BIRIMIAN

ASX Announcement ASX BGS

INITIAL PROOF OF CONCEPT STUDY DEMONSTRATES SUITABILITY OF CONCENTRATE FOR BATTERY CHEMICALS

3 December 2018

Birimian Limited (ASX: BGS, **Birimian** or the **Company**) is pleased to announce the following results from initial "proof of concept" test work for the conversion of a spodumene sample from the Goulamina Lithium Project (the **Project**) to lithium carbonate (**Li_2CO_3**).

The test work program was of a preliminary nature and undertaken in parallel with the further metallurgical testwork program required for the Feasibility Study for the Project. The work was conducted at the ALS Balcatta laboratories, on a small sample of 1.5kg of flotation concentrate that was produced during the earlier metallurgical test work program completed for the Pre-Feasibility Study (PFS) (ASX: BGS July 4, 2018 Goulamina Updated PFS Delivers Strong Project Outcomes). As this was limited initial test work on a small sample further testwork and analysis of Goulamina spodumene is warranted.

The Company is pleased to advise that this preliminary testwork confirmed the 6% spodumene concentrate sample from the Project can be converted to a product that contains 99.65% Li_2CO_3. The generally accepted industry standard for "battery grade" Li_2CO_3 is a minimum 99.50% Li_2CO_3[1].

The principal conclusions of the test work report are:

- Calcination (betaisation) of Goulamina spodumene concentrate to convert the natural alpha-spodumene to beta-spodumene demonstrated 100% conversion to beta-spodumene, indicating that materially all lithium present is present as spodumene;
- Betaisation of a bulk concentrate sample, followed by sulphation roasting, leaching, impurity removal, evaporation, precipitation and bicarbonation achieved an overall lithium extraction of 82.66%;
- Li_2CO_3 product contained >99.5% Li_2CO_3;
- Some impurities were higher than the battery grade specifications, due to the limits of the test work procedure, the current flowsheet assumed and the operating conditions of the individual process steps not having been optimised;
- It is reasonable to expect that with minor changes to the flowsheet used for this "Proof of Concept" test work and optimisation of some of the process steps that spodumene concentrate from Goulamina will produce battery grade lithium carbonate or hydroxide;
- Goulamina spodumene concentrate, as tested in this program, is suitable for conversion to lithium carbonate via conventional processing routes; and
- Further test work on a conversion option for Goulamina spodumene is warranted

Mark Hepburn
Executive Director and Chief Executive Officer
Birimian Limited

[1] Reference is Chinese standard for battery grade lithium carbonate YS/T582 (2013).

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Competent Person's Declaration (Metallurgical Results)

Information in this announcement relating to the Goulamina Lithium Project is based on technical data compiled or supervised by Mr Darryl Butcher, an Independent Consultant trading as BDB Process Pty Ltd. Mr Butcher is a Fellow of The Australasian Institute of Mining and Metallurgy (AusIMM). Mr Butcher has sufficient experience which is relevant to primary concentrator metallurgy and hydrometallurgy from the style of mineralisation and type of deposits under consideration and to the activity which they are undertaking to qualify as a Competent Persons under the 2012 Edition of the 'Australasian Code for reporting of Exploration Results, Mineral Resources and Ore Reserves'. This includes over 20 years of experience in primary concentrator process development, design, project implementation and operations and hydrometallurgical process development, design, project implementation and operations. Mr Butcher consents to the inclusion in the announcement of the matters based on this information in the form and context in which it appears.

JORC Code, 2012 Edition – Table 1

Section 1 Sampling Techniques and Data

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 (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.*	• The sample used for this proof of concept study comprised 1.5kg of flotation concentrate generated during the metallurgical testwork undertaken for the Goulamina Prefeasibility Study (**PFS**) (ASX: BGS 4th July 2018). Consequently, it is not necessarily representative of spodumene concentrate that may be produced by a future processing operation. • For the purposes of this study, the sample did not need to be representative of any specific Mineral Reserve or Mineral Resource domain of the Project. • The sample used had been kept in storage by ALS since its generation in the PFS. • The sample lithium grade at 5.9% Li_2O was similar to that which is expected to be generated by a future project.
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).*	• No drilling was undertaken.
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.*	• No drilling was undertaken.
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.*	• No drilling was undertaken and consequently, no logging.
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.* • *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*	• No drilling was undertaken. • The sample used was the product of earlier test work undertaken for the PFS. • No subsampling was required and none was undertaken. • As this was a proof of concept study only, no duplicate tests were undertaken.

Criteria	JORC Code explanation	Commentary
	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.*	• The sample was considered to be appropriate in size and nature for the work undertaken. • The sample was dried in preparation for the testwork using the ALS standard sample drying technique appropriate for this type of sample and this type of testing.
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 (i.e. lack of bias) and precision have been established.*	• Analysis for lithium and a suite of other elements on the head sample was undertaken at ALS Perth by ICP-AES after Sodium Peroxide Fusion. Detection limits for lithium are 0.01-10%. • Sodium Peroxide fusion is considered a "total" assay technique for lithium. • Analysis on products was undertaken utilising ICP-AES or XRF. • No geophysical tools or other non-assay instrument types were used in the analyses reported. • Quality control and assay procedures are covered by ALS's NATA Accreditation.
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.* • *The use of twinned holes.* • *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.* • *Discuss any adjustment to assay data.*	• No drilling was undertaken.
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.*	• No drilling was undertaken.
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.*	• No drilling was undertaken.
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*	• No drilling was undertaken.

Criteria	JORC Code explanation	Commentary
	assessed and reported if material.	
Sample security	) *The measures taken to ensure sample security.*	) The sample used was stored under secure storage by ALS subsequent to its generation in the prior PFS testwork and drawn from storage by ALS to undertake this work.
Audits or reviews	) *The results of any audits or reviews of sampling techniques and data.*	) The report for this testwork has been reviewed by Ausenco Ltd, an independent third party.

Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

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 reported results are from an area within the Torakoro Permit, which is held 100% by Timbuktu Resources SARL, a member of the Birimian Limited group of companies.) Tenure is in good standing.
Exploration done by other parties	) *Acknowledgment and appraisal of exploration by other parties.*	) Not applicable. Copied direct from Pure Minerals table – not applicable because no drilling undertaken.
Geology	) *Deposit type, geological setting and style of mineralisation.*	) Not applicable. As above.
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:* o *easting and northing of the drill hole collar* o *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar* o *dip and azimuth of the hole* o *down hole length and interception depth* o *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.*	) No drilling was undertaken.) Metal equivalents were not used or reported.
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.*) *Where aggregate intercepts incorporate short lengths of high grade results and*	) No drilling was undertaken.

Criteria	JORC Code explanation	Commentary
	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.*	
Relationship between mineralisation widths and 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 (e.g. 'down hole length, true width not known').*	• Not applicable. No drilling completed
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.*	• No new drillhole information is reported in this press release; all historical drilling information, including maps and sections, has been previously reported in multiple ASX releases during 2017 and 2018.
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. No drilling completed and the reporting provided on the one sample in question is comprehensive
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.*	• Not applicable. No drilling undertaken
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).* • *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	• No further work is planned at this time.