

Company Announcement, 24 March 2020

## **Company Update and Outlook: Kvanefjeld EIA Studies and Updates to be Completed in March**

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- **Additional environmental impact assessment (EIA) studies by independent specialists complete**
  - **Studies support existing strategies, providing further rigour and confirm the overall assessment of impacts and risks**
  - **Specialist consultancy Shared Resources to update and integrate additional studies with the overarching EIA document**
  - **Updated EIA and additional studies to be lodged with the Greenland Government at the start of April**
  - **Additional work followed guidance from Greenland's Environmental Agency for Mineral Resource Activities (EAMRA)**
  - **Productive meetings held with Greenland's Minister for Finance and Mineral Resources, and his colleagues during PDAC conference in Toronto to fast track permitting**
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*Managing Director Dr John Mair commented:*

*"As the impacts of the current pandemic become more far-reaching, we have been working to ensure that we as a company can continue to progress key areas of focus effectively. Additional EIA related work for the Kvanefjeld Project will be completed by 31 March 2020. We have been in communication with relevant government departments in Greenland, and they are set up to operate remotely to review our EIA material and plan the next steps of the permitting process.*

*Greenland-based employees will be maintaining a steady dialogue with stakeholders via appropriate channels. The Company is fully equipped to operate remotely during the COVID19 response period, and all current work is proceeding. As always the safety and welfare of our staff and their communities is of utmost importance to us."*

**Greenland Minerals Ltd** ('GML' or 'the Company') is pleased to update on progress on permitting of the Company's 100% owned Kvanefjeld Project. Kvanefjeld, favourably located near infrastructure in southern Greenland, is one of the most significant and advanced rare earth projects globally, and is

positioned to be a low-cost, long life producer of key rare earth elements including **neodymium, praseodymium, terbium and dysprosium**.

The Company's main point of focus through early 2020 has been the completion of additional EIA related studies. Following a series of meetings with Greenland's EAMRA and their advisors through Q4 2019, independent consultants were engaged to conduct several additional studies. These studies have now been completed. The studies identified no new environmental issues and support outcomes consistent with those from prior work.

Greenland's Minister of Finance and Mineral Resources Mr Vittus Qujaukitsoq recently (as posted on Government of Greenland website, 19 March, 2020) outlined the importance of the development of a rare earth mining industry in southern Greenland for job creation and economic growth, and his anticipation of imminent permitting progress in order to see projects developed.

## **Background**

GML has been working through the permitting phase for the Kvanefjeld rare earth project. Permitting in Greenland requires three main impact assessments and supporting studies to be prepared and accepted for public consultation. These include the EIA, Social impact assessment (SIA), and Maritime Safety study. Studies undergo a detailed review process prior to being accepted for the government to present for formal public consultation. The SIA and Maritime Safety Study have been accepted for public consultation. Following EIA reviews in 2019, Greenland's EAMRA produced a short list of 'Type 1' issues for further clarification and study. Meetings were then held with Greenland's EAMRA to discuss Type 1 issues and determine what additional work should be done to address these. Once Type 1 issue have been resolved, the EIA will be ready for public consultation.

The main area of additional work to address a number of Type 1 issues is associated with the tailings management methods. All additional studies relating to tailings management have now been completed.

## **Closure Method**

The method of tailings closure based on current technology is to close the tailings facility as a lake (wet closure). This closure design and method were developed to Feasibility Study level by AMEC Foster Wheeler in 2015 and updated in 2017. As part of further investigations EAMRA requested that a dry closure method be developed to the same level of detail to allow a direct comparison to the wet closure method.

Klohn Crippen Berger (KCB) were selected as an independent specialist consultancy to conduct this work. KCB developed a detailed dry closure design considering best available technology (BAT) to the same standard as the wet design, and subsequently conducted a trade-off study. The trade-off study concluded that the wet closure design has a lower environmental impact based on the criteria

assessed by KCB. Significantly, due to the long projected life of the Kvanefjeld Project, EAMRA has deemed that a final decision on closure will be deferred to later in the operational phase, at which point any new technologies or considerations can be effectively applied.

### **Seismic Analysis and Modelling**

KCB has also performed a two-part analysis to determine the stability of the tailings dam walls. The first part of the assessment determined the maximum number and magnitude of earthquakes which will be encountered during the life of the project and beyond. The latest information from GEUS (Greenland and Denmark Geology Survey) was applied to ensure modelling was accurate. The second part included determining the stability of the planned tailings dam walls. The results of the modelling and analysis showed the tailings dam wall will be stable under maximum earthquake scenarios.

KCB were also engaged to develop a three-dimensional model to investigate the impacts of a theoretical tailings dam wall failure. The Kvanefjeld tailings facility is designed to be a permanent installation which returns the land close to its original form after operations, and is designed to the highest standards. The design can withstand a maximum expected earthquake over a 10,000-year period for southern Greenland. It is common practice for EIAs to evaluate the consequences of a catastrophic tailings dam failure regardless of site-specific likelihood and failure mode. As such, a worst-case hypothetical tailings facility failure was evaluated to determine the consequences for the environment.

The 3D modelling by KCB builds on a study based on two-dimensional modelling of a hypothetical failure scenario by independent consultant Arcadis. The KCB modelling indicates that under a failure scenario, the released solids and water would be naturally channelled via the Taseq Valley to Illua Bay below. The 3D modelling indicates that a theoretical failure will not flow into the town of Narsaq, nor is it expected to result in any fatalities, and the impact of such an event on the environment is assessed by KCB to be medium.

### **Site Hydrology**

GML conducted a series of meetings with the advisors to the Government of Greenland to discuss possible impacts to the local water environment. After further exchange of documents and plans to mitigate any excursions the EIA will be updated with additional explanatory material. The modifications are being incorporated into the updated EIA document.

### **Radon Studies**

Additional laboratory test work has been performed to determine the surface area of samples used for radon release test work in 2018. This information has been provided to the independent consultant Arcadis to verify their radiation impact assessments. Arcadis has confirmed that the latest

information is consistent with previous calculations and have updated specific radon reports to include this and other information.

### **Next Steps**

Specialist consultancy Shared Resources is updating the main EIA document to incorporate outcomes of the addition studies, a process that will be finalised prior to the end of March. Lead consultant Ms Liz Wall has a strong working knowledge of the Kvanefjeld Project, having played a key role in developing the SIA which has been accepted for public consultation.

Once Type 1 issues have been satisfactorily addressed, and translated versions of the updated EIA are complete, the Kvanefjeld Project will be ready for public consultation. GML is confident that following clear guidance that stemmed from meetings with Greenland's EARMA through late 2019, and the high quality of independent specialist consultants that are addressing these points, the Kvanefjeld EIA will address all issues.

Reviews of the additional material will commence once submitted, and the company will look to update on the review schedule. In parallel to the reviews, translations of the main EIA document will be undertaken. As these have been done previously, and modifications and additional material is relatively minor, updating the translated EIA versions will be an efficient process.

The Company looks forward to providing further updates as progress continues.

Authorised by:  
John Mair  
Managing Director

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## ABOUT GREENLAND MINERALS LTD.

Greenland Minerals Ltd (ASX: GGG) is an exploration and development company focused on developing high-quality mineral projects in Greenland. The Company's flagship project is the Kvanefjeld Rare Earth Project. A pre-feasibility study was finalised in 2012, and a comprehensive feasibility study was completed in 2015 and updated following pilot plant operations in 2016. The studies demonstrated the unique and highly advantageous strengths of the Kvanefjeld Project and outlined the potential for Kvanefjeld to be developed as a long-life, low cost, and large-scale producer of rare earth elements; key enablers to the electrification of transport systems.

GML is working closely with major shareholder and strategic partner Shenghe Resources Holding Co Ltd to develop Kvanefjeld as a cornerstone of future rare earth supply. An exploitation (mining) license application for the initial development strategy was reviewed by the Greenland Government through 2016 -19 and was updated in 2019 following addition supporting studies.

In 2017-18, GML undertook technical work programs with Shenghe Resources Holding Co Ltd that improved the metallurgical performance and simplified the development strategy and infrastructure footprint in Greenland, with optimised Feasibility Study outcomes announced in mid-2019. This defined a significantly enhanced project cost-structure and a direct alignment with downstream processing. In addition, the Company continues its focus on working closely with Greenland's regulatory bodies on the processing of the mining license application and maintaining regular stakeholder updates.

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Greenland Minerals Ltd will continue to advance the Kvanefjeld project in a manner that is in accord with both Greenlandic Government and local community expectations and looks forward to being part of continued stakeholder discussions on the social and economic benefits associated with the development of the Kvanefjeld Project.

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## **Competent Person Statement – Mineral Resources Ore Reserves and Metallurgy**

*The information in this report that relates to Mineral Resources is based on information compiled by Mr Robin Simpson, a Competent Person who is a Member of the Australian Institute of Geoscientists. Mr Simpson is employed by SRK Consulting (UK) Ltd ("SRK") and was engaged by Greenland Minerals Ltd on the basis of SRK's normal professional daily rates. SRK has no beneficial interest in the outcome of the technical assessment being capable of affecting its independence. Mr Simpson has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Robin Simpson consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.*

*The information in the statement that relates to the Ore Reserves Estimate is based on work completed or accepted by Mr Damien Krebs of Greenland Minerals Ltd and Mr Scott McEwing of SRK Consulting (Australasia) Pty Ltd. The information in this report that relates to metallurgy is based on information compiled by Damien Krebs.*

*Damien Krebs is a Member of The Australasian Institute of Mining and Metallurgy and has sufficient experience that is relevant to the type of metallurgy and scale of project under consideration, and to the activity he is undertaking, to qualify as Competent Persons in terms of The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012 edition). The Competent Persons consent to the inclusion of such information in this report in the form and context in which it appears.*

*Scott McEwing is a Fellow and Chartered Professional of The Australasian Institute of Mining and Metallurgy and has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration, and to the activity he is undertaking, to qualify as Competent Persons in terms of The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012 edition). The Competent Persons consent to the inclusion of such information in this report in the form and context in which it appears.*



The mineral resource estimate for the Kvanefjeld Project was updated and released in a Company Announcement on February 12<sup>th</sup>, 2015. The ore reserve estimate was released in a Company Announcement on June 3<sup>rd</sup>, 2015. There have been no material changes to the resource estimate, or ore reserve since the release of these announcements.