VHD TECHNOLOGY PILOT PLANT EXCEEDS INDUSTRY BENCHMARKS ON FIRST COMMISSIONING RUN

- First production of VHD graphite test blocks from Line 1 at the Company's pilot plant in New South Wales, has been successfully completed, **yielding 12 test samples which generated exceptional results that exceed industry benchmarks with zero optimisation.** This achievement represents a significant milestone in the wet commissioning process.

- Initial coin-sized test samples (25mm diameter, 4–7mm thickness) were created. Future samples will include a range of sizes specifically for testing purposes.

- Density testing revealed outstanding results on first samples:

    - Best average density: **1,959 kg/m³**

    - Best peak density: **1,979 kg/m³**

- The achieved densities surpass industry standards for nuclear graphite (**1,700–1,900 kg/m³**)[1] and electrode graphite (**1,550–1,800 kg/m³**)[2] on the first pass, highlighting the unique and significant potential of GCM's VHD technology.

- Testing was conducted by renowned material science expert Professor Andrew Ruys, ensuring accuracy and credibility of the results.

- Further testing, including thermal conductivity and electrical resistivity, will be evaluated next by external labs to test the material's performance on these first commissioning run samples.

- The unoptimised VHD process delivers superior graphite properties at a lower cost in a shorter period of time, with first coin samples produced as part of the wet commissioning process. This highlights the simplicity, efficiency, and environmental benefits of the VHD Technology process in creating high-quality graphite products.

---

[1] Source: Nuclear Graphite Components, Idaho National Laboratory – William E Windes, April 2019

[2] Determined from research conducted by GCM Management from graphite electrode producer technical data sheets

Green Critical Minerals Ltd (ASX: GCM) ('**GCM'** or 'the **Company'**) is pleased to announce a significant milestone in the development of its VHD Technology pilot plant. The first run of Line 1, conducted as part of the wet commissioning process, has successfully produced 12 test samples of VHD graphite coins for initial testing.

The samples, each measuring 25mm in diameter and 4–7mm in thickness, were designed to test and validate the pilot plant's full operational cycle. Despite this being an unoptimised first run for commissioning purposes, the initial results generated were excellent and exceeded industry benchmarks, highlighting the significant potential of our simple, scalable and fast VHD Technology process.

Managing Director, Clinton Booth, commented:

"We are thrilled with the results of our maiden test from the VHD Technology pilot plant. Achieving such exceptional density properties on this first commissioning run, without any optimisation, is a testament to the quality and potential of our VHD technology and process. These results validate our confidence in the technology and importantly, position us as leaders in the production of high-performance graphite globally.

"To see our unoptimised samples outperforming industry benchmarks, such as nuclear-grade and electrode-grade graphite, demonstrates the transformative capabilities of our innovative VHD Technology. This success highlights the environmental and economic advantages of our production process, delivering superior properties faster and at a lower cost than traditional methods.

"The future of GCM is truly exciting as we advance our speed-to-market strategy for our VHD Technology, with a focus on achieving commercialisation by the end of 2025. What excites the team the most is our position in the market to benefit from the growing demand across multiple sectors requiring VHD graphite blocks, including advanced electronics, renewable energy, and industrial processes. As the only listed company globally with the technology to produce these VHD graphite blocks, GCM stands at the forefront of opportunity in this space.

"2025 is set to be a busy and transformative year for the Company and we look forward to achieving our objectives and delivering significant value to our shareholders."

DENSITY RESULTS AND BENCHMARK COMPARISON

The following density results were achieved during this wet commissioning process:

- **Sample Mix 1**:
  - **Average Density**: 1,959 kg/m³
  - **Peak Density**: 1,979 kg/m³

- **Sample Mix 2**:
  - **Average Density**: 1,921 kg/m³
  - **Peak Density**: 1,941 kg/m³

The peak density achieved, 1,979 kg/m³, compares favourably to the previously reported peak density of 2,050 kg/m³ for the VHD Technology graphite block (within 3.4%), putting it well in reach to achieve on optimisation. This result is particularly noteworthy given that it was achieved during an initial test run focused on commissioning the pilot plant, without any optimisation of the production process, or raw materials.

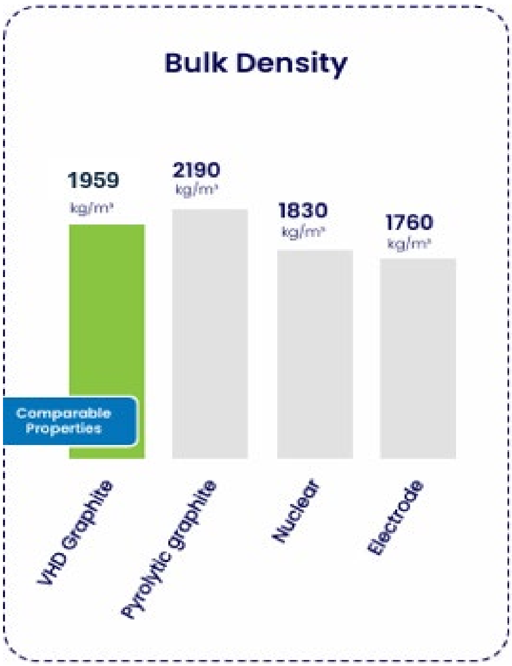

Figure 1 - VHD Graphite Benchmark on First Pass

These results validate the efficiency and capability of the VHD Technology process, positioning GCM's graphite as a high-quality material for advanced applications. Notably, the achieved densities exceed those of many premium graphite products currently on the market. Samples were produced from third party sourced technical grade graphite >90% carbon content. See Appendix A for results from the complete sample set.

SIGNIFICANCE OF INITIAL RESULTS

The primary objective of this first commissioning run was to test the full operational cycle of the pilot plant. This was successfully achieved and the fact that the samples produced during this phase achieved densities approaching peak benchmark values underscores the inherent quality of the VHD Technology, the quality of graphite produced and the effectiveness of the production process.

These results provide a solid foundation for further optimisation and refinement, which are expected to enhance performance metrics in subsequent runs.

SUPERIOR PROPERTIES COMPARED TO INDUSTRY STANDARDS

The initial test results from this commissioning run highlight an exceptional achievement, with the density properties of the first-pass samples already surpassing those of nuclear-grade and electrode-grade graphite. These materials are widely recognised as benchmarks for high-performance graphite in critical applications, including nuclear reactors and industrial electrodes. Importantly, there is significant room for further improvement from these initial results, as there were no levels of optimisation made during the first commissioning run.

- **Nuclear Graphite**: Typically has a density range of **1,700–1,900 kg/m³**, depending on its specific application in reactors. The first-pass VHD graphite samples achieved a **best average density of 1,959 kg/m³** and a **peak density of 1,979 kg/m³**, exceeding the upper range for nuclear graphite.

- **Electrode Graphite**: Commonly used in electric arc furnaces, electrode graphite typically exhibits densities of **1,550–1,800 kg/m³** to balance conductivity and structural durability. The first-pass VHD graphite samples also outperformed these benchmarks, with a **best average density of 1,959 kg/m³** and a **peak density of 1,979 kg/m³**, positioning VHD graphite as a premium material for industrial and metallurgical applications, including electrodes and energy-intensive manufacturing processes.

These results were achieved using GCM's proprietary and highly efficient VHD production process.

This achievement underscores the transformative potential of VHD Technology which not only delivers a product with superior graphite properties but does so faster and more cost-effectively than traditional methods. The streamlined process requires less time and energy, making it an environmentally friendly and economically viable alternative for producing premium graphite materials. Demand is rapidly growing for superior products, such as VHD graphite blocks, which are used in a wide range of sectors including high performance computing, data centres, AI, energy storage, defense, nuclear, automotive and aerospace.

RELEVANCE OF DENSITY PROPERTIES

Density is a critical metric for graphite performance, directly influencing several key material properties and application capabilities:

1. **Thermal Conductivity**: Higher density improves the material's ability to conduct heat efficiently, a vital characteristic for applications such as heat sinks in high-performance computing, solar-thermal energy storage, and advanced industrial processes.

2. **Electrical Conductivity**: Improved density enhances the material's electrical conductivity, a key requirement for advanced electronics, batteries, and renewable energy systems.

3. **Chemical Stability**: Higher density reduces porosity, increasing resistance to chemical attack and oxidation, essential for applications in corrosive environments like industrial electrodes or chemical manufacturing.

4. **Energy Storage Efficiency**: In thermal energy storage systems, higher density translates to greater energy storage capacity, enabling more efficient storage and discharge cycles for renewable energy applications.

These properties reinforce the versatility and value of VHD graphite in high-performance sectors, from renewable energy to industrial manufacturing.

NEXT STEPS IN TESTING AND VALIDATION

Following density testing which was conducted by Professor Andrew Ruys, the samples will undergo additional advanced analysis, including:

1. **Thermal Conductivity Testing**: To measure the efficiency of heat transfer, a critical parameter for applications such as heat sinks, solar-thermal energy storage, and high-temperature industrial processes.

2. **Electrical Resistivity Testing**: To assess the material's electrical performance, essential for advanced electronics and other high-demand sectors.

These tests will further validate the material's suitability for various high-performance applications and guide ongoing optimisation efforts.

STRATEGIC IMPORTANCE AND BROADER CONTEXT

The results achieved during this initial run demonstrate the transformative potential of the Company's VHD Technology. Key advantages include:

- **High Efficiency**: The production process consistently achieves high-quality results while requiring less time and energy compared to traditional methods.

- **Environmental Sustainability**: The streamlined production process minimises environmental impact, aligning with global decarbonisation goals.

- **Scalability and Versatility**: VHD Technology's modular scalability supports applications ranging from microgrid-scale systems to utility-scale renewable energy projects.

These early-stage results confirm the suitability of VHD graphite for high-value industries, including renewable energy, aerospace, advanced manufacturing, and electronics.

OUTLOOK AND COMMERCIALISATION PATH

Completion of this commissioning run milestone reinforces the Company's commitment to innovation and continuous improvement. The next phase of wet commissioning will focus on refining the production process and scaling up sample production for customer validation and qualification testing.

As testing progresses, the Company remains focused on advancing toward full-scale commercialisation, with updates on further milestones and testing outcomes to follow.

For further information please contact:

Clinton Booth
Managing Director
enquiry@gcminerals.com.au
(08) 9388 0051

Stephanie Richardson / Cameron Gilenko
Sodali & Co
stephanie.richardson@sodali.com / cameron.gilenko@sodali.com
(08) 6160 4903

Authorisation

The provision of this announcement to the ASX has been authorised by the Board of Directors of Green Critical Minerals Limited.

Forward Looking Statements

This announcement contains general information about GCM's activities current as at the date of the announcement. The information is provided in summary form and does not purport to be complete.

This release contains estimates and information that is based on projections, assumptions and estimates of our future performance and the future performance of the industry in which we operate and is necessarily subject to a high degree of uncertainty and risk due to a variety of factors, which could cause results to differ materially from those expressed in these publications and reports.

Appendix A - Table of Results

No.	Mix	d (mm) diameter	t (mm) thickness	D (kg/m^3) Density
1	1	25.14	4.013	1979
2	1	25.14	5.03	1951
3	1	25.11	5.947	1952
4	1	25.11	6.955	1953
5	1	25.11	7.04	1959
6	1	25.11	6.962	1956
7	2	25.14	3.998	1929
8	2	25.15	4.975	1927
9	2	25.11	5.942	1928
10	2	25.15	6.923	1941
11	2	25.14	7.04	1913
12	2	25.12	7.022	1885