BLACK CANYON

ASX Announcement

12 October 2022

Successful manganese extraction from initial leaching tests - Amended

Black Canyon Limited (ASX: BCA) provides an amended announcement "Successful manganese extraction from initial leaching tests" which was released on 11 October 2022.

This amended announcement includes Appendix 1 - Flanagan Bore diamond drill core collar information and Appendix 2, JORC 2012 table.

Jay Stephenson
Company Secretary

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October 11 2022 ASX:BCA

Successful manganese extraction from initial leaching tests

HIGHLIGHTS

- Early-stage leaching testwork completed on a global composite sample from the Flanagan Bore Manganese Project has achieved up to **91% manganese leach extraction**
- Initial leach tests were completed as part of commencing a **High Purity Manganese Sulphate Monohydrate (HPMSM)** Scoping Study using manganese oxide ores
- These results are considered highly encouraging at an early stage and a more comprehensive program is planned to optimise the physical and chemical test conditions to further improve leaching kinetics
- The manganese-rich solution produced from this testwork will be used to generate manganese sulphate crystals and provide detailed chemical analysis on the product, critical to understanding the purification processes required to achieve HPMSM
- The Company has commenced additional Scoping Level testwork programs as part of the overall strategy to add value through the potential production of **HPMSM as a precursor material for cathodes** used in the growing electric vehicle battery market
- Black Canyon has the mineral resource base to potentially develop a **multi-decade mining operation that could supply manganese oxide concentrates for steel production and downstream production of HPMSM**

Black Canyon Executive Director, Brendan Cummins, said: *"We are very excited to be pursuing the potential for a multi-decade mining project at Flanagan Bore that can generate substantial manganese oxide concentrates for the steel industry but also provide a reliable feedstock to produce high purity manganese sulphate over the long term. Whilst we recognise it is early days, confirming the leachability of the manganese oxide ores is strongly encouraging and we have commenced more detailed hydrometallurgical studies to support a HPMSM Scoping Study with demand for manganese in electric vehicle NMC and LFMP battery chemistries predicted to grow significantly in the coming years."*

"This parallel downstream strategy is considered highly complementary to our ongoing mine development activities and could add significant value across our manganese business over time."

Australian manganese explorer, Black Canyon Limited (**Black Canyon** or **the Company**) (ASX:**BCA**), is pleased to announce initial leaching testwork has delivered highly promising results, achieving up to 91%

Manganese (Mn) leach extraction. The success of the leaching testwork builds upon the completion of the positive Scoping Study on the Flanagan Bore development project, which examined producing manganese concentrate primarily for the steel market.

The Company has a parallel strategy to produce HPMSM, commencing with this initial leach and crystallisation testwork. This will be followed with more detailed Scoping Level leaching, purification and crystallisation of potential battery grade manganese sulphate over the coming months.

Flanagan Bore is part of the Company's Carawine JV and is subject to a farm-in and joint venture agreement with Carawine Resources Ltd (ASX:CWX). Having earned a 51% interest, Black Canyon is now earning up to 75% in the Carawine Project tenements by sole-funding an additional $2.5m of exploration expenditure. The Flanagan Bore Project is located approximately 400 km southeast of Port Hedland in the east Pilbara region of Western Australia.

Leaching Testwork Objective

The objective of the initial testwork was to establish the leaching amenability of manganese oxide ores using fairly standard chemical and physical parameters to determine extraction kinetics based on feedstock particle size, slurry density and SO_2 concentration. The manganese-rich solution will also be crystallised and analysed in order to further understand the overall Mn purity and contaminant levels.

The learnings from the initial leach and crystallisation tests can then be applied to further ongoing detailed leaching, purification and crystallisation testwork to support a HPMSM Scoping Study. The Company has commenced this second stage of a hydrometallurgical testwork program with the preparation of suitable manganese oxide materials from LR1 and FB3.

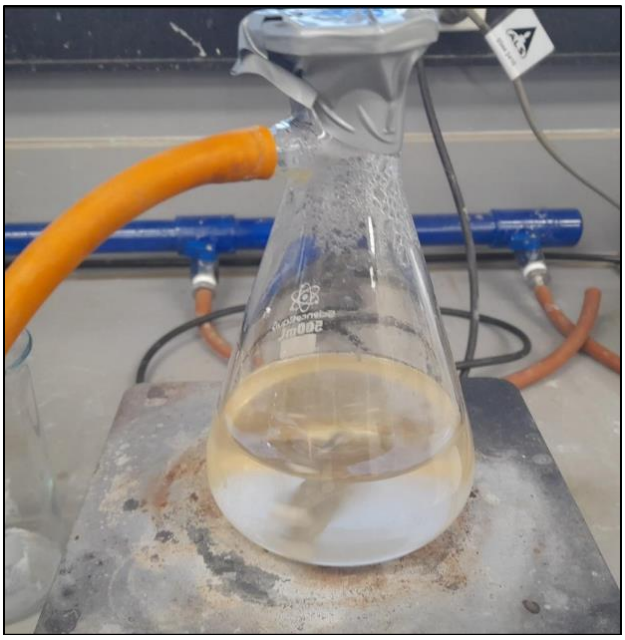

Figure 1. Mn leachate from the initial testwork completed using manganese oxide ore

Leach Extraction Testwork

A global composite was tested from across the LR1 and FB3 deposits within Flanagan Bore.

The leach tests were undertaken on fines of manganese concentrate composites produced from previous beneficiation testwork. The samples tested are considered relatively coarse (-2mm fraction) and had a feed head grade of 29% Mn. The leach tests completed at ALS Metallurgy in Perth were based on a standard SO_2 reductive leach with varied pulp densities and SO_2 addition ratios. Manganese leach extraction of up to 91.1% was achieved at a stoichiometric SO_2 addition rate of 161%.

The initial leaching testwork is not considered optimal with the experimental conditions (pulp density and SO_2 addition) varied to assess the impact on leachability. On this basis, the manganese extraction rates ranged from 21.5%, 72.6%, 89.0% and 91.1%.It was observed that higher extractions are achieved with lower pulp densities and higher SO_2 addition. Further test work will now look to optimise the leaching conditions including grind size, reagent addition, temperature and pulp density to further improve leaching rates.

As part of the second stage testwork program to support a HPMSM Scoping Study the Company will also investigate manganese sulphate solution purification and production options.

HPMSM Strategy Rationale

Whilst manganese is primarily used in the steelmaking industry, a significant growth market is emerging in the electric vehicle (EV) sector. In an increasing number of EV battery compositions, manganese is used in the cathode and makes up a significant proportion of the volume of the battery. The introduction of the manganese into LFP batteries, which is the fastest growing segment of the EV battery market, will likely see further demand for HPMSM.

Currently, China dominates the High Purity Manganese market, with over 90% of global production. Similar to other cathode precursor materials the requirement for security and diversification of supply will become a significant factor inducing the establishment of additional supply outside of China for the American and European car manufacturing industries.

In addition HPMSM pricing is significantly higher than producing a manganese oxide concentrate product with prices up to US$1,500 (AU$2360) per tonne FOB considered to be achievable.

The Company believes that the pursuit of HPMSM production has the potential to materially improve the already positive economics of our project portfolio and be a key contributor to emissions reduction through the transition to EVs.

This announcement has been approved by the Board of Black Canyon Limited.

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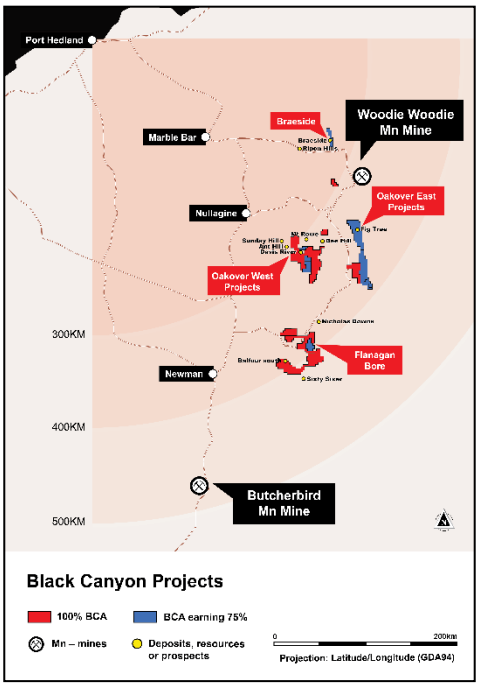
About Black Canyon

Black Canyon has entered into a farm-in and joint venture with ASX listed Carawine Resources Limited (ASX:CWX) to acquire a majority interest in the Carawine JV Project in Western Australia. The Carawine Project covers approximately 800 km^2 of tenure located south of the operating Woodie-Woodie manganese mine, providing a large footprint in a proven and producing manganese belt. Black Canyon has also applied for had granted other exploration licenses adjacent to the Carawine Project that increases the total land holdings to over 2400 km^2. In addition to manganese, the Carawine Project also hosts multiple copper occurrences including the Western Star prospect which comprises a large zone of surface copper enrichment.



Manganese and copper continue to have attractive fundamentals with growing utilisation in the battery mineral sector and challenging supply conditions.

Compliance Statements

Reporting of Exploration Results and Previously Reported Information

The information in this report that relates to Exploration Results is based on, and fairly represents, information and supporting documentation reviewed by Mr Brendan Cummins, Executive Director of Black Canyon Limited. Mr Cummins is a member of the Australian Institute of Geoscientists, and he has sufficient experience which is relevant to the style of mineralisation and type of deposits under consideration and to the activity which has been 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 Cummins consents to the inclusion in this release of the matters based on the information in the form and context in which they appear. Mr Cummins is a shareholder of Black Canyon Limited.

The information in this report that relates to metallurgical testwork results is based on information reviewed by Mr David Pass, who is a Member of the Australasian Institute of Mining and Metallurgy. Mr Pass is an employee of BatteryLimits and consultant to Black Canyon Limited. Mr Pass has sufficient experience relevant to the mineralogy and type of deposit under consideration and the typical beneficiation thereof 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 Pass consents to the inclusion in the report of the matters based on the reviewed information in the form and context in which it appears

For further information, please refer to ASX announcements dated 17 May 2021, 10 June 2021, 7 July 2021, 5 October 2021, 4 January 2022, 8 February 2022, 21 February 2022, 2 March 2022, 23 March 2022,13 April 2022, 9 June 2022 and 7 September 2022 which are available from the ASX Announcement web page on the Company's website. The Company confirms that there is no new information or data that materially affects the information presented in this release that relate to Exploration Results and Mineral Resources in the original market announcements

Appendix 1. Flanagan Bore diamond drill core collar information from the LR1 and FB3 deposits used in the leaching testwork

Hole ID	Deposit	East (GDA94)	North (GDA94)	RI	Survey Method	EOH (m)	Dip	Azimuth
DDLR101	LR1	274351	7456998	504	GPS	42.4	-90	360
DDFB301	FB3	278482.18	7458151.95	533.91	DGPS	54.6	-90	360

Appendix 2. JORC 2012 Table 1

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 problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.*	• The samples were collected using industry standard PQ diamond core drill methods . • Drilling was completed by Topdrive who completed the entire DD drill program – 13 PQ holes for 477m • There was limited water encountered during the drill program • The drilling and sample techniques are considered appropriate for the style of mineralisation • The target sample weight per metre was approximately 9kg
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).*	• The drill type is diamond core (DD) drilling using vertical holes • The drill diameter us 80mm using a PQ core drill bit
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.*	• Sample recovery was calculated measuring the core retrieved from each core run which was estimated by the driller and confirmed by the geologist on the rig and secondly by assessing the weight of the representative samples delivered to laboratory • The drill recoveries were deemed acceptable using triple tube • No significant sample bias due to sample loss is evident from the observed sample recoveries
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.*	• Drillhole logging was completed on site recording lithology, texture, grain size and colour. • The core was also photographed and used to further detailed logging post the drill program

Criteria	JORC Code explanation	Commentary
	• *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.* • *The total length and percentage of the relevant intersections logged.*	• The logging was considered appropriate for exploration • Every 1m interval was logged – 477m
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 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 diamond core was not cut for assay. The entire cored material was used for test work. • The diamond holes were however twinned with RC drill holes which has been previously been reported
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.*	• The diamond core was not cut for assay. The entire cored material was used for test work. • The diamond holes were however twinned with RC drill holes which has been previously been reported • Twinning holes is an acceptable proxy for assaying the diamond core
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.*	• The diamond core was not cut for assay. The entire cored material was used for test work. • The diamond holes were however twinned with RC drill holes which has been previously been reported
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.*	• Once a drill hole was completed the drill collar was located using a GARMIN handheld GPS with an accuracy of +/- 5m • At LR1 and FB3 a the drill collars were also picked with a DGPS • The grid system is UTM zone 51, GDA94 datum • The topography is quite flat reflecting the underlying stratigraphy. The holes are shallow and downhole deviation is not considered material in the context of these results
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.*	• The drill spacing for the DD core program is irregular but is considered representative of the geology and grade of a potential life of mine sample • The drill hole spacing is considered appropriate for this stage of advanced exploration with a high level of geological and mineralisation confidence

Criteria	JORC Code explanation	Commentary
	• *Whether sample compositing has been applied.*	
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 LR1 deposit is flat and gently plunging. Drill logs and assay data have identified cross cutting dolerite dykes that may have intruded into zones of structural weakness which does appear at this early stage to terminate the prospective horizon to the south • The FB3 deposit is gently folded and plunging shallowly to the south west. It is generally flat lying and openly folded. • The drill hole orientation otherwise is suitable for this style of mineralisation and considered appropriate and unlikely to introduce sample bias
Sample security	• *The measures taken to ensure sample security.*	• The drill core samples were stored on site and then transported to the laboratory for further processing. • The core trays were inspected and audited by the laboratory who did not report any suspicious or tampered samples
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• Other than internal review by Company staff no audits have been completed. • The CP was on site for parts of the DD drill program and considers drilling and sampling techniques to be equal to industry standard and appropriate for the style of mineralisation and the results being reported.

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 drilling was undertaken on granted tenement E46/1301 • Black Canyon has a farm-in and joint venture agreement with Carawine Resources Ltd (ASX:CWX), Black Canyon has earnt an initial 51% interest and is now earning up to 75% in the Carawine Projects that includes E46/1301 • The tenement has a native title Heritage Protection Agreement with the Karlka Nyiyaparli People that required a Heritage Survey to be undertaken prior to ground disturbing activities. To this end an Ethnographic and Archeologic survey was completed prior to commencement of site activities • There are no other known impediments to exploring E46/1301
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• Previous work on the tenure Includes exploration by Sentinel Mining Company carried out in 1968 in the general area of Balfour Downs. The exploration work included rock chip sampling from the southern edge of E46/784 which returned three samples with manganese values of 21.6 %, 25.7% and 11.4% Mn within manganese surface enrichment of Balfour Shales. • Consolidated Global investment Pty Limited ('CGI') owned tenement E46/784 between 2010 and 2015 and carried out exploration work. • Early reconnaissance work completed by CGI delineated many occurrences of manganese enriched outcroppings of the Balfour Formation. These north south striking outcrops were continuous over a distance of 1 km with widths of 50 m to 90 m in the LR1 Prospect area. Further exploration work completed by CGI included identification of prospective area using google images and remote sensing, a heritage survey and clearance for drilling using local Martu consultants. CGI completed a reverse circulation drilling programme of 22 holes in July 2012 on E46/784.
Geology	• *Deposit type, geological setting and style of mineralisation.*	• The Flanagan Bore tenement is located within the Oakover Basin, the edges of which are defined by the Neoarchaean Fortescue Group. Most of the tenement is covered by quaternary alluvium, sheetwash and outcrop only exists within the southern part and consists of rocks of the Manganese Group, mainly the Encheddong Dolomite and Balfour Formation. The tenement contains widespread manganese scree associated with manganese enriched Balfour Formation shales • The prospects can be separated into three primary units, the upper unmineralised Balfour shale, the mineralised Balfour shale and the lower basal shale unit. The upper unmineralised shale is brown grey in

Criteria	JORC Code explanation	Commentary
		colour and occurs from surface up to 10 m in depth intermittently across the project area. • The manganiferous shale unit contains a supergene enriched manganiferous horizon which exhibits thickness range between 15 m to 37 m depth gently dipping to the south, progressively thickening to the east-south-east. The manganese layers are confined to distinct banding within the Balfour and there are also minor occurrences of interbedded red/brown shales intermixed within saprolitic clay bands.
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* ○ *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.*	• Refer to Appendix 1 for a listing of the DD drill holes used for the leaching testwork.
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.*	• No exploration results are reported
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 (eg 'down hole length, true width not known').*	• The deposit is mostly flat lying exhibiting a gentle dip of mineralisation to the south, south-west therefore 90 degree angled (vertical) drill holes considered appropriate. • The mineralisation of the LR1 prospect is primarily strata bound striking approximately 80 to 90 degrees, gently dipping to the south • The core drill holes are interpreted to represent close to true widths of the mineralisation
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 maps or sections are relevant to the reporting of the leaching results
Balanced reporting	• *Where comprehensive reporting of all Exploration Results is not practicable,*	• Information considered material to the reader's understanding of the leaching

Criteria	JORC Code explanation	Commentary
	representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.	has been reported in the body of the text
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.*	• All information considered material to the reader's understanding and context of the leaching have been reported.
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 work is planned that includes: detailed metallurgical test work on additional diamond drill core, environmental and hydrogeological investigations • The Company is intending to update the Mineral Resource Estimates over the LR1 and FB3 deposits