METALLICA MINERALS LIMITED

ABN: 45 076 696 092
ASX Code: MLM

ASX RELEASE

17 JANUARY 2020

HIGH PURITY SILICA SANDS CONFIRMED AT CAPE FLATTERY PROJECT

HIGHLIGHTS

- **Sampling program at the Cape Flattery Silica Sand project (CFSS), in Far North Queensland, confirms the presence of high purity silica sands within eight (8) auger holes.**
- **Sampling identifies high purity silica sands with silica oxide sand (SiO_2) having a quality comparable with known resources in the region.**
- **Located adjacent to Mitsubishi's Cape Flattery mine, the world's single largest source of silica sand.**

Figure 1 – Sand dune from 2018 sample program

Metallica Minerals Limited (**ASX:MLM**) (**Metallica**, or the **Company**) is pleased to advise that a sampling program completed in the last quarter 2019 at its 100%-owned Cape Flattery Silica Sands project (**CFSS**) in Far North Queensland has confirmed the presence of high-purity silica sands (Figures 1 and 5).

High purity silica sands are becoming more sought after globally, with growth being driven by silica sand's applications across a broad range of industries including glass-making, foundry casting, water filtration, chemicals and metals, along with the hydraulic fracturing process and an increasing amount of hi-tech products including solar panels.

The exploration program consisted of hand-augering eight (8) holes to an average depth of 4.75m on the eastern target area of the tenement, which is located adjacent to Mitsubishi's large and established Cape Flattery Silica Sands mine (Figure 2).

The majority of the eight (8) auger holes returned 1m samples intervals of >99% silica oxide (SiO_2), with the drill intercepts averaging between 96.1% and 99.1% SiO_2 (see Table 1). These results are comparable with known deposits in the region. Seven (7) of the eight (8) holes ended in high-purity silica sand (Tables 1 and 2).

Hole Number	Average SiO2 (%)	Average Fe2O3 (%)	Average TiO2 (%)	Average LOI (%)	Interval Average	Sample Interval	Comment
CF191001	98.21	0.17	0.31	0.67	0m-5.0m	1.0m	Ended in high purity silica sand
CF191002	98.41	0.13	0.25	0.54	0m-5.0m	1.0m	Ended in high purity silica sand
CF191003	98.33	0.29	0.42	0.28	0m-5.0m	1.0m	Ended in high purity silica sand
CF191004	98.67	0.17	0.29	0.22	0m-5.0m	1.0m	Ended in high purity silica sand
CF191005	99.09	0.03	0.06	0.18	0m-5.0m	1.0m	Ended in high purity silica sand
CF191006	98.91	0.07	0.09	0.29	0m-5.0m	1.0m	Ended in high purity silica sand
CF191007	96.12	0.38	0.14	1.25	0m-3.0m	1.0m	Edge of target area
CF191008	98.81	0.13	0.18	0.32	0m-5.0m	1.0m	Ended in high purity silica sand

Table 1 – Average of Sampling Results per Auger Hole

Telephone: +61 7 3249 3000 | **Facsimile:** +61 7 3249 3001 | **Email:** admin@metallicaminerals.com.au
Web: www.metallicaminerals.com.au | **Postal:** GPO Box 122, Brisbane QLD 4001 | **Office:** 71 Lytton Road, East Brisbane QLD 4169

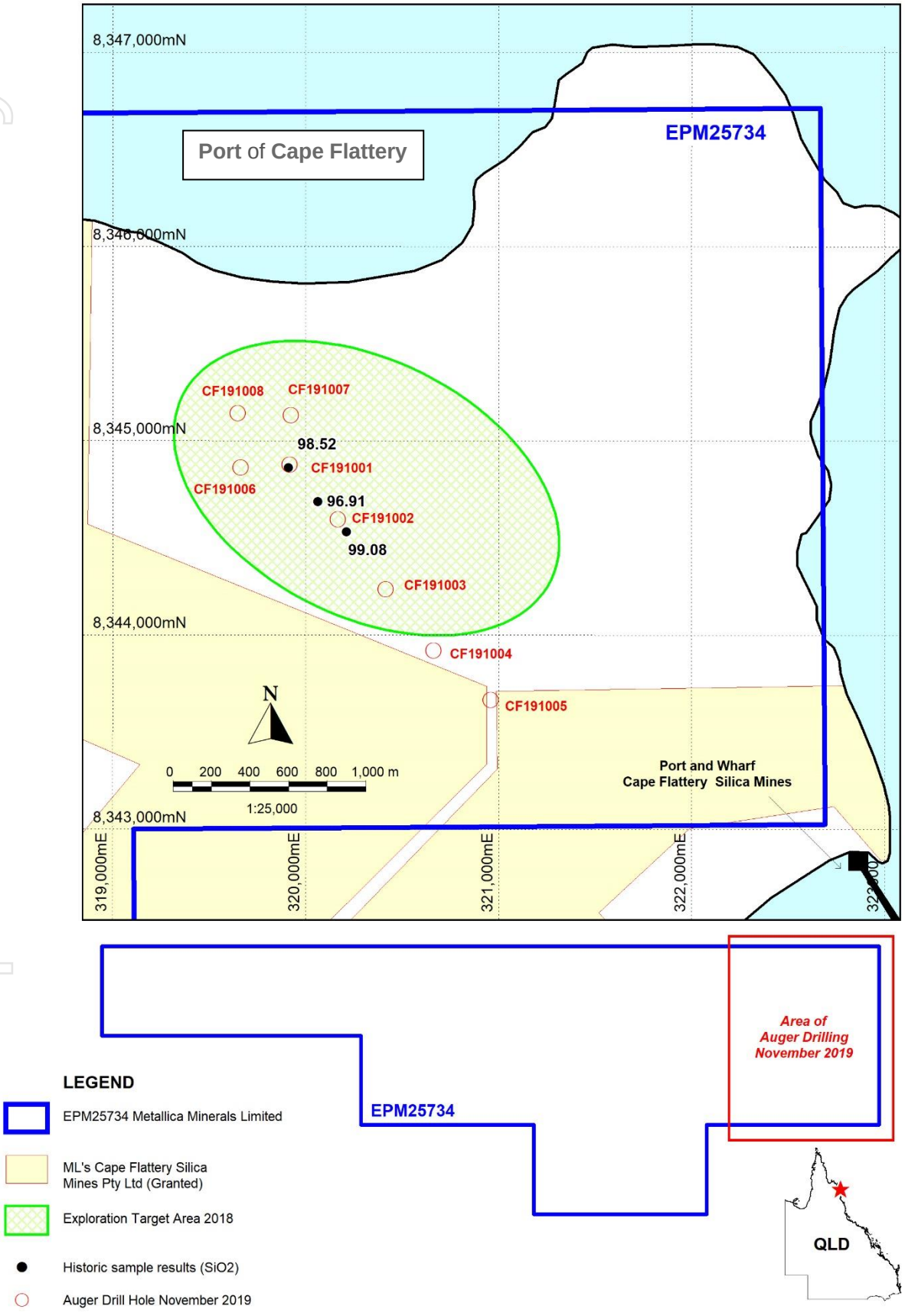

Figure 2 – Sample locations and Exploration Target Area

The aim of the 2019 auger sampling program was to:

1. Establish access to the sand dune target area
2. Confirm interpretations of the extent and potential thickness of the targeted sand dune
3. Conduct low-impact sampling using a hand-held sand auger
4. Confirm that sand quality is similar and comparable to the known Cape Flattery sand quality that is currently in the market.

Auger sampling was completed at an approximate 400-metre spacing - along existing tracks, with priority drill sites targeting the sand dunes near established and or potential export infrastructure areas.

The auger sampling was completed with a 50-millimetre shell auger up to a depth of 5m, which was the limit of practical manual augering at that time. The holes were sampled at 1-metre intervals and the data collected is sufficient for resource estimation (Figures 3 and 4).

The results indicate that the sand quality is of similar quality to the identified silica sand resources at Cape Flattery and Cape Bedford.

Next steps include:

1. Plan a further exploration program to establish a maiden silica sand resource
2. Conduct preliminary sized sand recovery test work
3. Progress the concept work currently underway on an infrastructure solution to load ocean-going vessels.

Commenting on these results, Metallica's Director and Interim CEO, Scott Waddell said:

'Metallica is very encouraged by these results that further confirm the potential of the CFSS project, particularly due to the project being adjacent to the designated Cape Flattery port area; this is expected to assist in the process for establishing an infrastructure solution to export silica sand from Cape Flattery.'

Figure 3 –Sample Auger Hole

Figure 4 –Taking of an Auger Sample

Background to the Cape Flattery Silica Sands project (CFSS)

The CFSS project is located on the coast near Cape Flattery in Far North Queensland and is adjacent to Mitsubishi's Cape Flattery Silica Sands mine, the world's largest silica sands mine.

The current CFSS sampling program focussed on the eastern most target area (approximately 1.5 km to the coastline). The previous sampling announced in April 2018 was based on reconnaissance sampling of three target areas which were previously identified with silica oxide (SiO_2) percentages of greater than 99%. These target areas form the basis for the Exploration Target [1]* developed by Metallica of 20-100 million tonnes of high purity silica sand.

High-purity silica sands are becoming more sought after, with the global market growing at a compound annual growth rate (CAGR) of around 6% between 2010 and 2017, according to industry research firm IMARC Group. In 2017, a total of 188 Mt of silica sand was produced globally.

This growth has been driven by silica sand's applications across a broad range of industries including glass-making, foundry casting, water filtration, chemicals and metals, along with the hydraulic fracturing process and an increasing amount of hi-tech products including solar panels. For example, the global glass-making industry, one of the major consumers of high-purity silica, has experienced significant growth recently as a result of demand from the construction and automotive industries.

IMARC forecasts have demand for silica sands increasing at a compound annual growth rate of 7.2% through to 2022, with annual revenues reaching US$9.6 billion.

Metallica has the advantage that the Cape Flattery silica sands have long been established in the market and are a known product amongst silica sand consumers.

The Cape Flattery dune field is extensive, covering in excess of 100 km^2. The dune field occupies a low coastal plain, with older sandstones of the Laura Basin and Hodgkinson Basin bounding its western edge and forming prominent inliers and headlands. The dune field consists predominantly of white, active, transgressive parabolic and elongate parabolic dunes, and rounded degraded dunes stabilised by vegetation, within a low-lying inter-dune sandplain interspersed with dune lakes and swamps. The elongate parabolic dunes have a nose that may reach 90m high, with trailing arms / ridges parallel to the prevailing south-easterly winds.

The dunes represent a source of high-quality silica sand, as deep leaching of the sand masses has formed a podzolic soil profile with a thick A2 horizon of white silica sand up to 40m thick. The sand has been well sorted by aeolian processes.

[1.] Refer ASX Release dated 18 April 2018.

** Cautionary Statement: an Exploration Target is a statement or estimate of the exploration potential of a mineral deposit in a defined geological setting where the statement or estimate, quoted as a range of tonnes and a range of grade (or quality), relates to mineralisation for which there has been insufficient exploration to estimate a Mineral Resource.*

Sample Number	Sample type	Easting * (AMG)	Northing * (AMG)	GPS RL * (m)	From (m)	To (m)	SiO2 (%)	Fe2O3 (%)	TiO2 (%)	LOI (%)
CF191001_1	Auger	319918	8344878	84	0	1	96.21	0.18	0.33	2.78
CF191001_2					1	2	98.54	0.22	0.42	0.19
CF191001_3					2	3	98.72	0.17	0.31	0.10
CF191001_4					3	4	98.49	0.2	0.38	0.12
CF191001_5					4	5	99.1	0.06	0.11	0.14
CF191002_1	Auger	320168	8344597	72	0	1	96.94	0.13	0.26	2.11
CF191002_2					1	2	98.49	0.15	0.3	0.30
CF191002_3					2	3	98.89	0.12	0.24	0.11
CF191002_4					3	4	98.74	0.14	0.27	0.09
CF191002_5					4	5	99.01	0.1	0.19	0.10
CF191003_1	Auger	320415	8344239	21	0	1	98.46	0.3	0.45	0.44
CF191003_2					1	2	97.44	0.39	0.59	0.52
CF191003_3					2	3	98.96	0.19	0.28	0.14
CF191003_4					3	4	98.08	0.34	0.49	0.15
CF191003_5					4	5	98.71	0.22	0.29	0.17
CF191004_1	Auger	320662	8343924	21	0	1	98.35	0.16	0.28	0.72
CF191004_2					1	2	98.65	0.19	0.34	0.14
CF191004_3					2	3	98.53	0.28	0.45	0.08
CF191004_4					3	4	98.8	0.16	0.26	0.07
CF191004_5					4	5	99.04	0.07	0.12	0.08
CF191005_1	Auger	320961	8343667	20	0	1	98.93	0.02	0.05	0.20
CF191005_2					1	2	99.42	0.02	0.03	0.09
CF191005_3					2	3	99.19	0.03	0.05	0.23
CF191005_4					3	4	99.17	0.03	0.07	0.21
CF191005_5					4	5	98.76	0.04	0.08	0.18
CF191006_1	Auger	319664	8344865	62	0	1	98.13	0.06	0.1	0.89
CF191006_2					1	2	98.74	0.05	0.09	0.14
CF191006_3					2	3	99.7	0.04	0.08	0.08
CF191006_4					3	4	99.12	0.16	0.1	0.21
CF191006_5					4	5	98.86	0.05	0.06	0.15
CF191007_1	Auger	319923	8345134	61	0	1	97.44	0.25	0.13	0.97
CF191007_2					1	2	95.01	0.52	0.15	1.83
CF191007_3					2	3	95.92	0.38	0.15	0.95
CF191008_1	Auger	319649	834145	90	0	1	98.32	0.13	0.25	0.68
CF191008_2					1	2	99.21	0.09	0.17	0.16
CF191008_3					2	3	98.87	0.16	0.17	0.36
CF191008_4					3	4	98.83	0.15	0.16	0.21
CF191008_5					4	5	98.83	0.12	0.13	0.20

**Handheld GPS Results +5m accuracy*

Table 2 – 2019 Auger Sampling Results

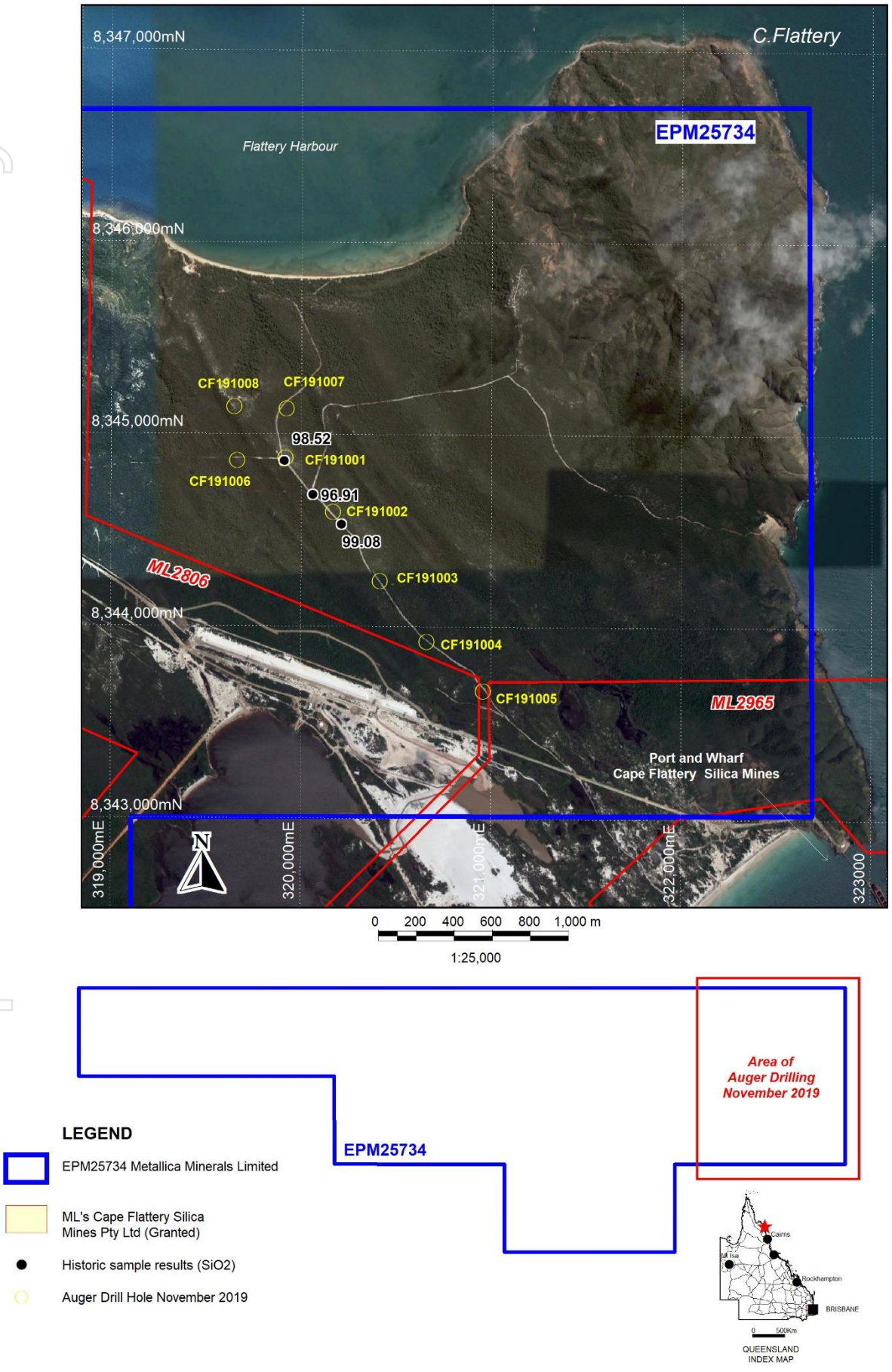

Figure 5 - Sample locations and Exploration Target Area

-ENDS-

For more information, please contact:

Metallica Minerals Ltd
Scott Waddell
Interim CEO & Director
Phone: + 61 7 3249 3000
admin@metallicaminerals.com.au

Competent Person's Statement

The information in this report that relates to Exploration Results and Exploration Targets is based on information compiled by John Cameron (a geologist of more than 25 years' experience), and a Competent Person who is a Member of the Australasian Institute of Mining and Metallurgy and a contract consultant to Metallica Minerals Ltd. Mr Cameron has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as Competent Person as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Cameron consents to the inclusion of this information in the form and context in which it appears in this release.

Caution regarding forward-looking statements

Certain statements made in this announcement contain or comprise certain forward-looking statements. Although Metallica believes that the estimates and expectations reflected in such forward-looking statements are reasonable, no assurance can be given that such expectations will prove to have been correct. Accordingly, results could differ materially from those set out in the forward-looking statements as a result of, among other factors, changes in economic and market conditions, success of business and operating initiatives, changes in the regulatory environment and other government actions, fluctuations in commodity prices and exchange rates and business and operational risk management. Metallica undertakes no obligation to update publicly or release any revisions to these forward-looking statements to reflect events or circumstances after today's date or to reflect the occurrence of unanticipated events.

Section 1 Sampling Techniques and Data

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

Criteria	JORC Code explanation	Commentary
Sampling techniques	• Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling. • Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used. • Aspects of the determination of mineralisation that are Material to the Public Report. • In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling	• Follow-up sampling of high-quality low contaminant silica sand occurrences at Cape Flattery was completed. • The program was designed to collect samples from an area of mineralisation identified in the preliminary sampling program for additional analysis to determine SiO_2 and iron and titanium oxide contamination percentages. • Hand auger samples, using a 50mm shell auger, of up to 5m down hole were collected from below the surface soil layer at 1m intervals. • Samples were submitted to commercial laboratory for drying, splitting (if required), pulverisation in a tungsten carbide bowl, and XRF analysis • Sampling techniques are mineral sands "industry standard' for dry beach sands with low levels of induration and slime.

Criteria	JORC Code explanation	Commentary
	problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.	• As the targeted mineralisation is silica sand, geological logging of the material is a primary method for identifying mineralisation
Drilling techniques	• Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).	• Sampling utilized a hand held sand auger of 50mm diameter to collect continuous samples on 1m intervals below the soil horizon.
Drill sample recovery	• Method of recording and assessing core and chip sample recoveries and results assessed. • Measures taken to maximise sample recovery and ensure representative nature of the samples. • Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.	• Sand augering was used to collect a fresh sample below the soil horizon and sand samples was retrieved from the sand auger by spilling into a clean plastic bag. • The sampling is preliminary and sampling bias was not considered and is expected to be negligible. • At this preliminary stage, no relationship is evident between sample recovery and grade
Logging	• Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies. • Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography. • The total length and percentage of the relevant intersections logged.	• Sand samples were geologically logged recording lithology, colour and grain size. • Geological and geotechnical logging was not conducted to support resource estimation, it is preliminary in scope. • Logging was qualitative in nature and based on observation by an experienced geologist. • Geological logs are captured in Excel spreadsheets and saved on the Company' s file server.
Sub-sampling techniques	• If core, whether cut or sawn and whether quarter, half or all core taken.	• No sub-sampling was completed, all samples were submitted for sample preparation whole.

Criteria	JORC Code explanation	Commentary
and sample preparation	• If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry. • For all sample types, the nature, quality and appropriateness of the sample preparation technique. • Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples. • 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. • Whether sample sizes are appropriate to the grain size of the material being sampled.	• Sample size is considered appropriate for the material sampled. • Where topsoil was present, it was discarded as it was not representative of the underlying sand dune material.
Quality of assay data and laboratory tests	• The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total. • 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. • Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.	• Samples were submitted to ALS Townsville, where they were dried, weighed and split. • Analysis was undertaken by ALS Brisbane utilizing a Tungsten Carbide pulverization, ME-XRF26 (whole rock by Fusion/XRF) and ME-GRA05 (H_2O/LOI by TGA furnace). • Due to the preliminary nature of the program no blanks, standards or duplicates were analysed.
Verification of sampling and assaying	• The verification of significant intersections by either independent or alternative company personnel. • The use of twinned holes.	• Sampling is preliminary and the results are used to confirm the existence of silica sand and used to design an exploration program to better quantify silica sand quantity and quality.

Criteria	JORC Code explanation	Commentary
	• Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols. • Discuss any adjustment to assay data.	• Significant intersections were validated against the geological logs and current geological model. • All data captured is stored in both hard copy and electronic format
Location of data points	• Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation. • Specification of the grid system used. • Quality and adequacy of topographic control.	• All sample locations were surveyed using a handheld GPS accurate to within ±5m for Eastings and Northings. • UTM coordinates, Zone 55L, GDA94 datum.
Data spacing and distribution	• Data spacing for reporting of Exploration Results. • Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied. • Whether sample compositing has been applied.	• Sampling pattern was designed to test the Target area generated based on the preliminary sampling results coupled with aerial photography. • The Target area was tested in 8 location at an approximate spacing of 400m centres.
Orientation of data in relation to geological structure	• Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type. • If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.	• The dune field has ridges dominantly trending 320° - 330°. • Access tracks in the area generally follow the dune crests and cross perpendicular to the dunes which allows for unbiased sampling. .
Sample security	• The measures taken to ensure sample security.	• .Sample collection and transport from the field was supervised by company representatives.

Criteria	JORC Code explanation	Commentary
		• The samples were transported to ALS Laboratory in Townsville and were delivered to ALS sample prep staff by company representatives.
Audits or reviews	• The results of any audits or reviews of sampling techniques and data.	• Due to the preliminary nature of this program, no review or audits have been completed of the sampling techniques and data.

Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings. • The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.	• The tenement is known as EPM 25734 "Cape Flattery" and is located north of the regional town of Cooktown in Far North Queensland. • The tenement is held 100% by Oresome Australia Pty Ltd which is a wholly owned subsidiary of Metallica Minerals Ltd • The EPM encircles the northern boundaries of the Established Mining Leases of Cape Flattery Mineral Sands project at Cape Flattery. • Due to the square shape of sub blocks, portions of some blocks extend off-shore and overlap Category A environmentally sensitive areas. • All mineral exploration will be on-shore.
Exploration done by other parties	• Acknowledgment and appraisal of exploration by other parties.	• The tenement has been previously explored with the last phase of exploration completed in the 1980s.

Criteria	JORC Code explanation	Commentary
		• Historical exploration data is limited to the nearby Mining Lease areas and as such kept out of the public domain whilst the Mining Leases are granted.
Geology	• Deposit type, geological setting and style of mineralisation.	• The silica sands are part of a Quaternary dune field occupying a low coastal plain, with older sandstones of the Laura Basin and Hodgkinson Basin bounding its western edge and forming prominent outliers and headlands. • The dune field consists predominantly of white, active, transgressive parabolic and elongate parabolic dunes, and rounded degraded dunes stabilised by vegetation. • Interdune sandplain interspersed with dune lakes and swamps. The elongate parabolic dunes have a nose that may reach 90m high, with trailing arms / ridges parallel to the prevailing south-easterly winds. • The dunes represent a source of high quality silica sand, as deep leaching of the sand masses has formed a podzolic soil profile with a thick horizon of white silica sand locally up to 40m thick. • The sand has been well sorted by aeolian processes and the grain size distribution is well sorted.

Drill hole Information	• A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:
	  ○ easting and northing of the drill hole collar
	  ○ elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar
	  ○ dip and azimuth of the hole
		• Sampling location and results are tabulated in the text (Table 2) detailing sample coordinates.
		• All auger holes were augured vertically (-90°).
		• The adjacent sand mine routinely removes and stockpiles 300mm of topsoil for later re-use for rehabilitation and this is not included in their resource estimates.

Criteria	JORC Code explanation	Commentary
	○ down hole length and interception depth ○ hole length. • If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.	
Data aggregation methods	• In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated. • Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail. • The assumptions used for any reporting of metal equivalent values should be clearly stated.	• Data is reported as received from the laboratory no averaging or other aggregations, other than where this is noted in the report, such as the averages in Table 1.
Relationship between mineralisat-ion widths & intercept lengths	• These relationships are particularly important in the reporting of Exploration Results. • If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported. • If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').	• The preliminary nature of sampling infers no relationship between mineralisation and sample interval. • Sampling is to determine if sand quality has potential mineralisation quality.

Criteria	JORC Code explanation	Commentary
Diagrams	• Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.	• A map showing the auger hole locations relative to the EPM boundaries is provided within the main body of the announcement. • There is insufficient data to generate sections as all data is limited to near surface.
Balanced reporting	• Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.	• All exploration results received have been reported.
Other substantive exploration data	• Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	• Geological observations are consistent with aeolian dune mineralisation • No bulk density measurements have been undertaken. • The mineralisation is unconsolidated sand. • There are no known deleterious substances at this time. • No metallurgical test work is planned at this preliminary stage.
Further work	• The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling). • Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	• Further drilling (hand auger and/or aircore) to test for depth and lateral extensions of potential mineralisation is currently being planned.