



28 April 2022

Positive Metallurgical Test Work results achieved on targeted samples from the Cape Flattery Silica Sand Project

Highlights

- Results achieved from this latest round of testwork produced an exceptionally high-quality product that contains +99.99% SiO₂ and Fe₂O₃ grades of between 70ppm to 90ppm
- The characterisation testwork was carried out by Mineral Technologies on three targeted samples with the aim of the laboratory-scale testwork to produce the highest grade silica sand product that can be achieved by conventional processing methods
- This result was achieved by dry and wet screening, heavy liquid separation and attritioning
- The heavy liquid separation produced the most significant reduction in Fe₂O₃ content with the bulk of the iron being removed by this stage
- Test work is continuing at Minerals Technologies with a bulk sample comprising approximately 800kg of sand from Cape Flattery being run through a pilot plant for process design purposes

Metallica Minerals Limited (**Metallica**, ASX: MLM) is pleased to announce that results from the latest round of metallurgical testwork on three targeted samples from the Cape Flattery Silica project have confirmed that a high-quality premium product can be achieved from a key area within the project.

This round of metallurgical testing was undertaken following the previous bulk testing undertaken on a sub-sample of material from a 914kg composite sample taken from drilling completed in August 2021 (see ASX release 21 March 2022: "Cape Flattery Silica PFS confirms excellent economics and maiden ore reserve"). The PFS disclosed that specific metallurgical test work would be undertaken "to confirm process pathways to reduce Fe₂O₃ content to less than 120ppm in our product." The three targeted samples are the first stage of this metallurgical test work.

The latest testwork was undertaken by Mineral Technologies and involved a silica sand characterisation study and was conducted on three samples (Samples CFS2 to CFS4) with the work comprising laboratory-scale tests to produce products that represent the purest silica sand that may be achievable using conventional mineral processing methods.

The sand characterisation study involved using a suite of laboratory tests to understand how the sand will behave in a full-scale processing plant. The sand sample is run through a series of stages, with the silica content and the iron content recorded at the end of each stage. This work identifies which stages, (laboratory methods) are crucial in upgrading the feed sand to a high-end product.

The laboratory work involved:

- Dry screening at 1mm to remove oversize
- Wet screening at 45µm to remove slimes
- Dry screening of the +45µm fraction using 600 and 106µm screens

- Heavy liquid separation (HLS) of the -600+106µm fraction at a specific gravity of 2.70, to mimic spirals
- Intensive attritioning of the HLS float fraction for 5 minutes
- Magnetic separation

Metallica Executive Chairman, Theo Psaros said “as disclosed in our Pre-feasibility Study (see ASX release: 21 March 2022: “Cape Flattery Silica PFS Confirms Excellent Economics and Maiden Ore Reserve”) we advised that we needed to undertake additional metallurgical testing to seek to achieve a reduction in the level of Fe₂O₃ to ≤ 120ppm. These three samples tested had different raw feed characteristics (Fe₂O₃ and SiO₂ grades) to the bulk sample initially tested. The initial sample collected for testwork was a composite sample which comprised sand from different part of the Cape Flattery deposit. The three samples tested were from one area within the Measured Resource.

Having achieved these very impressive levels of low Fe₂O₃, these results will give potential offtake partners significant confidence in our project’s potential and our ability to produce a high premium product. Test work is continuing at Mineral Technologies with a bulk sample comprising approximately 800kg of sand from Cape Flattery being run through a pilot plant for process design purposes. Future metallurgical tests are to target specific areas of the resource to determine where the best sand is that when processed, will generate a premium product.”

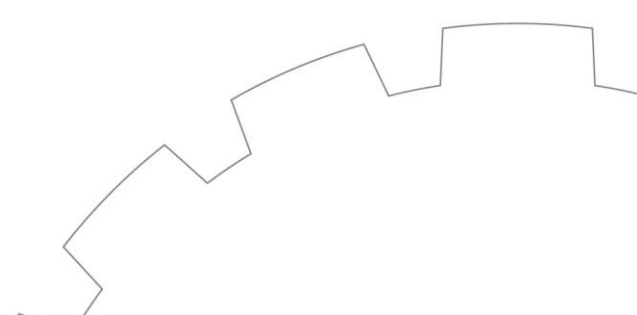
This recent round of metallurgical testwork highlighted that the HLS stage of the process shows the most significant reduction in Fe₂O₃, with the Fe₂O₃ content of the silica sand reduced from grades of 260 ppm Fe₂O₃ to between 70ppm and 100ppm. The dry screening completed prior to the HLS stage and the proceeding attritioning stage only saw minimal changes in the Fe₂O₃, grade of the products. The lowest Fe₂O₃, grades achieved by this testwork for Samples CFS2, CFS3 and CFS4 were 70ppm, 90ppm and 90ppm respectively.

The HLS stage rejected roughly 0.10% of the feed mass to the sink fractions. The sink fractions had high concentrations of TiO₂ and Fe₂O₃ which are probably in ilmenite. Removal of the sinks saw a major reduction in the Fe₂O₃ content of the float fractions to between 70 and 100ppm Fe₂O₃.

The progressive reduction in the Fe₂O₃ grade at the HLS and attritioning stage of the testwork is presented in Table 1 below and the silica sand product produced after the HLS stage and the predominantly iron rich “reject” material are shown in Figure 1 below.

| Fraction | Fe ₂ O ₃ content (ppm) | | |
|----------------------------|--|-----------------|-----------------|
| | Sample 1 (CFS2) | Sample 2 (CFS3) | Sample 3 (CFS4) |
| -600+106µm fraction | 260 | 190 | 250 |
| gravity float (-2.7sg) | 70 | 100 | 100 |
| attritioned float (+106µm) | 70 | 90 | 90 |
| non-magnetic float | 70 | 90 | 90 |

Table 1. Progressive characterisation Fe₂O₃ grades



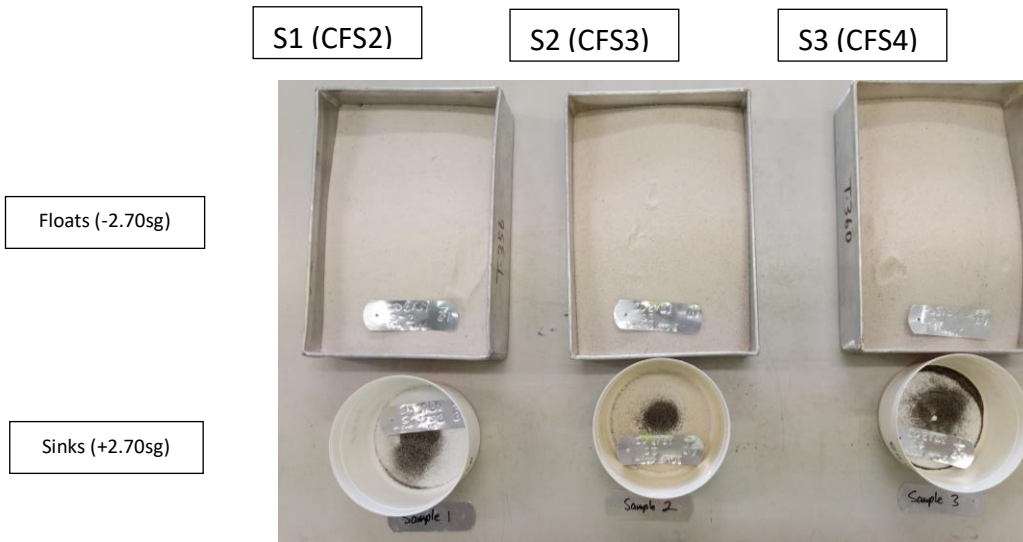


Figure 1: HLS products

The final stage of the characterisation testwork involved the use of a magnetic separator on the attritioned product. No significant upgrade in the silica content of the samples or a reduction in the iron content of the final product was achieved, with the final product after the magnetic separation being 99.99% SiO₂ and between 70ppm to 90ppm Fe₂O₃ for the three samples.

A particle size distribution study was completed on the sand product, after the magnetic separation stage. The study was undertaken to ensure that the particle size of the final product falls within the optimum specifications for a premium sand product.

The products had been classified to -600+106µm fractions, so only a negligible amount of material was contained outside this range with the 150, 212 and 300µm fractions retaining the highest mass proportions of the size fractions. Figures 2 and 3 show the silica sand collected from each size fraction and the particle size distribution (PSD) graph respectively.

The PSD study confirms that the silica sand product conforms to the specifications for a premium product.

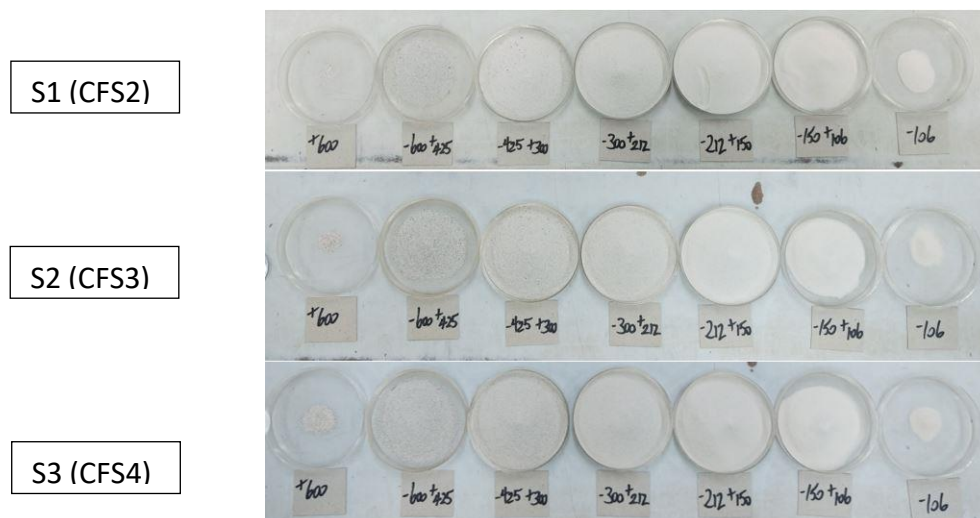


Figure 2: PSD on non-magnetic fraction

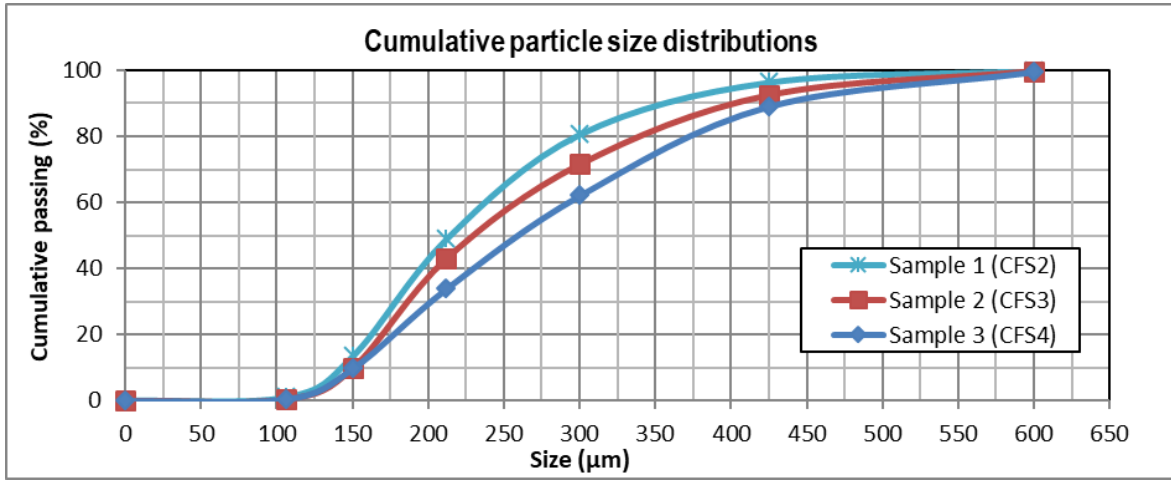


Figure 3: Cumulative particle distribution curves of non-magnetic products

A table summarising the assay results for the various stages of the testwork is included as table 4 in the Appendices.

About the Cape Flattery Silica (CFS) Project

Metallica’s 100% owned Cape Flattery Silica Sands (CFS) project is adjacent to the world class Cape Flattery Silica Sand mining and shipping operation owned by Mitsubishi. Exploration drilling to date has now confirmed that the sand dunes within EPM 25734 contain high purity silica sands with an in-situ quality which is understood to be comparable to Mitsubishi’s Cape Flattery Silica Mine. On 15 June 2021 the Company announced that it had lodged a Mine Lease Application (MLA) for the project (see ASX Release: 15 June 2021 MLA Lodged for Cape Flattery Silica), Figure 6.

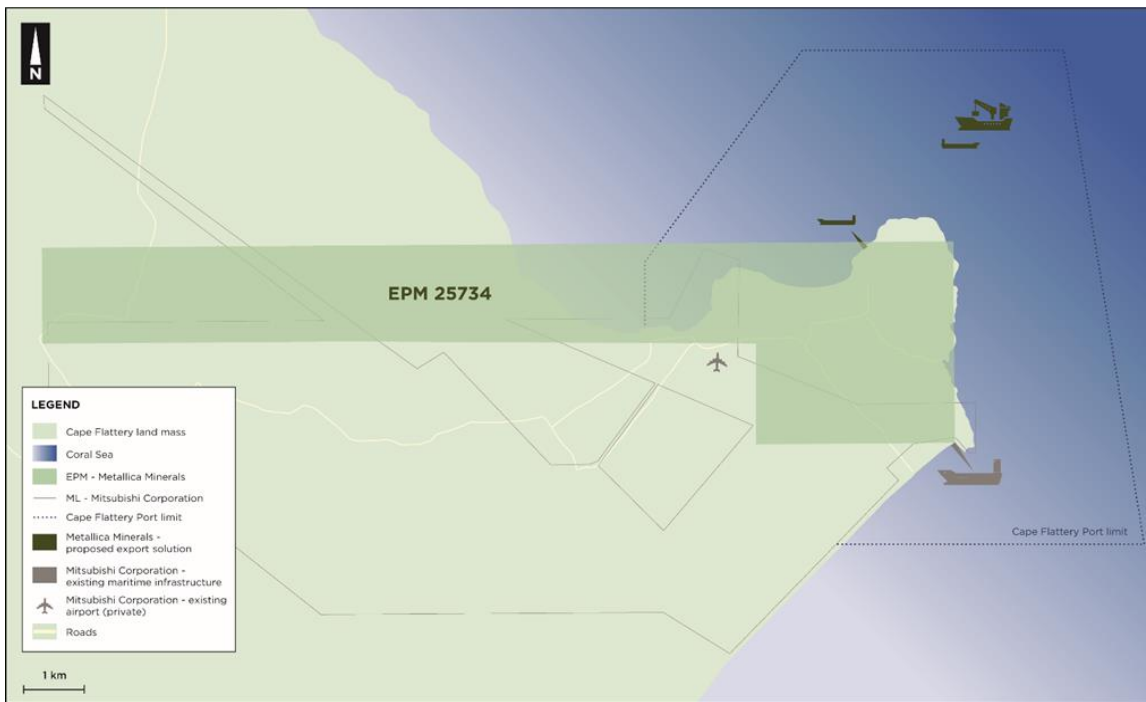


Figure 4 EPM 25734 location and orientation at Cape Flattery and within the Cape Flattery Port limit



Figure 5. Yearlong Contractors vacuum-based drill rig working at CFS project with Mitsubishi silica sand operations in the background

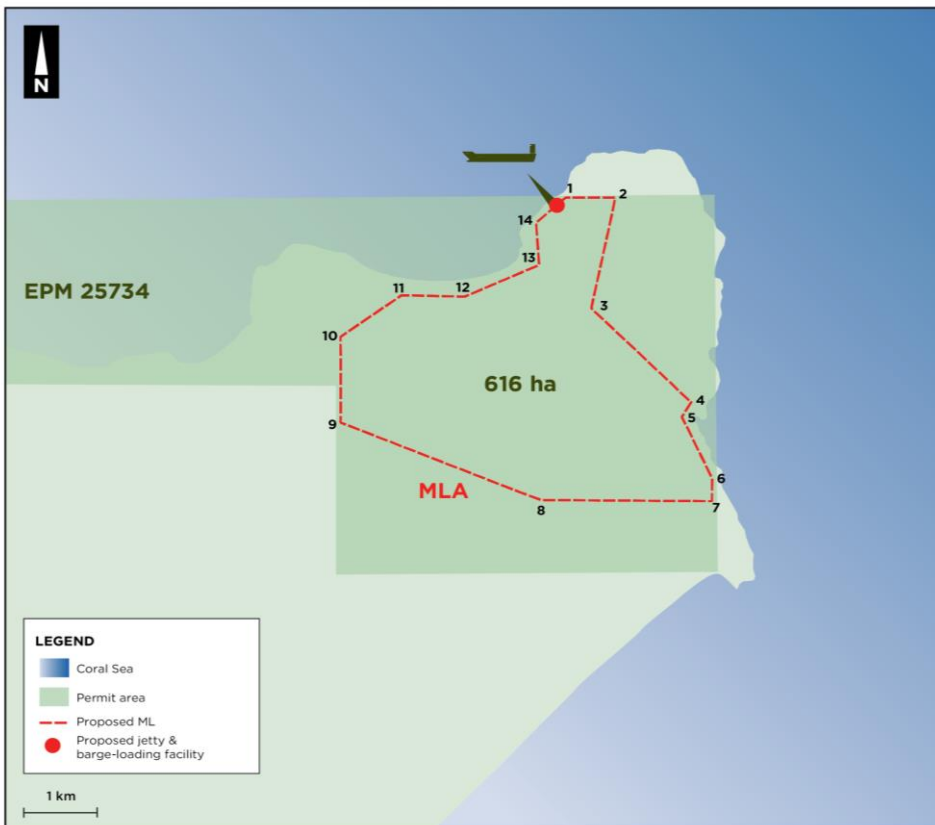
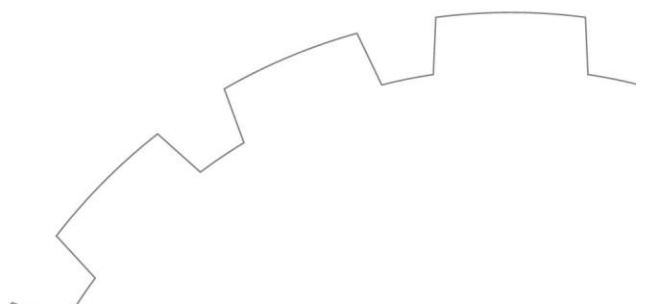


Figure 6 Cape Flattery Mining Lease Boundary (Application)



On 21 March 2022 the Company released the Pre-feasibility Study (PFS) for the CFS Project (see ASX Release 21 March 2022: “Cape Flattery Silica PFS Confirms Excellent Economics and Maiden Ore Reserve”).

The key highlights of the PFS Report are as follows:

- Cape Flattery Silica Sand Project’s (CFS) Pre-Feasibility Study (PFS) confirms the Project can be a long-life silica sand project producing high-quality silica sand for the booming Asia-Pacific glass manufacturing markets supplying the solar panel industry.
- The PFS returns pre-tax Net Present Value (NPV⁸) of A\$290 million (M), Internal Rate of Return (IRR) of 34.9% and life of Project cash revenue of A\$2,127M. This compares with the Updated Scoping Study (10 November 2021) which had an NPV⁸ of A\$253M.
- The Capital Cost of CFS is estimated to be \$79M (including a 15% contingency of \$10M) with a payback period from commencement of production of 3.9 years. All production is based on the Maiden Ore Reserve (refer table 2 – Ore reserves).
- The Maiden Ore Reserve of 46 million tonnes (Mt, See Table 2) @ 99.18% SiO₂ (within a Mineral Resource of 53.5Mt @ 99.19% SiO₂, refer to table 3 - Mineral Resource) is exploited over a 25 year Project life producing saleable product of 1.35Mt per annum.
- Sensitivity and scenario analysis demonstrate the Project is financially robust and can maintain a positive Net Present Value (NPV) through stress-testing of the various scenarios.
- Both the sand extraction area and the industry standard processing facility will have a small footprint and low environmental impact.
- A purpose-built jetty is planned to be constructed (subject to Development Approval (DA)) to allow barge loading and transhipping operations. This infrastructure, importantly, is located within the Port Limit of Cape Flattery.
- Development of CFS will deliver employment, apprenticeship and training opportunities to the Hope Vale and Cooktown communities, particularly the local indigenous communities.
- CFS will contribute to delivery of the Queensland Government’s commitment to the development of new economy minerals in Far North Queensland.
- The results from the PFS demonstrate a strong financial case and the Company’s Board has approved commencement of a Definitive Feasibility Study (DFS) in Q2 2022.

Table 2: Maiden Ore Reserve

| Ore Reserve Category | Tonnage Mt | SiO ₂ % | Fe ₂ O ₃ % | TiO ₂ % | Al ₂ O ₃ % | LOI % | Waste Mt | Silica Sand Mm ³ |
|----------------------|------------|--------------------|----------------------------------|--------------------|----------------------------------|-------|----------|-----------------------------|
| Probable Reserve | 46 | 99.18 | 0.12 | 0.14 | 0.11 | 0.19 | 2.6 | 28.76 |

Table 3: Mineral Resource for the Cape Flattery Silica Project

| Resource Category | Silica Sand Mt | SiO ₂ % | Fe ₂ O ₃ % | TiO ₂ % | LOI % | Al ₂ O ₃ % | Density t/m ³ | Silica Sand Mm ³ |
|-------------------|----------------|--------------------|----------------------------------|--------------------|-------------|----------------------------------|--------------------------|-----------------------------|
| Measured | 9.55 | 99.29 | 0.10 | 0.13 | 0.18 | 0.08 | 1.6 | 5.97 |
| Indicated | 38.25 | 99.15 | 0.13 | 0.14 | 0.19 | 0.12 | 1.6 | 23.91 |
| Inferred | 5.66 | 99.26 | 0.11 | 0.11 | 0.18 | 0.16 | 1.6 | 3.54 |
| Total | 53.46 | 99.19 | 0.12 | 0.14 | 0.19 | 0.12 | 1.6 | 33.41 |

The Mineral Resource Estimate has been reported in accordance with the JORC Code 2012. A cut-off grade 98.5% has been defined based on the surrounding data. These results show there is good potential to produce a premium grade silica product using standard processing techniques (See ASX release 21 March 2022: “Cape Flattery Silica PFS Confirms Excellent Economics and Maiden Ore Reserve”).

This announcement has been approved in accordance with the Company’s published continuous disclosure policy and has been approved by the Board.

For further information, please contact:

Mr Theo Psaros
Executive Chairman
+61 (7) 3249 3000

Mr Scott Waddell
CFO & Company Secretary
+61 (7) 3249 3000

Competent Person Statement

Cape Flattery Silica Sands Exploration Results

The information in this report that relates to the Exploration Sampling and Exploration Results is based on information compiled by Mr Patrick Smith, a Competent Person who is a Member of the Australian Institute of Mining and Metallurgy.

Mr Smith is the owner and sole Director of PSGS Pty Ltd and is contracted to Metallica Minerals as their Exploration Manager. Mr Smith confirms there is no potential for a conflict of interest in acting as the Competent Person. Mr Smith has sufficient experience that is relevant to the style of mineralisation and type of deposits 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. Mr Smith consents to the inclusion of this information in the form and context in which it appears in this release/report.

Cape Flattery Silica Sand Resource

The information in this report that relates to the Cape Flattery Silica Project – Eastern Resource Area is based on information and modelling carried out by Chris Ainslie, Project Engineer, who is a full-time employee of Ausrocks Pty Ltd and a Member of the Australasian Institute of Mining & Metallurgy. The work was supervised by Mr Carl Morandy, Mining Engineer who is Managing Director of Ausrocks Pty Ltd and a Member of the Australasian Institute of Mining & Metallurgy, and also by Mr Brice Mutton who is a Senior Associate Geologist for Ausrocks Pty Ltd. Mr Mutton is a Fellow of the Australasian Institute of Mining & Metallurgy and a Fellow of the Australian Institute of Geoscientists. Mr Morandy and Mr Ainslie and Mr Mutton are employed by Ausrocks Pty Ltd which has been engaged by Metallica Minerals Ltd to prepare this independent report, there is no conflict of interest between the parties. Mr Morandy, Mr Ainslie and Mutton consent to the disclosure of information in the form and context in which it appears in this report.

The overall resource work for the Cape Flattery Silica Project – Eastern Resource Area is based on the direction and supervision of Mr Mutton who has sufficient experience that is relevant to the style of mineralisation and type of deposits 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”.

Cape Flattery Silica Sand Ore Reserves

The information in this report that relates to Ore Reserves at the Cape Flattery Silica Sand Project is based on information reviewed or work undertaken by Mr Carl Morandy. Mr Morandy is a Mining Engineer, the Managing Director of Ausrocks Pty Ltd and a Member of the Australasian Institute of Mining & Metallurgy. Mr Morandy has relied on Metallica Minerals Limited for marketing, environmental, economic, social and government permitting. Ausrocks Pty Ltd have been engaged by Metallica Minerals Limited to prepare this independent report and there is no conflict of interest between the parties.

Mr Morandy has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the preparation of mining studies to qualify as a Competent Person as defined in the 2012 edition of the Australasian Code for Reporting of Ore Reserves (The JORC Code). Mr Morandy consents to the inclusion in the report on the matters based on their information in the form and context in which it appears.

The corresponding JORC 2012 Table 1 is attached in the PFS report dated 21 March 2022

Cape Flattery Silica Sand - Process Metallurgy

The technical information in this report that relates to process metallurgy is based on work completed by Mineral Technologies and information reviewed by Etienne Raffailac (MAusIMM), who is a Principal Process Engineer and employee of Mineral Technologies.

Mr Raffailac has sufficient experience that is relevant to the type of processing under consideration and to the activity being undertaken to qualify as a Competent Person as defined by the JORC Code 2012. Mr Raffailac confirms there is no potential for a conflict of interest in acting as the Competent Person and consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

Reference to Previous Releases

PFS and reserve figures of this announcement have been previously reported to the market in the report dated 21 March 2022.

Drilling, resource estimates and metallurgical results referred to in this announcement have been previously announced to the market in reports dated; 2nd March, 15th June, 22nd June and the 12th August 2021 and are available to view and download from the Company's website: [ASX Announcements — Metallica Minerals Limited](#)

The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcements. MLM confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcements.

Forward-looking statements

Forward-looking statements are based on assumptions regarding Metallica, business strategies, plans and objectives of the Company for future operations and development and the environment in which Metallica may operate.

Forward-looking statements are based on current views, expectations and beliefs as at the date they are expressed and which are subject to various risks and uncertainties. Actual results, performance or achievements of Metallica could be materially different from those expressed in, or implied by, these forward-looking statements. The forward-looking statements contained in this presentation are not guarantees or assurances of future performance and involve known and unknown risks, uncertainties and other factors, many of which are beyond the control of Metallica, which may cause the actual results, performance or achievements of Metallica to differ materially from those expressed or implied by the forward-looking statements. For example, the factors that are likely to affect the results of Metallica include general economic conditions in Australia and globally; ability for Metallica to funds its activities; exchange rates; production levels or rates; demand for Metallica's products, competition in the markets in which Metallica does and will operate; and the inherent regulatory risks in the businesses of Metallica. Given these uncertainties, readers are cautioned to not place undue reliance on such forward-looking statements.

Table 4. Assays for the final product at various stages of the characterisation testwork

| fraction | % wt | | Assay (%) | | | | | | | | | | | | | | |
|----------------------------|----------|---------|------------------|--------------------------------|-------|--------------------------------|------------------|-------|-------------------|-------------------------------|-----------------|------------------|------------------|-------|-------------------------------|--------------------------------|---------------------|
| | to stage | to feed | SiO ₂ | Al ₂ O ₃ | CaO | Fe ₂ O ₃ | K ₂ O | MgO | Na ₂ O | P ₂ O ₅ | SO ₃ | TiO ₂ | ZrO ₂ | MnO | V ₂ O ₅ | Cr ₂ O ₃ | LOI ₁₀₀₀ |
| Sample 1 (CFS2) | | | | | | | | | | | | | | | | | |
| -600+106µm fraction | 97.5 | 96.4 | 99.8 | 0.051 | 0.004 | 0.026 | 0.002 | 0.002 | 0.001 | n/a | n/a | 0.041 | n/a | n/a | n/a | 0.0001 | 0.03 |
| gravity float (-2.7sg) | 99.9 | 96.2 | 99.9 | 0.028 | 0.004 | 0.007 | 0.002 | 0.001 | 0.001 | n/a | n/a | 0.015 | n/a | n/a | n/a | <0.0001 | 0.01 |
| attritioned float (+106µm) | 98.9 | 95.2 | 99.9 | 0.027 | 0.004 | 0.007 | 0.002 | 0.001 | 0.001 | n/a | n/a | 0.014 | n/a | n/a | n/a | 0.0001 | 0.01 |
| non-magnetic float | 99.2 | 94.4 | 99.9 | 0.026 | 0.004 | 0.007 | 0.002 | 0.001 | 0.002 | n/a | n/a | 0.014 | n/a | n/a | n/a | <0.0001 | 0.02 |
| slimes (-45µm) | 1.2 | 1.2 | 97.8 | 0.23 | 0.03 | 0.31 | 0.01 | 0.02 | n/a | 0.006 | 0.02 | 0.81 | 0.12 | 0.01 | <0.01 | 0.004 | 0.58 |
| -106+45µm fraction | 2.2 | 2.2 | 98.0 | 0.15 | 0.01 | 0.41 | 0.01 | 0.02 | n/a | 0.004 | 0.01 | 0.82 | 0.26 | 0.02 | <0.01 | 0.004 | 0.21 |
| Sample 2 (CFS3) | | | | | | | | | | | | | | | | | |
| -600+106µm fraction | 97.4 | 96.7 | 99.9 | 0.042 | 0.004 | 0.019 | 0.002 | 0.002 | 0.003 | n/a | n/a | 0.039 | n/a | n/a | n/a | <0.0001 | 0.03 |
| gravity float (-2.7sg) | 99.9 | 96.6 | 99.9 | 0.028 | 0.003 | 0.010 | 0.002 | 0.001 | 0.003 | n/a | n/a | 0.023 | n/a | n/a | n/a | <0.0001 | 0.03 |
| attritioned float (+106µm) | 99.2 | 95.9 | 99.9 | 0.026 | 0.004 | 0.009 | 0.002 | 0.001 | 0.002 | n/a | n/a | 0.021 | n/a | n/a | n/a | 0.0001 | 0.02 |
| non-magnetic float | 99.0 | 94.9 | 99.9 | 0.025 | 0.004 | 0.009 | 0.002 | 0.001 | 0.001 | n/a | n/a | 0.022 | n/a | n/a | n/a | 0.0001 | 0.03 |
| slimes (-45µm) | 0.7 | 0.7 | 97.5 | 0.26 | 0.04 | 0.33 | 0.02 | 0.03 | n/a | 0.009 | 0.02 | 0.75 | 0.11 | <0.01 | <0.01 | 0.003 | 0.85 |
| -106+45µm fraction | 1.0 | 1.0 | 98.3 | 0.16 | 0.01 | 0.32 | <0.01 | 0.02 | n/a | 0.004 | 0.02 | 0.73 | 0.16 | 0.02 | <0.01 | 0.001 | 0.24 |
| Sample 3 (CFS4) | | | | | | | | | | | | | | | | | |
| -600+106µm fraction | 97.8 | 96.9 | 99.8 | 0.048 | 0.004 | 0.025 | 0.002 | 0.002 | 0.002 | n/a | n/a | 0.054 | n/a | n/a | n/a | 0.0002 | 0.04 |
| gravity float (-2.7sg) | 99.9 | 96.8 | 99.9 | 0.026 | 0.003 | 0.010 | 0.002 | 0.001 | 0.002 | n/a | n/a | 0.025 | n/a | n/a | n/a | <0.0001 | 0.05 |
| attritioned float (+106µm) | 99.0 | 95.9 | 99.9 | 0.025 | 0.004 | 0.009 | 0.002 | 0.001 | 0.002 | n/a | n/a | 0.022 | n/a | n/a | n/a | <0.0001 | 0.03 |
| non-magnetic float | 99.1 | 95.0 | 99.9 | 0.026 | 0.004 | 0.009 | 0.002 | 0.001 | 0.002 | n/a | n/a | 0.021 | n/a | n/a | n/a | 0.0001 | 0.03 |
| slimes (-45µm) | 0.9 | 0.9 | 97.1 | 0.26 | 0.04 | 0.35 | 0.01 | 0.02 | n/a | 0.013 | 0.03 | 1.03 | 0.13 | 0.01 | <0.01 | 0.004 | 1.00 |
| -106+45µm fraction | 1.1 | 1.1 | 98.3 | 0.16 | 0.01 | 0.30 | 0.01 | 0.02 | n/a | 0.004 | 0.02 | 0.66 | 0.12 | 0.02 | <0.01 | 0.001 | 0.20 |

Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

| Criteria | Explanation | Commentary |
|---|--|---|
| Subsampling Techniques and Sample Preparation | <p><i>If core, whether cut or sawn and whether quarter, half or all core taken.</i></p> <p><i>If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.</i></p> <p><i>For all sample types, the nature, quality and appropriateness of the sample preparation technique.</i></p> <p><i>Quality control procedures adopted for all subsampling stages to maximise representivity of samples.</i></p> <p><i>Measures taken to ensure that the sampling is representative of the in-situ material collected, including for instance results for field duplicate/second-half sampling.</i></p> <p><i>Whether sample sizes are appropriate to the grain size of the material being sampled.</i></p> | <p>The characterization samples were processed at Mineral Technologies Carrara laboratory, Queensland.</p> <p>Representative sub-samples were extracted from the homogenized samples using industry standard subsampling and sample preparation techniques. All procedures are documented and conform with ISO 9001 quality standards.</p> <p>Dry samples were sub-sampled using a two-way riffle splitter.</p> <p>The laboratory sample mass taken is appropriate for the sand particle size being targeted.</p> <p>Duplicate samples were extracted for selected key samples.</p> |
| Sample Chemical Analyses | <p><i>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</i></p> <p><i>For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.</i></p> <p><i>Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.</i></p> | <p>Chemical analyses of representative subsamples of high purity silica samples were carried out by NATA accredited ALS Global, Brisbane. Samples for analysis were pulverized in an agate grinder. Analysis is conducted using fusion / ICP-AES (ME-PKG-85) method. Loss on ignition (LOI) is determined gravimetrically at 1000 degrees.</p> <p>Chemical analyses of representative subsamples of low-grade silica samples were carried out by NATA accredited BV, Perth. Samples for analysis were pulverized in a zirconia bowl with a barren flush between samples. A sub-sample of the pulverized pulp was cast using a flux to form a glass bead. Analysis is conducted using fusion X-Ray fluorescence MD-SIL-01 method. Loss on ignition (LOI) is determined gravimetrically at 1000 degrees.</p> <p>Chemical analyses of representative subsamples of rejects samples were carried out by NATA accredited BV, Perth. Samples for analysis were pulverized in a tungsten bowl with a barren flush between samples. A sub-sample of the pulverized pulp was cast using a flux to form a glass bead. Analysis is conducted using fusion X-Ray fluorescence MD-ILM-02 method. Loss on ignition (LOI) is determined gravimetrically at 1000 degrees.</p> <p>Checks (repeat analysis and duplicates samples) were completed as part of the determination of the chemical composition of the samples.</p> <p>Analysis of standards is included for every batch of samples.</p> |

| | | | | | | | | | | | | | | |
|--|--|---|-----------------------|---------------------------------------|------------|---------------------------------------|-------------------------|------------|--------------------------------------|-------------------------|------------|--------------------------------------|---------------------------------------|--------------------------|
| | | Detection limits for major oxide pertaining to each assaying method is tabulated below: | | | | | | | | | | | | |
| | | Assay detection limits | | | | | | | | | | | | |
| | | Method Name | SiO ₂ % | Al ₂ O ₃ ppm | CaO ppm | Fe ₂ O ₃ ppm | K ₂ O ppm | MgO ppm | P ₂ O ₅ ppm | TiO ₂ ppm | MnO ppm | V ₂ O ₅ ppm | Cr ₂ O ₃ ppm | LOI ₁₀₀₀ % |
| | | High Purity (ME-PKG85) | 0.1 | 10 | 10 | 10 | 10 | 10 | n/a | 10 | n/a | n/a | 1 | 0.01 |
| | | LG Silica (MD-SIL-01) | 0.01 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 0.01 |
| | | Rejects (MD-ILM-02) | 0.01 | 100 | 100 | 100 | 100 | 100 | 10 | 100 | 100 | 100 | 10 | 0.01 |

Section 2 Reporting of Metallurgical Results

| | | |
|---|---|---|
| <p>Metallurgical factors or assumptions</p> | <p>The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.</p> | <p>Several metallurgical test studies, including metallurgical characterizations and bulk sample processing, have been carried out or are in progress.</p> <p>The proposed processing flowsheet and plant required for the beneficiation of the Cape Flattery Silica Sand material is commonly seen in the industry.</p> <p>The separation techniques employed are conventional and include trash screening, desliming, gravity separation by spirals, mechanical attrition and size classification. Inclusion of a final stage of magnetic separation is being evaluated.</p> <p>The procedures used in the sample metallurgical characterization studies involves laboratory-scale simulation of the processing methods which would be used in the proposed processing plant.</p> <p>It should be noted that:</p> <ul style="list-style-type: none"> ▪ mass yields are not optimized during characterization test work as the main objective is to produce the highest quality product possible. ▪ results presented in the report pertain to the characterization of three targeted samples had different raw feed characteristics (Fe₂O₃ and SiO₂ grades) from historical work. <p><i>Feed preparation</i></p> <p>The sample is screened to remove trash oversize and then deslimed. These laboratory-scale procedures achieve a classification efficiency of nearly 100% and indicate the theoretical maximum performance.</p> <p>Screening is carried out using 200mm diameter, certified square-mesh test sieves.</p> |
|---|---|---|

| | | |
|--|--|---|
| | | <p><u>Gravity separation</u> The sample is densitometrically separated using heavy organic liquid (bromoform) at a specific gravity of 2.70. The procedure achieves a separation of near 100% efficiency and is used to indicate the theoretical cleanest product using gravity separation processing.</p> <p>Density separations is conducted using standard work practice heavy liquid separation (HLS) float/sink method.</p> <p><u>Classification</u> The gravity product is then classified by sieving at 600µm and 106µm in-line with standard industry size ranges. The classified gravity product (nominally -600+106µm) is sub-sampled and progresses for further testwork.</p> <p>Classification is carried out using 200mm diameter, certified square-mesh test sieves.</p> <p><u>Attrition (surface cleaning)</u> A representative sub-sample of the classified gravity (-2.70 SG) product is mechanically attritioned using a laboratory-scale stainless steel cell. A 1kg charge is processed at a pulp (solids) density of 60-65% solids w/w for five (5) minutes duration. The attrition discharge is further washed / classified by wet screening to remove fines.</p> <p>Classification is carried out using 200mm diameter, certified square-mesh test sieves.</p> <p><u>Magnetic separation</u> A representative sub-sample of the attritioned product is magnetically fractioned using a laboratory-scale Reading induced roll magnetic separator (IRMS). The fractionation is conducted in two stages (passes). The initial separation is intended to simulate wet magnetic separation using a Reading wet high intensity magnetic separator (WHIMS) operating at maximum intensity. The non-magnetic fraction is assayed to indicate the potential for product grade improvement using wet or dry magnetic separation.</p> |
|--|--|---|