battery cell has shown that it performs very well, in part due to its good crystallinity.*
7. *The results of a Preliminary Economic Assessment (or PEA) for Amitsoq released on 31 October 2023 give a post-tax NPV8 for the Project of US$179M, an IRR of 26.7% and capex estimated at US$131M (including a 25% contingency). These figures solely relate to the economics of a mining and primary processing operation in South Greenland and do not take into account any potential upside from a downstream processing operation which GreenRoc intends to establish in Europe or the USA.*
8. *In relation to that downstream business, GreenRoc is currently undertaking a Feasibility Study into the establishment of a graphite spheronisation processing plant to produce cSPG from graphite concentrate delivered from Amitsoq. This Feasibility Study, which is expected to be completed in H1, 2024, has been part-financed by a grant of approximately £250,000 from the UK's Automotive Transformation Fund.*
9. *Following a detailed evaluation process, the European Raw Materials Alliance has expressed its support of GreenRoc and its Amitsoq graphite project, stating that: "GreenRoc's graphite resource is of global importance and, together with the Company's strategy, will enable the European Union to achieve a certain level of independence for the electrical vehicle supply chain. ERMA has approved the Amitsoq Graphite project and will engage to support its development and financing to produce these critical raw materials for the benefit of the European Union goals." (see RNS dated 8 February 2023).*

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