FIREBIRD MFP PRECURSOR CAM OUTPERFORMS CHINA INDUSTRY STANDARDS

Highlights

- MFP PCAM produced using **Firebird's proprietary concentrate to cathode process** technology
- Internal and third-party testing **confirms improvement over several key performance** parameters for its MFP PCAM versus China industry standards
- **More than 150 individual test batches** completed, producing**~200kg of MFP PCAM**
- 30kg of MFP PCAM supplied to a potential downstream customer for LMFP cathode production, **with initial coin-cell testing** indicating **excellent material performance**
- **Production of MFP PCAM, CAM and other high purity battery materials is targeted at Firebird's Australian Demonstration Plant (ADP) in 2026**
- The ADP will deliver a fully **integrated commercialisation pathway** from manganese concentrate to LMFP cathode materials tailored to Western markets

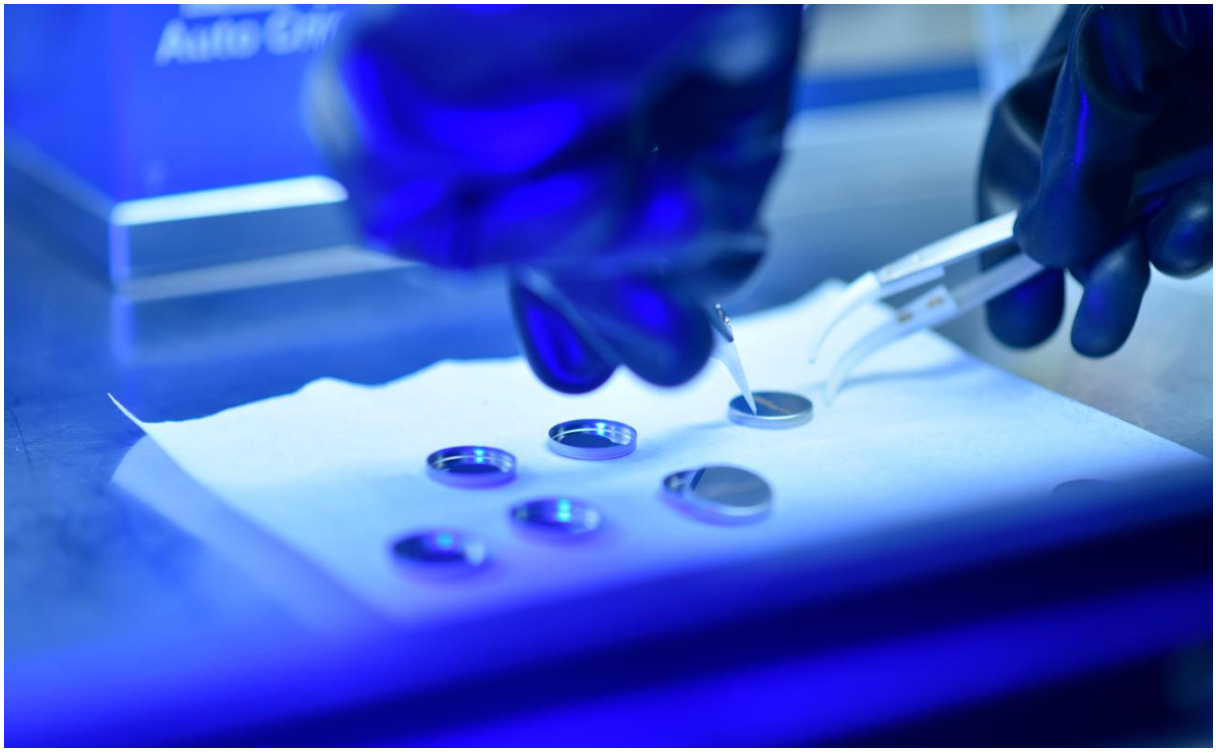


Figure 1. LMFP coin cell batteries incorporating Firebird's proprietary battery materials.

Firebird CEO, Mr Ron Mitchell, commented:

"Achieving performance improvement over China industry standards, across multiple parameters, is a significant technical milestone for Firebird and a strong validation of our proprietary battery materials production process. The results, supported by both internal and independent testwork, give us confidence that our MFP precursor can meet the demanding requirements of LMFP cathode producers. With more than 150 test batches completed, 200 kilograms of material produced and 30 kilograms already in the hands of a potential downstream customer, we are now focused on translating this technical success into commercial outcomes as we progress toward commissioning our Australian Demonstration Plant in 2026."

Australian-owned Firebird Metals Limited (ASX: FRB, Firebird or the Company) is pleased to provide the following update.

MFP precursor testing results exceed China industry standards

Most solution-based lithium manganese iron phosphate (LMFP) manufacturing routes rely on externally sourced electrolytic manganese metal (EMM) or high-purity manganese sulphate monohydrate (HPMSM). By contrast, Firebird leverages its proprietary HPMSM production technology to utilise HPMSM solution *prior to crystallisation* to produce MFP precursor (PCAM).

This approach delivers several advantages:

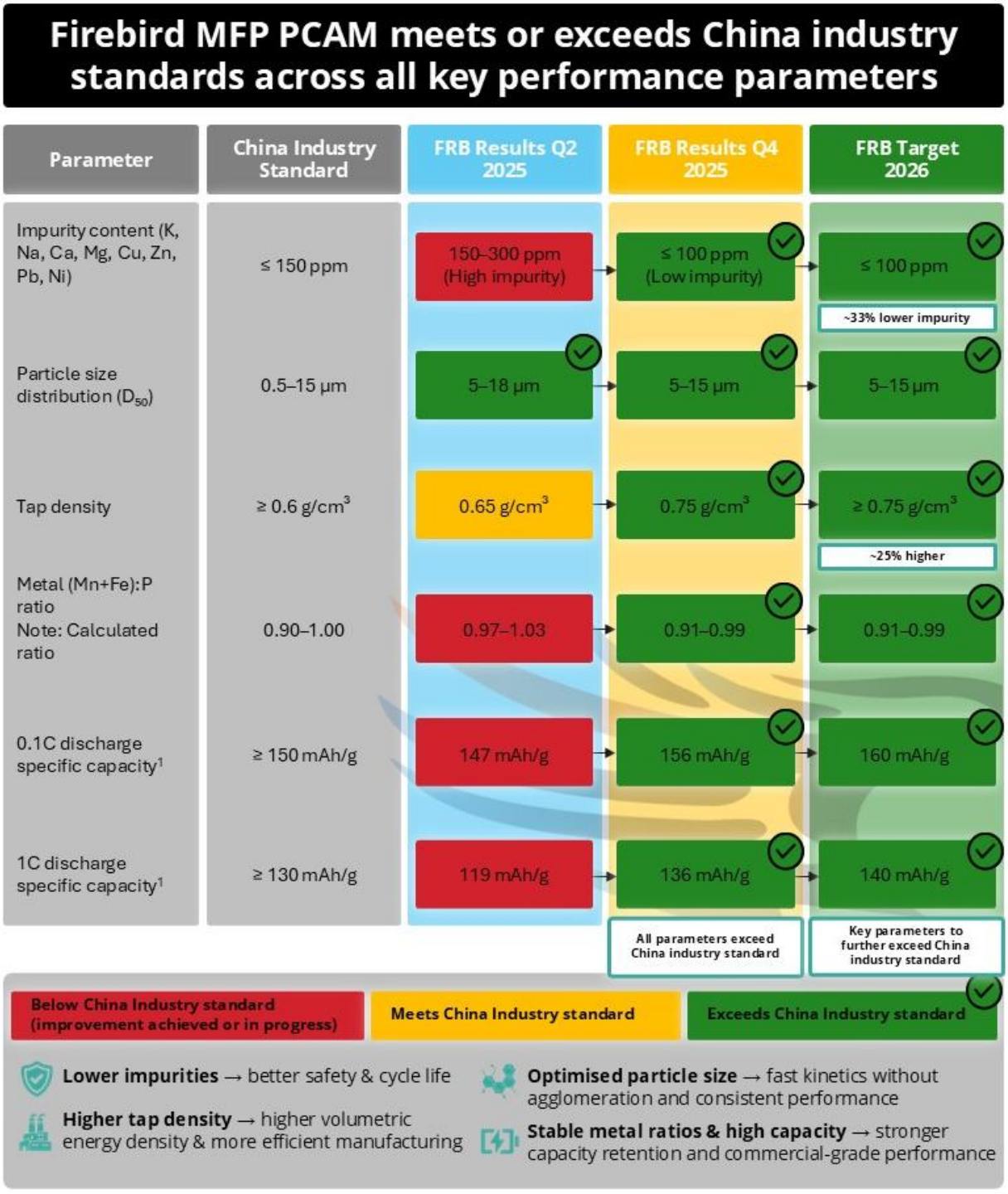
- **Lower raw-material costs**
- **Removal of the crystallisation step**, reducing CapEx and OpEx
- **Improved process efficiency**, with fewer unit operations
- **Enhanced control over precursor quality**

Using HPMSM directly in solution also enables more precise atomic-level Mn:Fe ratio control during co-precipitation. This results in superior MFP consistency and produces a higher-quality precursor and final LMFP cathode material.

From a commercialisation standpoint, the process is readily scalable and more closely aligned with contemporary cathode-manufacturing requirements.

Testwork completed at Firebird's China laboratory has demonstrated an improvement over several key performance parameters compared with China national industry standards and customer requirements (Table 1).

Table 1. The Company's precursor LMFP testing results compared with China industry standards T/CIAPS0029—2023[1] *and customer requirements.*



[1] Tested as per Chinese standard **T/CIAPS0029—2023 Appendix C.6** Specific capacity tested at 25 degrees celcius and 4.5 volts.

Key parameters of MFP PCAM testing

There are several critical process parameters that influence the performance of MFP PCAM. Through an extensive test program comprising more than 150 individual batch runs and producing approximately 200kg of MFP PCAM, Firebird has developed specialist know-how and deep technical expertise in optimising these parameters. This body of work underpins the Company's proprietary understanding of MFP precursor production and is summarised in Table 2.

Table 2. Key technical parameters impacting MFP PCAM performance.

Item	Technical significance
PH Levels	The precursor particle morphology can be effectively controlled by precisely adjusting the pH during co-precipitation.
Temperature	Mn and Fe elements exhibit a highly uniform distribution within the precursor particles, while the spatial distribution of P coincides precisely with that of the metal ions (Mn + Fe), indicating the formation of a stoichiometric phosphate compound.
Mixing speed	The intense turbulence generated by stirring not only effectively suppressed crystal growth but also promoted secondary nucleation, thereby achieving a narrow particle size distribution.
MnFe:P ratio	Critical to control this ratio for the performance of LMFP
Impurities removal from different sources	Flexible in using a variety of input materials and ability to remove impurities effectively.

Figure 2. The Company's patented precursor MFP reactor vessel.

MFP Precursor to be manufactured at the ADP

The ADP will be Australia's first demonstration-scale facility capable of converting manganese ore into High-Purity Manganese Sulphate Monohydrate (HPMSM) and subsequently synthesising Manganese Iron Phosphate (MFP) Precursor Cathode Active Material (PCAM) and Cathode Active Material (CAM) using patented and proprietary equipment and processing techniques (Fig. 2 and 3).

The integrated flowsheet converts manganese ore to HPMSM and then to MFP PCAM and CAM. A key innovation of the combined HPMSM/MFP PCAM process is the **retention of manganese sulphate in solution between stages**, eliminating the need to crystallise HPMSM as an intermediate product. This approach:

- reduces energy consumption;
- simplifies material handling;
- lowers capital intensity; and
- improves overall process efficiency.

Figure 3. The ADP production process pathway showing the production of MFP PCAM and CAM.

Successful ADP validation will:

- **Establish a training, knowledge-transfer and development hub**, building local capability in HPMSM, precursor and CAM production while supporting customer-specific R&D. This platform strengthens Firebird's capacity to independently develop, refine and patent new technologies within Australia.
- **Provide the technical foundation for commercial-scale feasibility studies** for a concentrate-to-cathode process using Oakover ore as the preferred feed source.

- **Enhance customer engagement** by supplying Australian-made samples to initiate qualification programs with Western partners.
- **Support progression toward contractual offtake agreements and/or JV partnerships** with reputable tier-one Western counterparties.
- **De-risk the pathway to a commercial-scale manganese battery-materials facility in Australia**, ensuring a smoother transition from demonstration to full-scale production.

This announcement has been authorised for release by the Board of Firebird Metals Limited.

For further information contact:

Ron Mitchell
CEO
E: ron.mitchell@firebirdmetals.com.au
Ph: +61 407 726 325

About Firebird Metals Limited (ASX:FRB)

Firebird Metals is an integrated manganese technology company positioned in the EV and energy-storage markets.

The Company's state-of-the-art lab and research facility demonstrate full flow-sheet capability, from manganese ore to finished battery active cathode materials. Firebird pairs downstream processing know-how with proprietary technologies, including a high-efficiency kiln and advanced crystallisation, targeting lower cost and energy use and enabling near-term revenue via equipment sales and licensing.

Firebird is advancing an lithium manganese iron phosphate (LMFP) pathway to near-term production of high-purity manganese sulphate and an LMR program for next-generation cathodes.

Firebird also holds 234 Mt of manganese resources in Western Australia, led by Oakover (176.7 Mt at 9.9% Mn, including Indicated 105.8 Mt at 10.1% Mn[2]) and Hill 616 (57.5 Mt at 12.2% Mn[3]). The Company has the flexibility to source manganese ore through third-party suppliers and stockpiles, with mining optionality retained within its broader portfolio.

JORC Compliance Statement

This announcement contains references to Mineral Resource Estimates, which have been reported in compliance with Listing Rule 5.8 and extracted from previous ASX announcements as referenced.

The Company confirms that it is not aware of any new information or data that materially affects the information previously reported and that all material assumptions and technical parameters underpinning the Mineral Resource Estimates continue to apply and have not materially changed.

Competent Persons Statement (Metallurgical Test Work)

The information in this report that relates to metallurgical test work results is based on information reviewed by Mr Phil Dundas, who is a Member of the Australasian Institute of Mining and Metallurgy. Mr Dundas is an employee of Sedgman Pty Ltd and consultant to Firebird Metals Limited. Mr Dundas is a qualified chemical engineer and has sufficient experience which is relevant to the supervision and interpretation of test work activities undertaken to qualify as a Competent Person as defined by the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the JORC Code, 2012 Edition). Mr Dundas consents to the inclusion in the announcement of the matters based on the reviewed information in the form and context in which it appears.

[2] See ASX announcement dated 23 March 2023: Indicated Resource of 105.8Mt at 10.1%; Inferred Resource of 70.9Mt at 9.6% for global Resource of 176.7 Mt at 9.9% Mn.
[3] See ASX announcement dated 1 December 2021: Inferred Resource of 57.5 Mt at 12.2% Mn.

Appendix A – JORC Table 1

JORC Table 1 Section 1 – Sampling Techniques and Data

Criteria	JORC Code explanation	Commentary
Sampling techniques	*Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as downhole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.*	Not Applicable. Materials used to present metallurgical study results in this announcement were sourced from commercial third party manufacturers of refined chemicals.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	Not Applicable. Materials used to present metallurgical study results in this announcement were sourced from commercial third party manufacturers of refined chemicals.
	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 (e.g. '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 problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information	Not Applicable. Material used in the studies presented in this announcement are commercially available chemical compounds, sourced from third party suppliers. Primary Mineralisation was not sampled.
Drilling techniques	*Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. 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.).*	Not Applicable. No sampling from drilling is presented in this announcement.

Criteria	JORC Code explanation	Commentary
Drill sample recovery	*Method of recording and assessing core and chip sample recoveries and results assessed.*	Not Applicable. No sampling from drilling is presented in this announcement.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	Not Applicable. No sampling from drilling is presented in this announcement.
	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.	Not Applicable. No sampling from drilling is presented in this announcement.
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.*	Not Applicable. No sampling from drilling is presented in this announcement.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	Not Applicable. No sampling from drilling is presented in this announcement.
	The total length and percentage of the relevant intersections logged.	Not Applicable. No sampling from drilling is presented in this announcement.
Subsampling techniques and sample preparation	*If core, whether cut or sawn and whether quarter, half or all core taken.*	Not Applicable. No sampling from drilling is presented in this announcement.
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	Not Applicable. No sampling from drilling is presented in this announcement.

Criteria	JORC Code explanation	Commentary
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	Not Applicable. No sampling from drilling is presented in this announcement.
	Quality control procedures adopted for all subsampling stages to maximise representivity of samples.	Not Applicable. No sampling from drilling is presented in this announcement.
	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.	Not Applicable. No sampling from drilling is presented in this announcement.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	Not Applicable. No sampling from drilling is presented in this announcement.
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.*	Not Applicable. No analyses of primary samples from drilling are presented in this announcement.
	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.	Not Applicable. No analyses of primary samples from drilling are presented in this announcement.
	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.	Not Applicable. No analyses of primary samples from drilling are presented in this announcement.

Criteria	JORC Code explanation	Commentary
Verification of sampling and assaying	*The verification of significant intersections by either independent or alternative company personnel.*	Not Applicable. No analyses of primary samples from drilling are presented in this announcement.
	The use of twinned holes.	Not Applicable. No analyses of primary samples from drilling are presented in this announcement.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	Not Applicable. No analyses of primary samples from drilling are presented in this announcement.
	Discuss any adjustment to assay data.	Not Applicable. No analyses of primary samples from drilling are presented in this announcement.
Location of data points	*Accuracy and quality of surveys used to locate drillholes (collar and downhole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.*	Not Applicable. No analyses of primary samples from drilling are presented in this announcement.
	Specification of the grid system used.	Not Applicable. No drilling or sampling data is presented in this announcement.
	Quality and adequacy of topographic control.	Not Applicable. No analyses of primary samples from drilling are presented in this announcement.
Data spacing and distribution	*Data spacing for reporting of Exploration Results.*	Not Applicable. Not Reporting 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.	Not Applicable. Not Reporting Exploration Results.
	Whether sample compositing has been applied.	Not Applicable. Not Reporting Exploration Results.

Criteria	JORC Code explanation	Commentary
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.*	Not Applicable. Not Reporting Exploration Results.
	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.	Not Applicable. Not Reporting Exploration Results.
Sample security	*The measures taken to ensure sample security.*	Not Applicable. Not Reporting Exploration Results.
Audits or reviews	*The results of any audits or reviews of sampling techniques and data.*	Not Applicable. Not Reporting Exploration Results.

JORC 2012 Table 1 Section 2 – Reporting of Exploration Results

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.*	Not Applicable. The work presented in the body of this announcement is not directly related to a Mineral Resource or Exploration Project.
	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.	Not Applicable. The work presented in the body of this announcement is not directly related to a Mineral Resource or Exploration Project.

Criteria	JORC Code explanation	Commentary
Exploration done by other parties	*Acknowledgment and appraisal of exploration by other parties.*	Not Applicable. The work presented in the body of this announcement is not directly related to a Mineral Resource or Exploration Project.
Geology	*Deposit type, geological setting and style of mineralisation.*	Not Applicable. The work presented in the body of this announcement is not directly related to a Mineral Resource or Exploration Project.
Drillhole Information	*A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drillholes:* *Easting and northing of the drillhole collar* *Elevation or RL (Reduced Level – elevation above sea level in metres) of the drillhole collar* *Dip and azimuth of the hole* *Downhole length and interception depth* *Hole length.*	Not Applicable. Not Reporting Exploration Results.
	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.	Not Applicable. Not Reporting Exploration Results.
Data aggregation methods	*In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.*	Not Applicable. Not Reporting Exploration Results.
	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.	Not Applicable. Not Reporting Exploration Results.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	Not Applicable. Not Reporting Exploration Results.

Criteria	JORC Code explanation	Commentary
Relationship between mineralisation widths and intercept lengths	*These relationships are particularly important in the reporting of Exploration Results.*	Not Applicable. Not Reporting Exploration Results.
	If the geometry of the mineralisation with respect to the drillhole angle is known, its nature should be reported.	Not Applicable. Not Reporting Exploration Results.
	If it is not known and only the downhole lengths are reported, there should be a clear statement to this effect (e.g. 'downhole length, true width not known').	Not Applicable. Not Reporting Exploration Results.
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 drillhole collar locations and appropriate sectional views.*	Relevant diagrams are included in the body of this announcement.
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.*	Not Applicable. Not Reporting Exploration Results.
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.*	Firebird Metals Limited is conducting proof-of-concept flowsheet testwork to produce lithium manganese iron phosphate (LMFP) cathode active material (CAM) in a new process that directly integrates the generation of precursor manganese sulphate into the production of the manganese-iron phosphate (MFP) pre-cathode active material (pCAM) production. This work, and the flowsheet being developed demonstrates and ability to produce CAM from commercially purchased, refined chemicals from third party independent suppliers. The process requires the following chemicals, which Firebird have sourced from the listed suppliers: **Raw Material** / **Company** $MnSO_4.H_2O$ / ISKY Chemicals Co. Ltd $FeSO_4.7H_2O$ / Qianjiang Fangyuan Titanium Industry Co., Ltd $NH_4H_2PO_4$ / Hubei Ezhong Ecology $NH_3.H_2O$ / Hunan Jinniu Chemical Co., Ltd.

Criteria	JORC Code explanation	Commentary
		Li_2CO_3 — Hunan Tiantai Tianrun Amperex Technology Co., Ltd $C_6H_{12}O_6$ — Aladdin
Further work	*The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).*	Not Applicable. Not Reporting Exploration Results.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	Not Applicable. Not Reporting Exploration Results.