# **COMPETENT PERSON'S REPORT**



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Mr. Yuway Szetoo Director, Domestic Finance Tianqi Lithium Corporation 2052, HKRI Center Tower 1 288 Shimen 1st Road, Jing'an District Shanghai 200041 China The Directors Tianqi Lithium Corporation No.10 East Gaopeng Road, Hi-Tech Zone, Chengdu, China

Dear Sir

#### **COMPETENT PERSONS REPORT**

#### **GREENBUSHES LITHIUM MINE—WESTERN AUSTRALIA, AUSTRALIA**

## AND CUOLA LITHIUM PROJECT—SICHUAN, PEOPLE'S REPUBLIC OF CHINA

#### **BEHRE DOLBEAR AUSTRALIA PTY LIMITED**

Behre Dolbear Australia Pty Limited ("BDA"), a partially-owned subsidiary of Behre Dolbear Group Inc., is pleased to submit a Competent Person's Report ("CPR") for the Greenbushes Lithium Mine ("Greenbushes Mine"), Western Australia ("WA"), Australia and the Cuola Lithium (or Spodumene) Project ("Cuola Project"), Sichuan Province, the People's Republic of China ("China"). BDA's principal office is in North Sydney, New South Wales, Australia; BDA's address is noted at the top of the letter head. This letter of transmittal forms part of the CPR.

The Greenbushes Mine is owned and operated by Talison Lithium Limited ("Talison"), which is 51% owned and controlled by an incorporated lithium joint venture ("Joint Venture") between Tianqi Lithium Corporation ("Tianqi") (51%) and IGO limited ("IGO") (49%), with the remaining 49% interest owned by Albemarle Corp Inc ("Albemarle").

The operation consists of an open pit mining and processing operation, which includes two crushing plants, three processing plants and associated administrative facilities, workshop, laboratory and other infrastructure, all located adjacent to the open pit mining operation. The Greenbushes Central Lode and Kapanga lithium deposits contained a Mineral Resource of 341.9 million tons ("Mt") at 1.6% lithium oxide ("Li<sub>2</sub>O") and an Ore Reserve of 169.6Mt grading 2.0% Li<sub>2</sub>O (as at August 31, 2021, including stockpiled material). In the period from September 1, 2021 to December 31, 2021 Talison processed 1.4Mt of ore at 2.4% Li<sub>2</sub>O. Taking the August 31, 2021 Mineral Resource and Ore Reserve and deducting the ore quantities processed since the beginning of September 2021 the depleted Mineral

Resource totals 340.5Mt at 1.6% Li<sub>2</sub>O, and the remaining Ore Reserve is 168.1Mt at 2.0% Li<sub>2</sub>O. The three process plants, the Technical Grade Plant ("TGP"), the Chemical Grade Plant No 1 ("CGP1") and the Chemical Grade Plant No 2 ("CGP2") produce mineral concentrates containing a range of lithium grades with varying iron impurity levels. Low iron technical grade ("TG") concentrates are produced in the TGP; chemical grade ("CG") concentrates which contain higher levels of iron are produced in CGP1 and CGP2. The main use for low iron concentrates is as feedstock for the glass and ceramic industries. The CG concentrates are supplied to the Joint Venture and Albemarle for processing into lithium chemicals. The essential difference between the TG and CG ores is the lower iron content of the spodumene in the TG ore.

Talison has completed commissioning of CGP2 and its associated crusher, CR2, and these plants are in the ramp up stage; total spodumene concentrate production capacity (TGP, CGP1 and CGP2) is expected to be approximately 1.4 million tons per annum ("Mtpa") on completion of the CGP2 ramp up and yield improvements.

Talison has also estimated a Mineral Resource and Ore Reserve for the old tailings storage facility ("TSF1") based on the construction of a 2Mtpa tailings retreatment plant ("TRP"). A Mineral Resource of 18.3Mt at 1.3% Li<sub>2</sub>O and an Ore Reserve of 10.1Mt at 1.4% Li<sub>2</sub>O have been defined.

Talison completed construction of the TRP in early 2022 which will employ the conventional flotation technology used in the existing plants to prepare a 6% spodumene concentrate ("SC6"); commissioning now underway. A mining contractor has been appointed and is due to mobilize to site in January 2022. When in full operation, this plant will add a further 280,000 tons per annum ("tpa") of spodumene concentrate.

The Cuola Project is 100% owned and operated by Sichuan Tianqi Shenghe Lithium Company Limited ("Tianqi Shenghe"), a wholly-owned subsidiary of Tianqi, and is in the planning and development stage. There has been no material development since BDA's last visit to the property in April 2018, and the discussion of the Cuola Project in this report is mostly based on a 2018 BDA report. An extensive exploration program from 2009 to 2011 defined the lithium resources at the property; a feasibility study and an initial engineering design report were completed in 2012, followed by the start of the project construction for a Phase I 600 thousand tons per annum ("ktpa") mining operation. However, construction was suspended by the Department of Land and Resources of Ganzi Prefecture in October 2013 due to an alleged environmental incident related to the neighboring Jiajika Lithium Mine owned and operated by a third party (refer to Section 5.8 of this report). Although regulatory approval to recommence construction/production was granted for the Cuola Project and the Jiajika Lithium Mine in 2019, Tianqi Shenghe has not yet resumed construction of the Cuola Project as Tianqi is currently sourcing all the spodumene concentrates for its processing plants from Talison's Greenbushes Mine in Western Australia and the concentrate production from the Greenbushes Mine can satisfy all of Tiangi's needs at this stage. Tiangi Shenghe is currently in discussion internally when and how it should resume the project construction.

The purpose of this CPR is to provide an independent technical assessment of Tianqi's Greenbushes Mine and Cuola Project, to be included in the prospectus for the Company's initial public offering ("IPO") on the main board of the Stock Exchange of Hong Kong Limited ("SEHK"). This CPR has been prepared in accordance with the Rules Governing the Listing of Securities on the SEHK ("Listing Rules"). The reporting standards adopted by this CPR are the Australasian Code for Reporting Exploration Results, Mineral Resources and Ore Reserves prepared by the Joint Ore

Reserves Committee of the Australasian Institute of Mining and Metallurgy, the Australian Institute of Geoscientists, and the Minerals Council of Australia in 1999 and revised in 2012 (the "JORC Code") and the VALMIN Code and Guidelines for Technical Assessment and Valuation of Mineral Assets and Mineral Securities for Independent Expert Reports, as adopted by the Australasian Institute of Mining and Metallurgy in 1995 and updated in 2015 (the "VALMIN Code").

The evidence upon which the estimated lithium Mineral Resources and Ore Reserves of the Greenbushes Mine and Cuola Project are based includes the deposit geology, drilling and sampling information, and project economics. BDA formed its view of the lithium Mineral Resource and lithium Ore Reserves estimates based on the site visits of BDA's professionals to the subject mining properties, interviews with Tianqi's and Talison's management team and site personnel, and assessment of the procedures and parameters used for the resource and reserve estimates by external consultants and by Tianqi's and Talison's internal team.

This BDA review was prepared through Behre Dolbear's Sydney office in Australia and the project team consisted of senior mining professionals from Sydney, Perth and the USA. The scope of work for the Greenbushes Mine review included technical analysis of the project geology, lithium Mineral Resource and lithium Ore Reserve estimates, review of mining, processing, operating costs, capital costs, environmental and social management, and occupational health and safety issues. The most recent BDA Competent Person site visit to Greenbushes Mine was by Mr Dan Greig on November 15, 2021. Numerous previous site visits have been conducted by BDA representatives from a variety of specialities including geology, mining, processing, infrastructure, permitting and cost analysis on an annual basis since 2012. The scope of work for the Cuola Project review included technical analysis of the project geology and lithium Mineral Resource estimates. In April 2018, BDA Competent Person, Dr. Qingping Deng, conducted a visit to the Cuola Project.

BDA's CPR comprises an introduction, followed by reviews of the technical aspects of geology, Mineral Resources and Ore Reserves, mining, processing, operating and capital costs, environmental and social management, occupational health and safety, an economic analysis and a risk analysis of the Greenbushes Mine and a review of the geology and Mineral Resources of the Cuola Project. BDA considers that the CPR adequately and appropriately describes the technical aspects of the mining properties and addresses issues of significance and risk. BDA notes that Talison has used outside consultants to prepare a JORC compliant Mineral Resource, including Table 1, for the Greenbushes Project, and BDA's comments and conclusions in that regard are based on the documentation reviewed and the Competent Persons' site visits.

BDA is independent of Tianqi, Talison, and any other associated parties. Neither BDA nor any of its employees or associates involved in this project hold any shares or have any direct or indirect pecuniary or contingent interests of any kind in Tianqi, Talison, the Greenbushes Mine or the Cuola Project. BDA is to receive a fee for its services (the work product of which includes this CPR) at its normal commercial rate and customary payment schedules. The payment of BDA's professional fee is not contingent on the outcome of this CPR.

The effective date of this CPR is January 1, 2022 and Tianqi has advised BDA that except for on-going lithium concentrate production, there have been no material changes for the Greenbushes Lithium Mine and the Cuola Project since the effective date. The sole purpose of this CPR is for the use of the Directors of Tianqi and their advisors in connection with the Company's IPO prospectus; it should not be used or relied upon for any other purpose. Neither the whole nor any part of this CPR,

nor any reference thereto may be included in or with or attached to any document or used for any other purpose, without BDA's written consent to the form and context in which it appears. BDA consents to the inclusion of this CPR in the Tianqi IPO prospectus for the purpose of the IPO on the SEHK.

Mr Dan Greig and Mr Peter Ingham are the Competent Persons for this CPR for the Greenbushes Mine and Dr. Qingping Deng is the Competent Person for this CPR for the Cuola Project. They all meet the SEHK Listing Rule requirements for Competent Persons of (i) having a minimum of five years of experience relevant to the style of mineralisation and type of deposit under consideration, to the type of resource and reserve estimation, and to the activities which Tianqi and Talison are undertaking, (ii) being professionally qualified and being members in good standing of a relevant Recognized Professional Organization; and (iii) taking overall responsibility for the CPR.

Mr Peter Ingham, Mr Malcolm Hancock and Mr John McIntyre are the Competent Evaluators for the Technical and Market Values presented in the CPR. They meet the SEHK Listing Rule requirements for Competent Evaluators of (i) having at least ten years relevant and recent general mining experience, (ii) having at least five years relevant and recent experience in the assessment and/ or valuation of Mineral Assets and (iii) holding all necessary licenses.

Mr Ingham, Mr Hancock and Mr McIntyre are Members and Certified Mineral Valuers ("CMV") of the Australasian Institute of Minerals Valuers and Appraisers ("AIMVA"). These are professional qualifications designed to indicate to regulators and kindred professional bodies that the individual has demonstrated to a panel of peers that he/she has more than 10 years of experience in his/ her nominated area of expertise and has been assessed as a recognized expert, competent to sign off on public and corporate documentation in assessing and appraising minerals projects. These qualifications are consistent with requirements under Listing Rules for the Australian, Canadian (Toronto), Hong Kong and Singapore Securities Exchanges and are intended to establish minimum qualification standards for public domain reporting.

Yours faithfully,

# **BEHRE DOLBEAR AUSTRALIA PTY LTD**

**Dan Greig** 

**BDA Senior Associate and Competent Person** 

**Peter Ingham** 

**BDA General Manager Mining, Project Manager and Competent Person** 

Qingping Deng, Ph.D., CPG BDA Director and Competent Person

Malcolm Hancock BDA Executive Director and Competent Person

John McIntyre

**BDA Managing Director and Competent Person** 

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# **1.0 INTRODUCTION**

Tianqi Lithium Corporation ("Tianqi") has a 51% controlling interest in an incorporated lithium joint venture ("Joint Venture") with IGO Limited ("IGO") that has a 51% controlling interest in Talison Lithium Limited ("Talison"), which owns and operates the Greenbushes Lithium Mine ("Greenbushes Mine"), located in the south-western corner of Western Australia ("WA"), Australia, and 100% interest in Sichuan Tianqi Shenghe Lithium Company Limited ("Tianqi Shenghe"), which owns the Cuola Lithium (or Spodumene) Project ("Cuola Project") in Yajiang County, Sichuan Province, in the People's Republic of China ("PRC" or "China") (Figure 1). Tianqi has requested that Behre Dolbear Australia Pty Limited ("BDA") undertake an independent technical review and prepare a Competent Persons Report ("CPR") in compliance with the requirements of Chapter 18 of the Stock Exchange of Hong Kong ("SEHK") Listing Rules. The Listing Company is a company incorporated in the PRC and is the entity to be listed on the SEHK.

BDA is the Australian subsidiary of Behre Dolbear & Company Inc., an international minerals industry consulting group which has operated continuously worldwide since 1911, with offices or agencies in Denver, New York, Toronto, Hong Kong, London and Sydney. Behre Dolbear specializes in mineral evaluations, due diligence studies, independent expert reports, independent engineer certification, valuations, and technical audits of Mineral Resources, Ore Reserves, mining and processing operations and project feasibility studies.

### **Summary of Valuation**

BDA's review of the Greenbushes Mine in Western Australia and Cuola Project in Sichuan Province in China covers the geology, exploration, and Mineral Resource estimates and to the extent relevant, Ore Reserve estimates, mining, processing, infrastructure, environmental and social aspects of the projects, project approvals, life of mine production plans, project implementation, capital and operating costs and project risks.

BDA has carried out a technical review of the projects and prepared this CPR, consistent with the requirements of the Rules Governing the Listing of Securities on the SEHK ("the Listing Rules"), specifically Chapter 18 and Rule 18.09. The review has been undertaken in accordance with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves—Report of the Joint Committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia, December 2012 ("the JORC Code") and the Code for the Technical Assessment and Valuation of Mineral and Petroleum Assets and Securities for Independent Expert Reports ("the VALMIN Code") as issued in 1995 and updated in 2012. BDA confirms that the requirements of Chapter 18 pertaining to project details that can be stated by an independent expert are detailed in this report. Mr Peter Ingham, Mr Malcolm Hancock and Mr John McIntyre are the Competent Evaluators for the Technical and Market Values presented in the CPR. They meet the SEHK Listing Rule requirements for Competent Evaluators of (i) having at least ten years relevant and recent general mining experience, (ii) having at least five years relevant and recent experience in the assessment and/or valuation of Mineral Assets and (iii) holding all necessary licenses.

BDA has reviewed the project Mineral Resources and Ore Reserves in accordance with Australian industry standards and for compliance with the JORC Code.

# **COMPETENT PERSON'S REPORT**

Tianqi proposes to prepare a prospectus to be issued in support of an initial public offering ("IPO") for a listing on the main board of The Stock Exchange of Hong Kong Limited (SEHK).

As part of the review of the Tianqi, BDA has prepared a valuation of the Greenbushes operation and assets in which Tianqi has an interest, including the hard-rock mining and processing operation and the TSF1 tailings treatment project which are owned 100% by Talison, as shown in summary in Table 1.1. Tianqi has a 26% interest in Talison. These valuations are considered Market Value for the Greenbushes Operations based on the definitions of the VALMIN Code. No value was assigned to Cuola project as it has no Ore Reserves.

#### Table 1.1

#### Valuation of Greenbushes Operation

Project	Low Valuation US\$B	Most Likely US\$B	High Valuation US\$B
Talison Mining and Processing Assets (100%)	5.6	6.8	8.2
Talison Mining and Processing Assets (26% Tianqi Share)	1.5	1.8	2.1
Total Tianqi Share Mining & Processing Assets	1.5	1.8	2.1

The metric system is used throughout this report. The currency used in the Greenbushes Mine review is Australian dollar ("A\$") with an exchange rate conversion from Australian dollars to US dollar of 0.75.

#### **Greenbushes Mine**

According to industry commodities research expert Wood Mackenzie (Asia Pacific) Pty Ltd ("Wood Mackenzie"), Greenbushes Mine is the world's largest lithium mine, supplying around 38% of all hard rock lithium globally in 2021 and 22% of all lithium production globally. The workforce at the Greenbushes Mine currently comprises around 660 employees and permanent contractors and an additional 270 persons involved in construction projects and maintenance shutdowns. Talison is owned by the Joint Venture company (51%) and Albemarle Corp Inc (49%) ("Albemarle"); the Joint Venture is owned by Tianqi (51%) and IGO (49%).

Talison produces lithium mineral concentrates from its operations at Greenbushes located 90 kilometers ("km") southeast of the port of Bunbury, a major bulk-handling port in the southwest of WA (Figure 2). The lithium mining operation is close to the Greenbushes town site, located in the Shire of Bridgetown-Greenbushes (population 4,700). Greenbushes has a population of approximately 370 people and is serviced by the larger town of Bridgetown. It is connected to the regional center of Bunbury and the capital of WA, Perth, by the South Western Highway.

The Greenbushes Central Lode and Kapanga lithium deposits contained a Mineral Resource of 341.9 million tons ("Mt") at 1.6% lithium oxide ("Li<sub>2</sub>O") and an Ore Reserve of 169.6Mt grading 2.0% Li<sub>2</sub>O as at August 31, 2021, with a mine life of approximately 21 years at a projected plant throughput rate of 4.3 million tons per annum ("Mtpa") increasing to 9.5Mtpa over the project life with the construction of two further Chemical Grade ("CG") plants giving four CG plants in total (CGP1, 2, 3, and 4) and the Technical Grade Plant ("TGP"). All production to meet current demand is sourced from the Central Lode open pit mining operations. The processing operations include two crushing plants, three processing plants and associated administrative facilities, workshop, laboratory and other

infrastructure, all located adjacent to the open pit mining operation. The three existing plants, the TGP and the two CG plants (CGP1 and CGP2) produce mineral concentrates containing a range of lithium grades with varying iron impurity levels. Low iron technical grade ("TG") concentrates are produced in the TGP but CG ore can also be fed to the TGP; chemical grade (CG) concentrates which contain higher levels of iron are produced in CGP1 and CGP2. The main use for low iron concentrates is as feedstock for the glass and ceramic industries. The CG concentrates are supplied to Tianqi and Albemarle for processing into lithium chemicals. The essential difference between the two ores is the lower iron content of the spodumene in the TG ore.

In the period from September 1 to December 31, 2021 Talison processed 1.4Mt of ore at 2.4%  $Li_2O$ . Taking the August 31, 2021 Mineral Resource and Ore Reserve and deducting the ore quantities subsequently processed, the depleted Mineral Resource totals 340.5Mt at 1.6%  $Li_2O$  and the Ore Reserve contains 168.1Mt at 2.0%  $Li_2O$  at December 31, 2021.

The lithium processing operations have been progressively upgraded to the current ore treatment capacity of 4.3Mtpa. Lithium concentrate production is dependent on ore grade, lithium recovery, overall lithium concentrate grade and the amenability of the ore to processing. As at the end of December 2021 TGP and CGP1 plants are operating at 100% of capacity while CGP2 is ramping up to full production. Construction of the Tailings Retreatment Plant ("TRP") was completed in the first quarter of 2022, with commissioning underway; the plant will treat 2Mtpa of reclaimed tailings. Talison has announced Board approval for further expansion through the construction of CGP3, taking annual lithium concentrate production capacity to 2.1Mtpa post commissioning, currently planned to be operating in 2025. A further processing plant CGP4 is also planned with construction beginning in 2025. Talison received Ministerial Approval for the Lithium Mine Expansion (CGP3 and CGP4) by way of published Ministerial Statement No. 1111 on August 19, 2019.

In addition to the Central Lode and Kapanga Ore Reserves Talison has undertaken drilling, resource modeling and planning for the extraction of material contained within the original tailings storage facility ("TSF1"), which pre-dates lithium extraction at Greenbushes. This tailings facility contains the waste product from the older tantalum primary treatment plant that had no lithium recovery circuit and which contains significant lithium grades. A Probable Ore Reserve of 10.1Mt at 1.4% Li<sub>2</sub>O has been estimated from the upper part of TSF1, and a feasibility study has been undertaken based on a new stand-alone process plant with a treatment rate of 2Mtpa, planned with a five year mine life. Mining is scheduled to start in January 2022, while construction of the tailings treatment process plant is nearing completion, with plant hand-over due in January 2022, to be followed by a four month commissioning period.

BDA has previously undertaken several reviews of Talison's Greenbushes Mine dating as far back as 2009; these reviews were undertaken in an independent capacity and BDA confirms that it is independent of all parties in the transaction. A site visit was conducted in March 2018 by Messrs Dan Greig and Peter Ingham, Competent Persons for the Greenbushes Mine; that visit included a review of the then current in-house Talison JORC Mineral Resource and Ore Reserve estimates (including Table 1), as well as inspection of the open pit operations, processing and related aspects of the operation and detailed discussions with the Talison staff on the preparation of the Mineral Resource and Ore Reserve estimates. Messrs Greig and Ingham again visited the site in January 2020 on an independent technical review assignment. A further visit was paid by Mr Greig in November 2021 to inspect open pit operations, recent plant and infrastructure construction activities and other operational aspects.

# **COMPETENT PERSON'S REPORT**





Figure 1	PROJECTS LOCATION PLAN	
BDA - 201 (03) November 2021	Behre Dolbear Australia Pty Ltd	

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Greenbushes Lithium Operations

Figure 2 804-201 (03) November 2021 LOCATION PLAN

#### **Cuola Project**

The Cuola Project is located in Yajiang County, Sichuan Province, in China, approximately 500km west of the city of Chengdu, the capital of the Sichuan Province (Figures 1 and 3). The project is located at the southeastern edge of the Qinghai-Tibet plateau at an altitude ranging from 4,100m to 4,900m. The Cuola Project site is approximately 38km northeast of the Yajiang County seat. A 4km long dirt-and-gravel road links the Cuola Project site to the Jiajika Lithium (or Spodumene) Mine ("Jiajika Mine") owned and operated by a third party in the east and within the administration area of Kangding City, with a further 33km dirt-and-gravel road east connecting to the town of Tagong in Kangding City. Tagong is located on provisional highway S215, which connects to the G318 national highway in the south over a distance of 108km to Kangding and 477km to Chengdu.

No material development has been undertaken on the Cuola Project since the last BDA visit in April 2018. BDA has not made a further site visit on this occasion due to the travel restriction caused by the Covid 19 pandemic, but BDA has reviewed a drone video taken in October 2021 by Tianqi to confirm the status of the project. Discussion on the Cuola Project in this report is mostly based on the 2018 BDA review and report. Tianqi Shenghe currently holds a mining license covering an area of 2.069 square kilometers ("km2") over the Cuola Project. An extensive exploration program was carried out on the project from 2009 to 2011 by Tianqi Shenghe, which defined a lithium Mineral Resource hosted by a series of spodumene pegmatite veins totalling 14.2Mt of Indicated Resource with an average Li<sub>2</sub>O grade of 1.3% and 5.5Mt of Inferred Resource with an average Li<sub>2</sub>O grade of 1.3%. A feasibility study for a Phase I 600 thousand tons per annum ("ktpa") mining operation with traditional open-pit/underground mining and crushing-grinding-flotation-magnetic separation processing was completed in February 2012; an initial engineering design study was completed in July 2012, followed by the start of project construction. However, construction was suspended by the Department of Land and Resources of Ganzi Prefecture in October 2013 due to an alleged environmental incident related to the neighboring Jiajika Mine, which is not owned by Tianqi (refer to Section 5.8). Although regulatory approval to recommence construction and subsequent production was granted for the Cuola Project and the Jiajika Mine in 2019, Tianqi Shenghe has not yet resumed the development of Cuola Project. The Company is currently sourcing all the spodumene concentrate for its processing plants from Talison's Greenbushes Mine in Western Australia and the concentrate production from the Greenbushes Mine can satisfy all of Tianqi's needs at this stage. Tianqi Shenghe is currently considering when and how it should resume the development of the Cuola Project.

BDA conducted a site visit to the Cuola Project in Yajiang County and to Tianqi Shenghe's head office in Chengdu from April 14-21, 2018. Dr. Qingping Deng, Competent Person for the Cuola Project, reviewed the project geology and Mineral Resource estimation. A preliminary review of the feasibility study and the initial engineering design study was also carried out during the visit. It was found that both the project feasibility study and the initial engineering design study was also carried out during the visit. It was found that both the project feasibility study and the initial engineering design study used all the Indicated and Inferred resources for mine planning and that some of the economic parameters used for these studies were not up to date. BDA considers that JORC Code compliant Ore Reserves have not yet been defined for the Cuola Project, and this BDA report therefore only reviews the Mineral Resources for the Cuola Project. Ore Reserves, mine planning, mining and processing operations, capital and operating costs, and project economic analysis of the project are not discussed in this report as it is not considered that the relevant work has yet progressed to an appropriate standard. These aspects can be further reviewed by BDA in the future when a feasibility study or an initial engineering design study conforming with the JORC Code and based on current economic conditions is completed by Tianqi Shenghe.





Cuola Lithium Project

Figure 3 804-201 (03) November 2021 LOCATION PLAN Behre Dolbear Australia Pty Ltd

# 2.0 QUALIFICATIONS OF BEHRE DOLBEAR AUSTRALIA

BDA is the Australian subsidiary of Behre Dolbear & Company Inc., an international minerals industry consulting group which has operated continuously worldwide since 1911, with offices or agencies in Beijing, Chicago, Denver, New York, Toronto, Hong Kong, London and Sydney. Behre Dolbear specializes in mineral evaluations, due diligence studies, independent expert reports, independent engineer certification, valuations, and technical audits of resources, reserves, mining and processing operations and project feasibility studies.

BDA's project team for this independent technical review consisted of senior-level professionals from Behre Dolbear's Sydney office in Australia and BDA associates. BDA professionals contributing to the study and to this CPR include:

- Dr. Qingping Deng (BS, MS and PhD, CPG AIPG, MMSA), is a Director of BDA. Dr Deng is a geologist and a mining specialist with over 35 years of worldwide professional experience in the minerals industry, specializing in geology, exploration, deposit modeling and mine planning, estimation of resources and reserves, geostatistics, resource/reserve auditing, strategic planning, economic analysis, project evaluation and valuation, feasibility studies, competent person's reports for securities filing, and due diligence studies for financing and acquisition for various metals and industrial minerals, coal, dimension stones and fertilizers in North, Central and South Americas, Asia, Australia, Europe, and Africa. He is a Certified Professional Geologist with AIPG, which is a Recognized Professional Organization under the Australasian JORC Code. He meets all the requirements for 'Competent Person' as defined in the Australasian JORC Code and the SEHK Listing Rules for the purpose of Mineral Resource/Ore Reserve estimation and reporting. In recent years, Dr Deng has managed a number of CPRs to support successful IPOs or acquisitions for the SEHK and other securities exchanges. He was the formerly President and Chairman of Behre Dolbear Asia, Inc.. Dr Deng also managed Behre Dolbear's Ore Reserve and Mine Planning section for over 10 years and is a wellrecognized ore reserve specialist. Dr. Deng is fluent in both English and Chinese.
- **Mr Dan Greig** (BSc (Hons) Geology, MAIG) is a Senior Consultant for BDA and a graduate geologist with over 35 years of experience in the mineral industry in Africa, Australia, SE Asia, Europe, the USA and South America. His experience includes a broad range of activities, including generation and management of grass-roots exploration, detailed drilling programs, project evaluation and acquisition, resource estimation and feasibility studies and mine development. Specialities include QA/QC evaluation of resource databases for reporting under the JORC Code and Canadian Instrument NI 43-101. He has experience in a range of commodities including gold, copper, nickel, lithium, mineral sands and uranium.
- Mr Peter Ingham (BSc (Min), MSc, DIC, G.Dip. App.Fin. (Sec. Inst.), CEng, FAusIMM, MIMMM, MAIMVA (CPA)) is General Manager Mining of BDA and is a graduate mining engineer with more than 30 years in the mining industry in Europe, Africa, Australia and Asia. His experience includes operations management, mining contract management, strategic planning, project assessment and acquisition, cost estimation and operational audits and trouble-shooting. He is experienced in a range of commodities, including gold, copper, nickel, base metals, lithium and platinum, in both surface and underground mining.

- **Mr Roland Nice** (BSc, FAusIMM, Life MCIM, MAIME, MIEAust, Chartered Engineer) is a Senior Associate of BDA with more than 45 years as a professional metallurgist. He has extensive experience in process engineering and operations, project evaluation, technical design and analysis. He has held senior management positions, including General Manager, Metallurgy and Concentrator Manager. Mr Nice has been closely involved with the process plant design, development and construction of gold, copper, nickel, non-ferrous and base metal mines, industrial minerals, uranium and graphite projects. He has worked principally in Australia, Canada, Africa and Southeast Asia.
- Mr Richard Frew (BE Civil, MIE Aust) is a Senior Associate of BDA with more than 40 years' experience as a planning, estimation and contracts engineer. He is experienced in contract management, feasibility study review, financial modeling, capital cost estimation, infrastructure, project controls and implementation. He has worked on a large number of projects providing management and project services to the owners or financiers, including major projects in Australia, Indonesia, the Philippines, Argentina, Mauritania, New Zealand and Romania.
- Mr Adrian Brett (BSc (Hon) Geol., MSc, MEnvir.Law, FAusIMM, MAIMVA(CMV)) is a Senior Associate of BDA with more than 40 years' experience in environmental and geo-science, including the fields of environmental planning and impact assessment, site contamination assessments, environmental audit, environmental law and policy analysis and the development of environmental guidelines and training manuals. He has worked in an advisory capacity with several United Nations, Australian and overseas government agencies. He has completed assignments in Australia, Indonesia, Thailand, Laos, the Philippines, the Middle East, Africa and South America.
- Mr Malcolm Hancock (BA, MA, FGS, FAusIMM, MIMM, MMICA, CP(Geol), MAIMVA(CMV)) is a Principal and Executive Director of BDA. He is a geologist with more than 40 years of experience in the areas of resource/reserve estimation, reconciliation, exploration, project feasibility and development, mine geology and mining operations. Before joining BDA, he held executive positions responsible for geological and mining aspects of project acquisitions, feasibility studies, mine development and operations. He has been involved in the feasibility, construction, and commissioning of several mining operations. He has worked on both open pit and underground operations, on gold, base metal, light metal and industrial mineral projects, and has undertaken the management and direction of many of BDA's independent engineer operations in recent years.
- **Mr John McIntyre** (BE (Min) Hon., FAusIMM, MMICA, CP (Min), MAIMVA(CMV)) is a Principal and Managing Director of BDA. He is a mining engineer who has been involved in the Australian and international mining industry for more than 40 years, with operational and management experience in copper, lead, zinc, gold, uranium, industrial minerals and coal, in open pit and underground operations. He has been involved in numerous mining projects and operations, feasibility studies and technical and operational reviews in Australia, West Africa, New Zealand, North and South America, PNG and South East Asia. He has been a consultant for more than 20 years and has been Managing Director of BDA since 1994, involved in the development of the independent engineering and technical audit role. He is a Member of the VALMIN Committee.

BDA's project team has visited the two sites. Mr Dan Greig visited Greenbushes Mine in November 2021 while Mr Peter Ingham and Mr Greig visited the site in January 2020 and in March 2018. Mr Richard Frew and Mr Adrian Brett have also previously visited the site in April 2017 on an independent technical review assignment. Dr. Qingping Deng visited the Cuola Project and Tianqi Shenghe's office in Chengdu in April 2018.

# **3.0 DISCLAIMER**

This assessment has been based on data, reports and other information made available to BDA by Tianqi and Talison and referred to in this report. BDA has been advised that the information is complete as to material details and is not misleading. A draft copy of this report has been provided to Tianqi and Talison for comment as to any material errors of fact, omissions or incorrect assumptions.

BDA has reviewed the data, reports and information provided and has used consultants with appropriate experience and expertise relevant to the various technical aspects. The opinions stated herein are given in good faith. BDA believes that the basic assumptions are factual and correct and the interpretations reasonable.

BDA does not accept any liability other than its statutory liability to any individual, organization or company and takes no responsibility for any loss or damage arising from the use of this report, or information, data, or assumptions contained therein. With respect to the BDA report and use thereof, Tianqi agrees to indemnify and hold harmless BDA, its shareholders, directors, officers, and associates against any and all losses, claims, damages, liabilities or actions to which they or any of them may become subject under any securities act, statute or common law and will reimburse them on a current basis for any legal or other expenses incurred by them in connection with investigating any claims or defending any actions.

BDA has not undertaken an independent audit of the data or re-estimated the resources or reserves. BDA has not undertaken any legal due diligence on the status of the tenements but has viewed copies of the tenement documentation. Tianqi has advised that all tenements are in good standing. All mine operations, processing plants, mine infrastructure, waste dumps and tailings dams are sited within the granted mining lease for the Greenbushes Mine and all defined Mineral Resources are located within the granted mining license for the Cuola Project.

This report contains forecasts and projections based on data provided by Tianqi. BDA's assessment of the production schedule, the projected capital and operating costs and the estimate of remaining mine life are based on technical reviews of project data and discussions with technical personnel from Tianqi and Talison. BDA has reviewed the relevant data to assess the reasonableness of such projections. However, these forecasts and projections cannot be assured and factors both within and beyond the control of Tianqi and Talison could cause the actual results to be materially different from BDA's assessments and any projections contained in this report.

## 4.0 GREENBUSHES MINE

## 4.1 **Operations Overview**

# Location

Talison produces lithium mineral concentrates from its operations at Greenbushes, approximately 250km south of Perth, at latitude  $33^{\circ} 52'$  S and longitude  $116^{\circ} 04'$  E, 90km southeast of the port of Bunbury, a major bulk-handling port in the southwest of WA (Figure 2).

# **COMPETENT PERSON'S REPORT**

The lithium mining operation is in close proximity to the Greenbushes town site located in the Shire of Bridgetown-Greenbushes (population 4,700). Greenbushes has a population of approximately 370 people and is serviced by the larger town of Bridgetown.

About 55% of the tenements held by Talison are covered by State Forest which is under the authority of the Department of Biodiversity, Conservation and Attractions ("DBCA"). The majority of the remaining land is Private Land which covers about 40% of the surface rights. The remaining ground comprises Crown Land, Road Reserves and other miscellaneous reserves.

Access to the Greenbushes Mine is via the sealed South Western Highway between the regional center of Bunbury and Bridgetown to Greenbushes Township and via Maranup Ford Road to the Greenbushes Mine.

## **History and Ownership**

Mining in the Greenbushes area has continued almost uninterrupted since tin was first discovered in 1886. Greenbushes is recognized as the longest continuously operated mine in WA.

# Tin

Since cassiterite mineralisation was first discovered in 1886, tin has been mined almost continuously in the Greenbushes area, although in more recent times lower tin prices and the emergence of lithium and tantalum as major revenue earners have relegated tin to the position of a by-product. Tin was first mined at Greenbushes by the Bunbury Tin Mining Co in 1888. There was a gradual decline in tin production between 1914 and 1930. Vulcan Mines carried out sluicing operations of the weathered tin oxides between 1935 and 1943, whilst between 1945 and 1956, modern earth moving equipment was introduced and tin dredging commenced. Greenbushes Tin NL was formed in 1964 and open cut mining of the softer oxidized rock commenced in 1969.

## Tantalum

In the 1940s, tantalum mining at Greenbushes started concurrently with advancements in electronics.

Tantalum hard rock operations commenced in 1992 with an ore processing capacity of 800,000tpa. By the late 1990s demand for tantalum peaked, and the existing high grade Cornwall Pit was nearing completion (Figure 4). In order to meet increasing demand a decision was made to expand the mill capacity to 4Mtpa and develop an underground mine to provide higher grade ore for blending with the lower grade ore from the Central Lode pits (C3 and C1).

An underground operation was commenced at the base of the Cornwall Pit in April 2001 to access high-grade ore prior to the depletion of the available open pit high-grade resources. In 2002 the tantalum market collapsed due to a slow-down in the electronics industry and subsequently the underground operation was placed on care and maintenance. The underground operation was restarted in 2004 due to increased demand but again placed on care and maintenance the following year; it is now closed and flooded. The tantalum primary treatment plant that processed mined ore to produce tantalum and tin concentrates was put on care and maintenance in 2006 and is now being dismantled.

The open pit lithium operations have continued throughout recent times but in 2009 the mineral rights were separated, with Talison retaining the rights to lithium in the tenements whereas the tantalum and other mineral rights were retained by Global Advanced Metals Ltd ("GAM").

# **COMPETENT PERSON'S REPORT**

## Lithium Minerals

The mining of lithium minerals is a relatively recent event in the history of mining at Greenbushes with Greenbushes Limited commencing production of lithium minerals in 1983 and commissioning a 30,000tpa lithium mineral concentrator two years later in 1984/85. The lithium assets were acquired by Lithium Australia Ltd in 1987 and by Sons of Gwalia in 1989. Plant capacity was increased to 100,000tpa of lithium concentrate in the early 1990s and to 150,000tpa of lithium concentrate by 1997, which included the capacity to produce a spodumene concentrate for the lithium chemical processing market.

# **COMPETENT PERSON'S REPORT**



**Tianqi Lithium Corporation** 

Greenbushes Lithium Operations

Figure 4

SITE LAYOUT PLAN

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In 2007, Talison purchased the Greenbushes Mine from Sons of Gwalia Limited ("SOG") and in 2009 Talison and Global Advanced Metals Ltd (GAM) entered into a mineral rights agreement (Reserved Mineral Rights Agreement) to coordinate the exercise of the parties' respective mineral rights on the tenements. Under the agreement, GAM retained the exclusive right to conduct exploration and mining operations for all minerals other than lithium on the tenements. The tenements are held and controlled by Talison, and Talison has the rights to all lithium exploration and mining.

The Greenbushes pegmatite hosts the world's largest known reserve of lithium minerals as reported in 2021 (*source Wood Mackenzie*). While the overall lithium grade of the pegmatite (2%  $Li_2O$ ) is above the typical average of 1.0-1.3%  $Li_2O$  of other lithium-rich orebodies, the Greenbushes orebody also contains large zones of spodumene-rich ore where the average resource grade increases to over 3%  $Li_2O$ .

Currently, three lithium processing plants recover and upgrade spodumene using grinding, classification, gravity, flotation and magnetic processes, producing a range of lithium concentrates for bulk or bagged shipment. The three plants, the TGP, CGP1 and CGP2, produce mineral concentrates containing a range of lithium grades with varying iron impurity levels according to market requirements. Low iron technical grade concentrates are produced in the TGP; chemical grade concentrates which contain higher levels of iron are produced in CGP1 and 2. The main use for low iron TG concentrates is as feedstock for the glass and ceramic industries. The CG concentrates are supplied to the Tianqi/IGO Joint Venture (51%) and Albemarle (49%) for processing into lithium chemicals.

The lithium processing operations have been progressively upgraded to the current ore treatment capacity of 4.3Mtpa of ore feed from the three plants, the TGP, CGP1 and CGP2 at full capacity; lithium concentrate production is dependent on ore grade, lithium recovery and overall lithium concentrate grade. CGP1 previously operated at around 60% capacity based on market demand, but production was increased to full capacity in 2016 as demand improved; CGP2 is now ramping up to full design capacity. The TGP plant also currently operates at 100% of capacity. The tailings retreatment plant (TRP) has commenced commissioning and will treat 2Mtpa of reclaimed tailings. Talison has announced Board approval for further expansion through the construction of CGP3, taking annual lithium concentrate production capacity to 2.1Mtpa post commissioning, currently planned for 2025, although timing, which is based on market demand, is under review.

# **COMPETENT PERSON'S REPORT**

Lithium concentrate production has been carried out on the Greenbushes site for over thirty years. A summary of ore processing and concentrate produced by the plants over the period from 2015 to 2021, is shown in Table 4.1.

### Table 4.1

Year	Lithium Ore Processed kt	Lithium Concentrates Produced kt	Total Lithium Production (kt LCE)
2015	1,001	438	63
2016	949	494	71
2017	1,629	646	98
2018	2,181	724	111
2019	2,408	765	115
2020	1,914	580	88
2021	3.573	954	144

#### **Recent Lithium Production History**

Note: kt = thousand tons; "LCE" = lithium carbonate equivalent; Talison only produces a lithium spodumene concentrate but its contained lithium in concentrate is quoted on an industry standard 'lithium carbonate equivalent' basis; the derivation of lithium carbonate equivalent is tons x (% Li<sub>2</sub>O/100) x 2.473 = tons LCE

#### **Project Status**

The Greenbushes Mine has a history of production of lithium concentrates from Central Lode extending over more than thirty years. Talison's projections of future production levels are based on progressive increases in demand for lithium concentrates and the progressive expansion of site concentrate capacity. These increases are justified by market research which predicts continued growth in consumption of lithium, driven primarily by the lithium secondary (rechargeable) battery market which includes batteries for consumer applications and the developing markets for electric and hybrid vehicles, electricity grid storage and renewable energy storage.

The Measured and Indicated Mineral Resources at Central Lode have progressively increased over time with additional drilling and as a consequence of changing commodity prices, exchange rates and economics. Despite on-going mining, total Mineral Resources increased from 22Mt at a grade of 3.7% Li<sub>2</sub>O in 2010 to 342Mt at 1.6% Li<sub>2</sub>O at the end of August 2021 with extensions to the Central Lode and discovery of a new resource at Kapanga. An additional Indicated resource of 18Mt at 1.3% Li<sub>2</sub>O has been reported by Talison in the upper part of TSF1. Talison is continuing to undertake drilling and other exploration activities to determine the potential for additional resources in the Greenbushes landholding.

Ore Reserves for Central Lode and Kapanga at August 31, 2021 were 169.6Mt at 2.0%  $Li_2O$ , with a further Ore Reserve of 10.1Mt at 1.4%  $Li_2O$  contained within TSF1. In the period from September 1, 2021 to December 31, 2021 Talison processed 1.4Mt of ore at 2.4%  $Li_2O$ . Taking the August 31, 2021 Ore Reserve and deducting the ore quantities subsequently processed the depleted Ore Reserves for Central Lode and Kapanga were 168.1Mt at 2.0%  $Li_2O$  at December 31, 2021.

Talison plans to increase production in line with an anticipated increase in demand, through a series of simple, modular, low cost expansions, based on existing proven technology. The currently planned expansion of capacity is intended to reach design levels of production over the next six years to match forecast demand growth, while there is further scope to increase production through technological improvements.

#### Worldwide Lithium Production and Markets

BDA is not a marketing expert and has used detailed lithium market reports provided by Wood Mackenzie (Asia Pacific) Pty Ltd (Wood Mackenzie), a reputable international marketing research company for the market analysis. Global production of lithium is highly concentrated by geography, corporate ownership and source of lithium (salars or hard-rock mineral deposits). Wood Mackenzie estimated the total global lithium production in 2021 to be approximately 575,700 LCE with 337,500 LCE from hard rock minerals and 238,200t LCE from brine production. Wood Mackenzie reports that in 2021, Talison was the world's largest producer of lithium, with approximately 22% market share and the highest producer of hard rock minerals, with 38% of hard rock production; Sociedad Quimica y Minera de Chile SA ("SQM") was the world's second largest producer, with approximately 18% market share and the highest producer of lithium brine production, with 42% of brine production (see Figure 5).

The major global producers of lithium from hard rock mineral deposits are:

- Talison—Greenbushes Mine, WA, Australia
- Reed Industrial Minerals—Mt Marion, WA, Australia
- Pilbara Minerals Ltd ("PLS")—Pilgan, WA, Australia
- Allkem Limited—Mt Cattlin, WA, Australia
- Yichun TaNb—414 Mine, China

Lithium minerals are converted into lithium chemicals, predominantly in China. The majority of these chemicals are consumed domestically in China; however, lithium carbonate, lithium hydroxide and high purity lithium chemicals are also exported by the Chinese chemical converters. In recent years lithium carbonate and lithium hydroxide plants have been constructed in other centers, including Australia and more plants, particularly producing lithium hydroxide, are planned.

The major global producers of lithium from salars or brine deposits are:

- SQM—Salar de Atacama region in Chile
- Albermarle Corporation—Salar de Atacama region in Chile adjacent to SQM's Salar de Atacama facility, and the Silver Peak plant in Nevada, United States of America
- Livent—Salar del Hombre Muerto, in northwestern Argentina
- Lanke Lithium Qarhan Salt Lake, Qinghai, China
- Allkem—Salar de Olaroz, Jujuy Province in northwestern Argentina

Most of the lithium production from brines is used in the chemicals market, with a small amount used in the glass and ceramics technical markets. However, the lower price per unit of hard rock lithium minerals compared to lithium chemicals from brines as well as the inherent benefits of the alumina and silica content makes hard rock minerals the preferred feedstock in the glass and ceramics market.



#### 4.2 Geology and Mineralisation

# **Regional Geology**

The Greenbushes area is underlain by rocks of the Balingup Metamorphic Belt ("BMB"), which forms part of the Western Gneiss Province within the Archaean Yilgarn Craton in WA (Figure 6).

The Greenbushes pegmatites are intruded into a 15-20km wide, north to north-west trending lineament known as the Donnybrook-Bridgetown Shear Zone (Figure 6 inset), characterized by sheared gneiss, orthogneiss, amphibolite and migmatite. The pegmatites have been dated at approximately 2,525 million years ("Ma"), and appear to have been intruded during shearing, which would account for the fine grain size and internal deformation of the pegmatites. The pegmatites have been further affected by subsequent deformation and/or hydrothermal re-crystallization, the last episode being dated at around 1,100Ma.

# Local Geology

The Central Lode deposit consists of a main, rare-metal zoned pegmatite body, with a number of smaller footwall pegmatite dykes and pods. The main pegmatite strikes in a north to north-westerly direction (Figure 7) and dips moderately to steeply towards the west-southwest (Figure 8). Well-developed mylonitic fabrics occur, particularly along host rock contacts.

In general, the hanging wall is composed of amphibolite (meta-basalt and sub-volcanic intrusive bodies), whereas the footwall is granofels, dominantly of metasedimentary origin (Figure 8). The mine sequence has been intruded by Proterozoic dolerite dykes and sills (Figure 7). The main dolerite sill is intruded along the hanging wall contact zone. The dykes trend east-west and vary in width from a few centimeters to tens of meters.

The Kapanga deposit is situated some 300m east-northeast of Central Lode and comprises a series of sub-parallel stacked lodes and smaller pods of variable thickness, lying approximately 200m stratigraphically below Central Lode.

All rocks have been extensively lateritised during Tertiary peneplain formation, with resultant leaching of lithium; the laterite profile locally reaches depths in excess of 40m below the original surface.

## **Pegmatite Zoning**

The main Greenbushes pegmatite is about 3.5km in length and up to 300m in width. Internally, it consists of five mineralogically defined zones: the Contact Zone, Potassium Feldspar (Potassium) Zone, Albite (Sodium) Zone, Mixed Zone and Spodumene (Lithium) Zone. These are shown schematically in Figure 8; in detail they display complex zoning both along strike and at depth.

The zones occur as a series of thick layers commonly with a Spodumene Zone on the hanging wall or footwall, a Potassium Zone towards the hanging wall and a number of central Albite Zones. High-grade tantalum mineralisation (>420ppm) is generally confined to the Albite Zone, whereas the Spodumene and Potassium Feldspar Zones generally have tantalum-tin grades below the cut-off. However, in places the pegmatite may contain economically recoverable levels of both lithium and tantalum.

Zonation within the Kapanga pegmatites is broadly similar, with particular concentration of spodumene towards the upper part of the sequence.

# **Deposit Geometry**

The Central Lode pegmatite deposit extends over a strike length of 3.5km north-south (local mine grid) and has previously been sub-divided for practical purposes into four sectors representing past and present open pit operations, known as (from north to south) the Cornwall (tantalum only), C3, C2 and C1 pits (Figure 7).

However, recent drilling has demonstrated broad continuity at depth over the entire strike length and it can be considered as a single entity for resource and reserve modeling purposes. The overall pegmatite zone dips grid west at approximately 40°, has an overall thickness approaching 300m, and has been interpreted to a depth of over 600m below surface.

The Kapanga deposit lies some 300m east of Central Lode. It has been interpreted over 1.8km of strike and trends sub-parallel to Central Lode, dipping typically at 40-50° to the west-southwest, but steepening to 60° in the south. It comprises several stacked sub-parallel lodes of varying thicknesses, as well as smaller pods, with an overall thickness of approximately 150m, including intervening wallrocks. Mineralised pegmatite has been intersected by drilling to a depth of 450m below surface.

# **COMPETENT PERSON'S REPORT**





Greenbushes Lithium Operations

Figure 6 804-201 (03) November 2021 **REGIONAL GEOLOGY** 

# **COMPETENT PERSON'S REPORT**





Greenbushes Lithium Operations

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MINE GEOLOGY

# **COMPETENT PERSON'S REPORT**



Figure 8

BDA - 201 (03) November 2021

**CROSS SECTION - C3 PIT AREA** 

### Mineralogy

The main lithium-bearing minerals are spodumene (containing approximately 8% Li<sub>2</sub>O) and varieties kunzite and hiddenite. Minor to trace lithium minerals include lepidolite mica, amblygonite and lithiophilite. Lithium is readily leached in the weathering environment and thus is virtually non-existent in weathered pegmatite.

# **Conclusions**

BDA considers the Greenbushes geology and mineralisation to be generally well-defined and understood, supported by extensive mining and pit exposures. Exploration drill spacing is not sufficiently close to fully define internal variations within the pegmatite swarm, but is considered adequate for definition of Mineral Resources at the Indicated level.

### 4.3 Exploration, Geological and Resource Data

#### Introduction

Lithium production from the Greenbushes Mine has been undertaken continuously for over 30 years, during which time a comprehensive picture of the geology, geological controls and distribution of mineralisation has been developed, largely through drilling and from pit mapping. A majority of the exploration drilling was reported in detail in a NI 43-101 report prepared for Talison in 2012; additional drilling (196 drill holes out of a total database of 1,177 exploration drill holes on the Central Lode pegmatite, and 240 drill holes at Kapanga – refer Figure 9) has been completed since 2012 to delineate the Kapanga deposit, confirm continuations of the Central Lode deposit at depth and infill areas of lower confidence (Inferred) resources for the August 2021 resource model. Resource models were revised by Talison on a two-yearly basis from 2012, but the basic processes behind this work have varied little over that time. Reconciliation between various resource models, and mining and mill production has been consistently good since at least 2012, providing confidence in the geological understanding, validity of the resource database and the resource modeling approach.

The Greenbushes Mine Mineral Resources and Ore Reserves as of August 2021 have been developed by Talison and its consultants in compliance with the JORC Code 2012 Edition. The Greenbushes Mineral Resources and Ore Reserves Statement's Check List of Assessment and Reporting Criteria, referred to as Table 1 under the JORC Code, prepared by Talison for the Central Lode, Kapanga and TSF1 Mineral Resources and Ore Reserves is appended to this CPR. BDA has reviewed Greenbushes as an operating mine under the 2012 JORC Code. An outline of the exploration, geological and resource data is provided below.

## Exploration

Exploration relevant to the current lithium resources, reserves and mining operations has been undertaken on the property since the mid-1980s, first by Greenbushes Limited, then by Lithium Australia Ltd and by Sons of Gwalia prior to the acquisition of Greenbushes by Talison in 2007. Initial exploration focussed largely on tantalum, with the emphasis changing to lithium from around 2000. Information regarding exploration prior to that time is limited and incomplete, although data quality appears to have been sufficient to support profitable mine operations.

# **COMPETENT PERSON'S REPORT**

While surface exploration has proved useful in locating pegmatite bodies, weathering and associated leaching means that economic lithium mineralisation does not occur at surface. Consequently, diamond drilling ("DD") and reverse circulation ("RC") percussion drilling have been the primary tools for identifying lithium resources.

Exploration has also located several nearby pegmatite targets within the Greenbushes landholding, but currently defined in situ lithium resources are restricted to the Central Lode and Kapanga deposits, which still remain partly open at depth and along strike.

### **Geological Data Acquisition**

Data from a total of 1,177 drill holes totalling 194,375m of drilling form the basis for the August 2021 Central Lode lithium resource model. The drill database is made up of 560 RC holes, the remainder being either diamond drill holes or a combination of RC holes with DD tails. This total includes 228 underground diamond drill holes that targeted high grade tantalum mineralisation below the Cornwall pit. Figure 9 displays surface drill hole collars in relation to the pegmatite, highlighting the holes completed since 2012, which lie mainly within and to the west (down-dip) of C3, C2 and C1 pits.

A further 240 exploration drill holes (24 DD and 216 RC) for a total of 47,219m have been completed at Kapanga, all but one of which were drilled since 2017.

Geological and sample information is derived from a mixture of diamond drilling and RC drilling dating back over more than 30 years, although most of the drilling used to define lithium (as opposed to tantalum) resources has taken place since the year 2000. Drilling and sampling records, practices and procedures have varied over time, and there is a higher level of information available in the database for the more recent work.

Drilling is spread relatively uniformly along the Central Lode deposit, with the mineralisation defined on drill sections approximately normal to the strike of the pegmatites and 25m to 50m apart; irregular spacings occur within the open pits due to access issues. Drilling at Kapanga is largely on sections 50m apart with drilling at 40m intervals.

RC drilling mainly utilized 4.5 to 5.2 inch diameter face-sampling hammers, and samples were routinely collected over 1m intervals. Samples were largely dry and recoveries were reportedly high. Randomly selected RC holes had sample recoveries recorded by weight over the full length of the hole at the rig in Quality Assurance/Quality Control ("QA/QC") programs to confirm this observation.

DD holes varied between BQ, NQ and HQ core sizes, with triple tube used when coring through broken ground to maximize recovery. Some triple tube HQ drill holes have been completed for geotechnical purposes, with material sampled and results included in the resource database. Core recoveries were measured between core blocks for each drill run; recoveries were typically greater than 95%.

Drill cores were logged geologically and geotechnically in detail throughout their length, recording mineralogical and structural features. Logging was both qualitative and quantitative, depending on the sample characteristics being described. All core was photographed in the tray after mark-up and prior to sampling. RC holes were geologically logged at 1m intervals over their full depths and all logging information since 2001 was recorded electronically utilizing Excel logging templates.

# **COMPETENT PERSON'S REPORT**

Collars were surveyed by differential GPS, accurate to 10cm, and down-hole surveys were completed using an Eastman single-shot camera in earlier holes and later by gyroscopic or Reflex survey tool. Topographical control is excellent, as the mine site is covered with detailed and high quality survey datum controls as part of mine operations.

All of the above geological and survey information is captured in the site acQuire Technology Solutions Pty Limited ("acQuire") database.

#### Sampling, Sample Preparation and Analysis

Most drill core was cut in half with a diamond saw, although HQ core was sometimes quartered and one quarter used for assay analysis, another quarter used for mineralogical or metallurgical research and half retained as a record. Sampling was typically over 1m intervals, while honoring geological boundaries as required.

RC samples were collected at 1m intervals via a cyclone and split to approximately 3-4kg with either a riffle splitter, stationary cone or rotary cone splitter. The vast majority of RC samples were collected dry. More recent RC programs had 5% of the samples routinely duplicated at the drill rig. Field residues were collected in plastic storage bags and held to allow further sampling if necessary. Further sub-samples were split to provide duplicates for assay during the sample preparation process in the laboratory.

The lithium-bearing spodumene mineral generally represents between 15-55% of the mineralised portions of the pegmatite within the resource areas, averaging around 25% by weight. Both RC and diamond core samples are considered appropriately sized for the disseminated nature and relatively fine mineral grain size being sampled.

Sample preparation and analytical work have been undertaken at Talison's on-site laboratory since the inception of the mine, although a small number of early samples were tested off-site. The laboratory is part of the site-wide Quality Management System which is ISO 9001 certified through to September 2022.

The sample preparation flow sheet can be summarized as follows: all samples are dried for 12 hours at a nominal 110°C; thereafter samples are passed through primary and secondary crushers to reduce them to minus 5mm. A rotary splitter is used to separate an approximate 1kg sub-sample, which is ground in a ring mill to minus 100 microns ("-100µm"). Since 2011 tungsten carbide ring mill pulverization of samples was employed to minimize iron contamination.

All resource drilling sample pulp residues are retained in storage. Coarse sample rejects are normally discarded unless specifically required for further test work.

Due to the long history of operations at Greenbushes, the meta-data regarding early assaying is incomplete; however, the recording of analytical data has been at the current standard since at least as far back as 2006. As far as can be determined, all assaying of drill samples has been by X-Ray Fluorescence ("XRF") and Atomic Absorption Spectroscopy ("AAS"). Sodium peroxide dissolution and AAS is used for  $Li_2O$  determination, while a 36 element/oxide suite is analyzed by XRF following fusion with lithium metaborate.

### **Assay Quality Control**

QA/QC systems at Greenbushes have developed over time and vary across the datasets used for resource estimation. However, since at least January 2007 a rigorous QA/QC program has been in place, with the results captured in the acQuire database. Geological consulting group SRK Consulting (Australasia) ("SRK") (2021) noted that 40% of Central Lode data and essentially all of the Kapanga data are covered by this QA/QC program.

RC sampling practice involves collection of a duplicate field sample for every 20 RC samples submitted. Two samples of custom Certified Reference Material ("CRM"), i.e. known standards, made from run-of-mine ("ROM") Greenbushes feed targeting relevant grade values are submitted with each sample batch. Routine quality control for diamond core samples relies on internal laboratory controls (standards and blanks); duplicate core samples are not analyzed on a regular basis.

The laboratory's internal quality systems include replicate (pulp repeat) laboratory analyzes, analysis of known standards, and round-robin interaction with other laboratories. These systems are run on each batch of drill samples.  $Li_2O$  is not analyzed in replicates; instead, the AAS machine is recalibrated before every batch of samples, and standards and blanks are included in each batch.

The QA/QC data is assessed by Talison in terms of results for CRMs and blanks, scatter plots of duplicate and replicate RC sample assays, quantile-quantile ("Q-Q") plots and plots for half absolute relative difference ("HARD"). These show acceptable accuracy and sampling error. As examples, charts showing CRM lithium results for one of the standards accompanying drilling and a scatter plot of RC field duplicate analyzes are included (Figure 10).

All geological and sampling data post-2001 has been recorded in electronic format, utilizing Excel logging templates. The data is uploaded into the acQuire database, recording the data in tables covering survey, geology, sampling, assay and collar information. Data from earlier drill holes has been added to the database manually where available. The database procedure rejects invalid log codes on import as part of the built-in validation. Assay data is provided in electronic form from the laboratory and merged with the sampling information. A random selection of historical data has been compared to database records by Talison and by specialist resource consulting group, Quantitative Group Pty Ltd ("QG") to confirm the validity of historical data entry. Modern geological data is logged directly into spreadsheet templates and electronically imported into the database to avoid transcription errors. Modern assay data and some survey data is output by instruments in electronic format and imported into the database to avoid transcription errors. The database has a number of built-in logical checks to prevent invalid depth entries. Further validation of collar locations, hole orientations and comparisons of analytical results with geological logging is carried out by site geologists using a validation template.

An independent review of data quality was undertaken by QG as part of its December 2012 NI 43-101 Technical Report, from which it concluded that data quality at that time was adequate for estimation of lithium Mineral Resources and Ore Reserves. QA/QC procedures have been maintained for subsequent drill programs and have continued to produce reliable results, as noted by SRK in its review of available QA/QC data. This is confirmed by examination of QA/QC plots and also by the close reconciliation between resource models and mine/mill production (see Section 4.4).

# **COMPETENT PERSON'S REPORT**

# Density

Dry bulk densities ("BD") have been determined for a total of 2,071 samples of drill core from Central Lode, using water immersion techniques (Table 4.2). Three-quarters of these determinations were for pegmatite samples ranging in grade from 0 to 5.5% Li<sub>2</sub>O (Figure 11, upper), with the remainder representing granofels, amphibolite and dolerite wallrocks. Average grades for the latter have been used in the resource and reserve models, but the regression relationship BD =  $2.59 + (Li_2O \times 0.071)$  was determined for pegmatites and used within the resource and reserve models for both Central Lode and Kapanga.

# Table 4.2

#### **Bulk Density Determinations—Central Lode**

	Dry Bulk Density (t/m <sup>3</sup> )					
Lithology	Samples	Mean	Std Dev	Minimum	Maximum	
Pegmatite	1528	2.76	0.14	1.59	3.79	
Amphibolite	254	3.03	0.13	2.38	3.98	
Granofels	91	2.93	0.17	2.60	3.17	
Dolerite	198	2.98	0.15	2.53	3.71	

Note: source of data: SRK 2021

Lithium resources lie beneath the weathered (oxidized) zone. Oxide waste material has been assigned a bulk density of 1.8t/m<sup>3</sup>, which is supported by past site mining records in the form of production truck counts versus survey measurements.



TALISON ASSAY QA/QC:





# **Tiangi Lithium Corporation**

Greenbushes Lithium Operations

Figure 10

DRILL SAMPLING QA/QC

BDA - 201 (03) November 2021



**Tiangi Lithium Corporation** 

Greenbushes Lithium Operations

Figure 11	<b>CENTRAL LODE MODELLING - PART 1</b>		
BDA - 201 (03) November 2021	Behre Dolbear Australia Pty Ltd		

# Conclusions

BDA has not undertaken an audit of the geological, survey, density and assay data as part of this review. However, BDA has reviewed data acquisition and quality control procedures and QA/QC

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results presented by QG in its 2012 NI 43-101 report, by SRK in the most recent resource estimate (2021), and by Talison, including results from recent drilling programs, and concludes that database quality is appropriate and adequate for estimation of Mineral Resources and Ore Reserves under the JORC Code. The historical close agreement between estimated resources, mining and mill tonnages and grades provides significant support to data quality and accuracy.

However, SRK identified an apparent positive bias for  $Li_2O$  in RC samples from Kapanga compared to adjacent diamond drill hole samples, from what was a relatively small dataset. This has potential to affect the resource estimate and requires additional investigation, particularly at Kapanga where RC drilling provides the bulk of the resource database. A similar bias has been noted by Talison from grade control (blast hole) samples, and a 5% reduction is applied when predicting mill head grades.

## 4.4 Mineral Resource and Ore Reserve Estimation

# **JORC** Definitions

The Tianqi Mineral Resources and Ore Reserves have been classified according to the definitions of the JORC Code. A summary of the principal sections follows; for a full description see the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves— The JORC Code—2012 Edition—Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists, and Minerals Council of Australia.

#### Mineral Resources

A Mineral Resource is a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such a form, grade (or quality) and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade (or quality), continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling. Mineral Resources are sub-divided, in order of increasing geological confidence, into Inferred, Indicated and Measured categories.

- A *Measured Mineral Resource* is that part of a Mineral Resource for which quantity, grade (or quality), densities, shape and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit. The nature, quality, amount and distribution of data are such as to leave no reasonable doubt that the tonnage and grade of mineralization can be estimated to within close limits and that any variations from the estimate would be unlikely to significantly affect potential economic viability. A Measured Mineral Resource may be converted to a Proved Ore Reserve (or to a Probable Reserve where circumstances other than geological confidence suggest that a lower confidence level is appropriate).
- An *Indicated Mineral Resource* is that part of a Mineral Resource for which quantity, grade (or quality), densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. The nature, quality, amount and distribution of data are such as to allow confident interpretation of the geological framework and to assume continuity of mineralization. An Indicated Mineral Resource may be converted to a Probable Ore Reserve.

• An *Inferred Mineral Resource* is that part of a Mineral Resource for which quantity and grade (or quality), are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply, but not to verify, geological and grade (or quality) continuity. It is based on exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. Confidence in the estimate of Inferred Mineral Resources is not sufficient to allow the application of technical and economic parameters to be used for detailed planning studies. An Inferred Mineral Resource must not be converted to an Ore Reserve.

#### Ore Reserves

An Ore Reserve is the economically mineable part of a Measured and/or Indicated Mineral Resource. It includes diluting materials and allowances for losses which may occur when the material is mined or extracted and is defined by studies at Pre-Feasibility or Feasibility level that include application of Modifying Factors. Such studies demonstrate that, at the time of reporting, extraction could reasonably be justified.

*Modifying Factors* are considerations used to convert Mineral Resources to Ore Reserves and include mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governmental factors.

- A *Proved Ore Reserve* is the economically mineable part of a Measured Mineral Resource. A Proved Ore Reserve implies a high degree of confidence in the Modifying Factors (and the geological factors).
- A *Probable Ore Reserve* is the economically mineable part of an Indicated Mineral Resource (or in some circumstances a Measured Mineral Resource). The confidence in the Modifying Factors applying to a Probable Reserve may be lower than that applying to a Proved Ore Reserve.

Tianqi's Ore Reserves represent those portions of the Mineral Resources which can be mined economically under the defined parameters, and which are planned to be mined within a designed open pit. The Ore Reserves are included within the overall Mineral Resources (i.e. the Mineral Resources are stated inclusive of resource material used in the Ore Reserve estimate). Measured and Indicated Mineral Resources that are not included in Ore Reserves do not have demonstrated economic viability or are excluded due to other Modifying Factors. Tianqi's Proved and Probable Ore Reserves are based on Measured and Indicated Mineral Resources respectively.

### **Mineral Resource Modeling and Estimation Procedures**

The August 2021 resource model was created by SRK with input from Talison, but is built on the approach developed by Talison and QG over several iterations between 2007 and 2018, plus a comprehensive 2020 resource modeling exercise completed on Central Lode by SRK (North America) ("SRK (NA)") in 2020.

In summary, geological models were developed separately for Central Lode and Kapanga using Leapfrog Geo to define coherent pegmatite, amphibolite, granofels and dolerite bodies using exploration drilling, logging and geochemical data, augmented, where available, by grade control samples and pit mapping data. Envelopes of continuous mineralisation above a nominal 0.7% Li<sub>2</sub>O cut-off grade were identified within the pegmatites and grade modeling of Li<sub>2</sub>O was undertaken using

Ordinary Kriging ("OK") for both mineralised and low grade pegmatite domains. Density was calculated or assigned for each cell based on lithology and  $Li_2O$  grade in the case of pegmatite cells, as described in Section 4.3. The resource model was constrained by a mine survey surface as of August 31, 2021 for reporting of resources within a breakeven pit shell determined by Whittle optimisation.

In more detail, resource modeling involved the following activities and assumptions:

- A chart of raw drill sampled lengths plotted against corresponding Li<sub>2</sub>O assays showed the whole range of Li<sub>2</sub>O grades across all sample lengths, i.e. there was no spike of short, high grade intervals. One meter was by far the dominant sampling interval used in RC drilling and for much of the diamond core within pegmatite away from geological contacts, so drill data was subsequently composited on 1m intervals.
- Comparison between RC and diamond drill sample results showed no significant difference in overall grade distributions for Central Lode. However, based on results from a small database of eight adjacent DD and RC holes at Kapanga, SRK noted a potential positive bias towards higher Li<sub>2</sub>O and Fe<sub>2</sub>O<sub>3</sub> values and lower SiO<sub>2</sub> values in the RC results, which could be ascribed to selective loss of lighter elements such as quartz. This remains to be confirmed.
- Geological wireframing of the Central Lode pegmatites, and other lithologies was originally completed by SRK (NA) in 2020 using Leapfrog Geo implicit modeling techniques. The model utilized the exploration drilling geological database, with guidance from pit mapping, and from grade control and blast hole drill information. Talison reviewed the resultant wireframes against cross-sectional interpretations and was satisfied with the final product. SRK updated the model to include an additional 14 holes completed in 2021 and made minor revisions to the wireframes to allow merger with the Kapanga model and a stockpile model into a single resource model.
- The Kapanga geological model was initially developed by Talison in 2020, again using the exploration database and Leapfrog Geo to define pegmatite, granofels, dolerite and amphibolite domains. SRK revised the model in 2021 to include data from an additional six drill holes, and the model was checked and approved by Talison. It should be noted that the Kapanga pegmatite swarm comprises several individual pegmatite lenses, with inclusions of country rock, compared to the one of two massive pegmatite bodies present through Central Lode. In addition, as Kapanga is unmined, highly weathered and slightly weathered domains with different grade characteristics have been defined by surfaces within the geological model.
- A histogram of declustered Li<sub>2</sub>O composite data for Central Lode pegmatites for the 2018 model showed a low grade Li<sub>2</sub>O population and a less distinct higher grade Li<sub>2</sub>O population (Figure 11, lower). A grade of 0.7% Li<sub>2</sub>O was chosen as an effective grade domain boundary to separate the two populations for Central Lode. This boundary value was re-assessed by SRK and deemed to be appropriate. Wireframes were developed by SRK within the pegmatite domains to constrain the most continuous zone of lithium mineralisation >0.7% (Figure 12, upper), using an indicator approach. The results were checked by Talison against drill hole data and sectional interpretations. The 0.7% Li<sub>2</sub>O value was examined for Kapanga composite data by SRK and was again found to be appropriate for interpretation of mineralised pegmatite wireframes.
- Samples were coded by the lithology and mineralisation wireframes and then composited to 1m lengths for use in statistical and geostatistical analysis.
- A histogram of declustered Li<sub>2</sub>O composite values within the mineralisation wireframe (Figure 12, lower) showed a relatively normal population, which was deemed suitable for grade estimation by OK.
- A 20m x 20m x 20m cell block model was created for both the Central Lode and Kapanga deposits, with 5m x 5m x 5m sub-cells to improve geometric definition of domain boundaries. These dimensions take account of the drill hole spacing, sampling interval and interpreted geometry and thickness of the mineralisation. Central Lode drill hole spacing varies from 25 x 25m up to 50 x 50m, except locally in the north where underground drilling into the dominantly tantalum ore-body was on closer spacing. At Kapanga, drilling is on an approximate 50 by 40m grid. All planned future mining is by open pit, with minimum mining widths of 5m.
- The upper topographic surface used for the model was provided by Talison and is understood to be from December 2008.
- SRK elected to re-composite the pegmatite sample data to 3m for further statistical and geostatistical analysis. Comparison of raw and 3m composite data for Li<sub>2</sub>O showed no statistical difference between the two populations.
- Log probability plots indicated that top-cutting of outlier values was unnecessary. Instead SRK elected to restrict the range of influence of values >5.5% and 3.0% Li<sub>2</sub>O during grade estimation for the mineralised and unmineralised pegmatites, respectively.
- A variographic study of Li<sub>2</sub>O and six other elements<sup>2</sup> was undertaken using industry standard Supervisor software to determine grade continuity in each pegmatite domain on Central Lode. Variography used normal-score transforms of the 3m composites with back-transforms applied to the theoretical models which were then imported into Leapfrog Edge for use in grade estimation.
- A similar approach was adopted for Kapanga, although 1m composites were used in variography and grade estimation, both of which were undertaken using Studio RM.
- SRK observed very good Li<sub>2</sub>O variogram definition in the mineralised pegmatite domain at Central Lode with a very low nugget value, a practical range in the order of 100m (80% of the sill) and a total range of approximately 350m (Table 4.3). Mid and Minor ranges are approximately 70% and 25%, respectively, of the Major range. Variogram definition is poorer in the non-mineralised, i.e. < 0.7% Li<sub>2</sub>O domain with a higher nugget, a practical range of approximately 50m and a total range of 100m. Figure 13 shows the variogram models for the mineralised domain and Table 4.3 provides the variogram parameters.

<sup>&</sup>lt;sup>2</sup> Statistical and geostatistical analysis was also undertaken for Ta<sub>2</sub>O<sub>5</sub>, SnO<sub>2</sub>, Fe<sub>2</sub>O<sub>3</sub>, MnO, Na<sub>2</sub>O and K<sub>2</sub>O on Central Lode and for the first three oxides at Kapanga, but these were not reported in the resources and reserves, and are not considered further in this report

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# Table 4.3

# Variogram Parameters - Li<sub>2</sub>O - Central Lode Pegmatite

Domain		Direction		Structure 1					Structure 2				
	Dip	Dip Dir	Pitch	Nugget	a1	<u>a2</u>	<u>a3</u>	C1	a1	a2	<u>a3</u>	C1	
Mineralised	45	260	5	0.05	66	41	63	0.48	360	250	85	0.47	
Low Grade	45	260	5	0.08	25	3	20	0.48	122	95	22	0.18	

Notes: a = range in meters, C = proportion of variance

• Similar results of variographic analysis for Li<sub>2</sub>O were reported for the main pegmatite zones at Kapanga, although the nugget was appreciably higher, which was believed to reflect the change from 3m to 1m composites at Kapanga. Variogram parameters are provided for the two main pegmatite domains, identified by SRK as 309 and 319, in Table 4.4, and model variograms are shown in Figure 13 (lower).

# Table 4.4

# Variogram Parameters - Li<sub>2</sub>O - Kapanga

Domain	]	Direction				Stru	cture	e 1	1	Struct	ure	2	1	Struct	ure	3
	Major	Mid	Minor	Nugget	a1	a2	a3	C1	a1	a2	a3	C1	a1	a2	a3	C1
309	-50/270	00/180	40/270	0.36	87	85	28	0.38	174	512	68	0.11	215	855	94	0.15
319	-50/270	00/180	40/270	0.27	21	33	30	0.22	93	61	72	0.26	367	270	82	0.25

Notes: a = range in meters, C = proportion of variance

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**CENTRAL LODE MODELLING - PART 2** 

Figure 12 804 - 201 (03) November 2021

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Modelled Variograms, Mineralised Pegmatite Domains

**Tiangi Lithium Corporation** 

Greenbushes Lithium Operations

Figure 13 BDA - 201 (03) Nover ber 202 VARIOGRAPHY - MODELLED VARIOGRAMS

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OK was used for Li<sub>2</sub>O grade estimation into discretised (3x3x3) parent cell locations in both deposits, using different estimation parameters derived from the variographic studies of the two databases. Mineralised and low grade pegmatite domain contacts were treated as soft boundaries at Central Lode allowing composites a short distance outside the

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contacts to inform cells within the domain. However, hard boundaries were employed for Kapanga. Variable orientation searching was applied to Central Lode, whereby, for each model cell, the search ellipsoid was oriented to match the orientation of the pegmatite. However, for Kapanga the search ellipsoid was oriented parallel to the general orientation of the lithological units.

- A two-pass search strategy was used for Central Lode with the first pass search distances approximately corresponding to the distance at which 80% of the sill was reached. The second pass was approximately equivalent to the variogram range, which was roughly twice as long as the first pass. The search distances for outlier values were limited to 5% of the ellipsoid range.
- For Kapanga a three pass strategy was adopted, the first extending approximately to the distance at which 80% of the variogram sill was reached, the second doubling the distance and the third tripling it. Sample selection criteria were also loosened for the second and third passes.
- A summary of the estimation parameters used are provided in Table 4.5 and Table 4.6 for Central Lode and Kapanga, respectively.

# Table 4.5

# Estimation Parameters - Li<sub>2</sub>O Central Lode Pegmatites

Domain	Pass	Search Distance			No. Samples		Quad	rants	Max Samples	Threshold	
		Max	Mid	Min	Max	Min	Max Sample	Min Sector	per Hole	Grade	
Mineralised	1	180	150	25	15	5	5	3	2	5.5	
	2	360	250	50	15	1			2	5.5	
Low Grade	1	180	150	25	15	5	5	3	2	3	
	2	360	250	50	15	1			2	3	

#### Table 4.6

#### Estimation Parameters - Li<sub>2</sub>O Kapanga Pegmatite Domains 309 and 319

Domain		Rotation		S1 distance			S1 samples		S2 samples		S3 samples		Samples
	Z	X	Z	Main	Mid	Minor	Min	Max	Min	Max	Min	Max	per Hole
309	-90	50	-90	100	100	20	8	20	7	20	2	15	3
319	-90	50	-90	100	100	20	8	20	7	20	2	15	3

- Density values were calculated for each pegmatite cell based on a regression formula applied to Li<sub>2</sub>O estimates for the cell, while average values were applied for all other lithologies as described in Section 4.3. Identical methods were used for Kapanga.
- The resultant resource block models were validated visually to confirm that all blocks had been estimated and that block cell grades generally conformed to adjacent drill hole composite values. Figure 14 provides example cross-sections through Central Lode and Kapanga, showing block and drill Li<sub>2</sub>O grades. A series of swath plots through both deposits confirmed good correlation between average composite and block grades across the deposits. Generally, the estimated block grades were close to, but lower than the composite grades. Local grade trends were confirmed in the model, with an expected and acceptable degree of smoothing of input data. Statistical analysis demonstrated that there was acceptable correspondence between sample composite and model grades.

• SRK also examined estimation performance data in terms of search pass, number of samples informing the estimate, average distance and slope of regression. Results for the mineralised domains at Central Lode are included in Table 4.7, indicating that over 90% of blocks defined as Indicated were informed in the first pass. Moreover, approximately 95% of the mineralised blocks had a slope of regression above 0.6, which is typically considered the norm for definition of Indicate Resources.

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CENTRAL LODE Section 12 180 N - Through Block Model



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#### Table 4.7

# Estimation Performance Data for Li<sub>2</sub>O Estimates—Central Lode Pegmatites

Domain	Class	Pass	% Tons	Average Number of Samples	Average Distance (m)
Mineralised	Indicated	1	93	8	48
	Indicated	2	7	15	101
	Inferred	1	40	6	90
	Inferred	2	60	12	141
Low Grade	Indicated	1	98	8	28
	Indicated	2	2	15	33
	Inferred	1	31	8	74
	Inferred	2	69	12	173

Similar outcomes were observed for estimation performance data at Kapanga (Table 4.8)

Table 4.8

#### % Resource Estimated in Each Pass Domain Average Number of Samples Pass 2 Pass 3 Pass 1 Default Pass 1 Pass 2 Pass 3 Indicated 309 ..... 0 91.3 8.7 0 17 20 14 319 ..... 97.6 2.4 0 0 18 20 15 Inferred 309 80.5 4.2 0 10 17 15 15.3 319 ..... 28.8 64.5 6.7 0 10 19 15

# Estimation Performance Data for Li<sub>2</sub>O Estimates—Kapanga Pegmatites

# **Mineral Resource and Ore Reserve Classification**

Resource classification was undertaken by SRK in accordance with the JORC (2012) Code, taking account of confidence in the geological interpretations, data quality, estimation techniques and likely economic viability. For Greenbushes, the largest uncertainty was considered to be the reliability of the local grade estimate and the accuracy of lithological interpretations, both being influenced by drill hole spacing. The average sample distance, number of informing samples and slope of regression data were used to assign a preliminary classification for each cell in the model as either Indicated or Inferred, and this information was used to define and wireframe coherent broad areas of like classification which were then used to determine the final classification coding. In this way, local occurrences of Indicated Resource cells were reassigned to the Inferred category and vice versa. Figure 15 includes classification coding on example cross-sections through Central Lode and Kapanga.

The Measured Mineral Resource classification was restricted to surface ROM and fine ore stockpiles. Surface stockpiles comprising non-ROM material that is used for blending or as storage for lower grade material were classified as Indicated and, occasionally, Inferred resources.

The Indicated Resource classification for the in situ mineralisation took account of good geological understanding of the deposit, as well as confidence in the quantity, distribution and quality of the data, grade continuity and the modeling approach. Inferred Resources were restricted to peripheral parts of the deposit where wider drill spacing reduces the certainty of lithological interpretation and local grade estimates.

#### **Mineral Resource Reporting**

The reported Mineral Resources are almost entirely in situ. These lie within the Central Lode and Kapanga pegmatites and have been constrained within a single, break-even optimized pit shell (Figure 15, upper) using the latest mining parameters, costs, process recoveries and revenues. The reporting cut-off grade for Mineral Resources is 0.5% Li<sub>2</sub>O, which is approximately the economic break-even grade for the existing plants. The reported resources are on a dry tonnage basis and make no assumptions about selective mining within blocks.

For this BDA review, Mineral Resources are reported as of December 31, 2021 (Table 4.9). The Mineral Resources for Central Lode and Kapanga were calculated to August 31, 2021 by Talison and its consultants as 342Mt at 1.6% Li<sub>2</sub>O based on the 2021 resource block model cut by the surveyed surface from the end of August 2021. This total includes 4.9Mt of stockpile material at surface. In the period from September 1, 2021 to December 31, 2021 Talison processed 1.4Mt of ore at 2.4% Li<sub>2</sub>O and the Indicated Resources have been depleted for this production. The ore mining over the period September to December 2021 totalled 1.2Mt at 2.4% Li<sub>2</sub>O, 0.2Mt below the processed amount requiring some drawdown of stockpiles for plant feed. Resources at TSF1 are not considered as part of this total.

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**Break-Even Pit Shell for Resource Reporting** 



Figure 15 804 - 201 (03) November 2021 RESOURCE MODEL REPORTING

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#### Table 4.9

#### Greenbushes Lithium Mineral Resources at December 31, 2021

Resource Category	Tonnage (Mt)	Li <sub>2</sub> O Grade (%)	LCE (Mt)
Measured Resources (Stockpiles)	0.5	3.2	0.04
Indicated Resources (in situ plus minor stockpiles)	229.7	1.8	10.3
Inferred Resources (in situ plus minor stockpiles)	110.3	1.0	2.7
Total Mineral Resources	340.5	1.6	13.1

Note: the resources are based on the 2021 resource model as of August 31, 2021 and the Indicated Resources have been depleted for the subsequent production through to December 31, 2021; there may be some rounding errors in totals; a cut-off grade of 0.5% Li<sub>2</sub>O was used for reporting resources; the derivation of lithium carbonate equivalent is tons x (% Li<sub>2</sub>O/100) x 2.473 = tons LCE; Indicated resources are largely in situ, constrained within pegmatite and lying within a break-even optimized pit shell; no allowance has been made for subsequent mining and processing; the summary above excludes Mineral Resources in TSF1

At Central Lode as of August 31, 2021, the Indicated Resources were 189.9Mt at 1.8% Li<sub>2</sub>O and Inferred Resources were 104.6Mt at 1.0% Li<sub>2</sub>O giving a total Mineral Resource at Central Lode of 294.5Mt at 1.5% Li<sub>2</sub>O. After depleting the Indicated Resources for subsequent production the Central Lode Indicated Resources are 188.5Mt of ore at 1.8% Li<sub>2</sub>O giving a total Mineral Resource at Central Lode of 293.1Mt at 1.5% Li<sub>2</sub>O. For Kapanga, the Indicated Resources are 38.6Mt at 1.8% Li<sub>2</sub>O and Inferred Resources are 3.9Mt at 1.9% Li<sub>2</sub>O giving a total Mineral Resource at Kapanga of 42.5Mt at 1.8% Li<sub>2</sub>O. The remainder of the total Mineral Resource shown in Table 4.9 (4.9Mt) is contained within existing surface stockpiles.

#### **Ore Reserve Reporting**

Ore Reserve classification is dependent on the underlying Mineral Resource classification, once mining, processing, economic and other parameters have been taken into account. Measured Mineral Resources in stockpiles have been converted to Proved Ore Reserves, while Indicated Mineral Resources become Probable Ore Reserves where appropriate mining, processing and economic parameters are satisfied. All Ore Reserves are contained within the Mineral Resources.

At the outset, it should be noted that all Mineral Resources reported for the Central Lode lie directly below or immediately along strike from the existing open pits which, themselves, have been mined continuously for over 30 years. Further, there is no indication that the geology, grade distribution, mining or processing characteristics will change materially as production continues into these areas. Although Kapanga displays some differences in geology in the sense that the pegmatite swarm is less regular and contains local wallrock inclusions, the mineralogy and grade distribution characteristics are similar, while metallurgical testwork has demonstrated its amenity to treatment in the existing plants.

As described in Sections 4.5-4.10 of this document, additional geotechnical, mine design and scheduling studies have been completed, and existing plant capacity and planned plant expansions will be available to treat the proposed mine production. Capacity is provided in existing and planned waste rock and tailings dams and other infrastructure to match the proposed schedule, although further planning will be required to better define the extensions of waste dump and tailings capacities for the LOM.

Financial analysis has been undertaken to demonstrate that identified parts of the Mineral Resource can be mined and treated profitability. All the above information was reviewed and

confirmed by BDA for the purpose of this report. Consequently, BDA considers that the 2021 Ore Reserves developed from the 2021 Mineral Resources conform to the JORC Code.

As described in more detail in Section 4.5, Ore Reserves were determined by Talison, based on Whittle 4-X optimisation of the August 2021 resource model, using current overall pit wall and mining criteria, the latest mining and processing costs and process recoveries, and predicted product pricing. A block cut-off grade of 0.7% Li<sub>2</sub>O was applied; such material is economic to treat through the existing plant, although lower grade material is currently stockpiled in favor of treating more profitable ore.

Using the selected pit shell as a guide, established pit design criteria were used to determine mine designs. The mine schedule was developed based on predicted future mill performance and capacity, and projected sales of TG and CG product at that time. No allowance was made for ore loss or dilution, based on historically close reconciliation between earlier resource models and past mine production, although previously a 5% reduction in grade was applied to all resource block grades when reporting reserves. The ore zones within the Kapanga pit are not as wide as found in Central Lode and the dilution parameter may need to be reviewed when mining commences.

Ore Reserves totalled 169.6Mt at 2.0% Li<sub>2</sub>O, containing 8.3Mt LCE, as of August 30, 2021, including 0.5Mt of Proved ore reserves in run-of-mine (ROM) and fine ore stockpiles and 2.6Mt of non-ROM stockpile material classified as Probable ore reserves. An additional 10.1Mt at 1.4% Li<sub>2</sub>O exists within TSF1 (Section 4.13).

In the period from September 1, 2021 to December 31, 2021 Talison processed 1.4Mt of ore at 2.4% Li<sub>2</sub>O. Taking the August 31, 2021 Ore Reserve and deducting the ore quantities processed from the Probable Reserves the depleted Ore Reserves, including the stockpiles, were 168.1Mt at 2.0% Li<sub>2</sub>O at December 31, 2021 (Table 4.10).

# **Table 4.10**

# **Greenbushes Lithium Ore Reserves at December 31, 2021**

Reserve Category	Tonnage (Mt)	Li <sub>2</sub> O Grade (%)	LCE (Mt)
Proved Ore Reserves (Existing Stockpiles)	0.5	3.2	0.04
Probable Ore Reserves	167.6	2.0	8.2
Total Proven and Probable Ore Reserves	168.1	2.0	8.3

Note: there may be some rounding errors in totals; all tons are dry tons; Probable Ore Reserves are largely derived from the 2021 resource block model and within an optimized pit shell with a Mine Cost Adjustment Factor (MCAF) of 0.30 and adjusted for the production between September and December 2021; a block cut-off grade of 0.7% Li<sub>2</sub>O has been applied; the derivation of lithium carbonate equivalent (LCE) is tons x (%Li<sub>2</sub>O/100) x 2.473 = tons LCE; Proved Ore Reserves comprises the Run of Mine and Fine Ore stockpiles; Probable Ore Reserves include a small proportion of non-ROM stockpile material, plus the in-situ reserve; no adjustment has been made to allow for subsequent mining and processing activities; Reserves exclude Probable Reserves at TSF1.

The 2021 Ore Reserve represents an approximate increase of 27% in tonnage over the previous, internally reported (March 2018) reserves, despite mining of over 8.9Mt in the intervening period. This increased tonnage comes partly as a result of exploration drilling which led to delineation of the Kapanga deposit while further drilling has located or firmed up confidence in extensions to the Central Lode mainly at the northern end of C3 and down-dip at C2.

#### **Mine Reconciliation**

Reconciliation between the previous (March 2018) resource block model, mine production and mill reconciled data in the years 2015 to 2020 demonstrated significant short-term (monthly) variation as would be expected, given the relatively small scale of production and the spacing of exploration drilling. However, reconciliation on a yearly basis was extremely close (within 5%) in terms of both tonnage and contained metal.

Talison provided reconciliation data for 2021 (to the end of September), between both the new resource model, the 2018 model and mill reconciled production. On this basis the new model appears to overestimate tonnage, while underestimating grade, with a closer approximation to the mill's contained metal than the earlier model, but the time period is too short and there are too many uncertainties in mill production related to stockpile movements and teething problems with the CG2 weightometers to form any firm conclusions.

SRK (NA) undertook reconciliation between a slightly earlier version of the 2021 model – which employed the same methodology as the 2021 model, but did not include results from ten peripheral, recently completed drill holes included in the SRK model – and reconciled mine production data based on truck counts and blast hole drill sampling for the years 2017 to 2019 (Table 4.11). SRK (NA) noted "very reasonable performance of the current mineral resource estimation against the reconciled production periods", although there appears to be a tendency for the model to predict approximately 5% more tons at a very slightly higher grade over this period. However, there is inevitably some doubt in the accuracy of the reconciled mine production figures.

#### **Table 4.11**

#### 2020 Resource Model **Mine Reconciled Production** % Difference Tonnage Grade Li<sub>2</sub>O LCE Tonnage Grade Li<sub>2</sub>O LCE Ore Tons LCE Year % Mt % % % kt kt kt 97 95 2017 1.67 2.88 119 1.63 2.79112 2018 2.17 2.86 153 2.10 2.77 144 97 94 2019 ..... 2.72 2.80188 2.53 2.83 176 92 93

#### Reconciliation of Central Lode Mineral Resource and Ore Mined—Years 2017-2019

Notes: source SRK (NA) from an earlier version of the 2021 model; reconciled mining numbers are the grade-controlled drill and blast material excavated from the open pit, including stockpile movements, the latter introducing some potential errors

# **Mineral Resource and Ore Reserve Upside Potential**

Potential remains to increase resources as extensions at depth and along strike from the known resources on Central Lode and Kapanga. However, the potential economic value of the depth extensions to Central Lode, in particular, is considered relatively low, with the 2021 break-even resource pit-shell already impacting slightly on existing plant and other infrastructure. Underground mining could, perhaps, be contemplated, but no such investigations have been undertaken.

Potential also exists at several nearby prospects extending south along strike from C1 for well over a kilometer, and including the Vulcan, Ladybird, Teddy Boy and White Wells prospects (Figure 16). These have not yet been drill-tested, but they assume some importance as they lie in areas designated for development of additional waste and tailings storage capacity in the relatively near term.

There are indications of northern extensions of the pegmatite swarm for at least 3000m from Cornwall North through to New Zealand Gully (Figure 16). These remain largely unexplored, although much of this zone lies under or very close to Greenbushes townsite and undoubtedly would impact the community.

Drilling of the original Greenbushes tailings disposal area, TSF1, located adjacent to CGP2 and the C1 pit (Figure 4) and used prior to the start of lithium operations, has confirmed a more or less continuous zone of >1% Li<sub>2</sub>O grades in the upper part of the tailings facility. Geology, drilling, resource estimation and Resource and Reserve reporting are described in Section 4.12. There is at best very limited potential to add to the identified tailings reserves, should the lithium price or operating costs improve and part of the DZ become economic.

# **Independent Review of Mineral Resources and Ore Reserves**

Talison recently commissioned RSC Consulting Services ("RSC") to undertake a high level "fatal flaw" review of the 2021 Mineral Resources and Ore Reserves, based on SRK's draft report and discussions with SRK and Talison. A site visit was made as part of this work.

RSC concluded that the work had been undertaken to a high technical standard and that no fatal flaw exists. Its report did point to a low to moderate concern regarding a) the potential RC  $Li_2O$  grade bias noted at Kapanga; b) potential sensitivity of the resource model to the use of 0.7%  $Li_2O$  as the basis for defining mineralised pegmatite wireframes; and c) the geometrical consistency between composite sizes and the geometry of the models.

# **Conclusions**

From its review, BDA considers that database compilation for the Central Lode and Kapanga deposits has been undertaken by suitably qualified and experienced Talison staff, under the supervision of a Competent Person under the JORC code with over five years of experience on the site. Data validation has been completed, confirming generally acceptable database quality, and the geological definition of the deposits is considered to be well-founded. One exception to this is the indication that RC drilling at Kapanga returned higher Li<sub>2</sub>O grades compared to adjacent diamond drilling. Both SRK and RSC recommended that this potential bias should be further investigated, as it has potential to lead to over-estimation of  $Li_2O$  grades in this part of the Mineral Resource and Ore Reserve model.

The drill data gives acceptable coverage of the lithium mineralised zones and provides a suitable basis for Mineral Resource estimation. The Mineral Resource modeling approach and Mineral Resource classification procedures have been undertaken by a well-credentialed consulting group under the supervision of a highly experienced professional who is considered a Competent Person under the JORC Code.

An independent review confirmed that the Mineral Resource modeling methodology was appropriate, in accordance with industry standards, and in compliance with the JORC Code. The 2021 Mineral Resources have been independently estimated for Talison by SRK Consulting (Australasia) Pty Ltd and supervised by Daryl Baker, Talison Geology Superintendent<sup>3</sup> who is a suitably qualified and experienced professional as required by the JORC Code.

<sup>&</sup>lt;sup>3</sup> Daryl Baker is a member of the AusIMM (Membership number 221170)

# **COMPETENT PERSON'S REPORT**

BDA considers that the 2021 Mineral Resource model complies with the 2012 JORC Code and forms an acceptable basis for mine planning and generation of Ore Reserves. In turn, the Mineral Resources reported as of the end of August 2021 are considered a reasonable estimate of the remaining Mineral Resources within the modeled area at that time. However, BDA considers there would be value in undertaking further comparisons between the performance of the 2021 Mineral Resource model, the previous (2018) model and mine production since 2015.

BDA has reviewed the 2021 Ore Reserve estimate for Central Lode and Kapanga, and has found it to have been completed in accordance with industry standards, and in compliance with the JORC Code. The 2021 Ore Reserves have been prepared by Mr Andrew Payne, Talison Mine Planning Superintendent<sup>4</sup> who is a suitably qualified and experienced professional as required by the JORC Code and a Competent Person under the Code. BDA considers the mine design for the open pits to be appropriate and supported by over 30 years of past mining practice at the deposit. The mining schedule is considered to be achievable but it is noted that further optimisation of the schedule is ongoing. BDA does not consider the Ore Reserves will be materially affected by foreseeable permitting, title, environmental, or metallurgical issues, based on the information supplied by Talison.

Overall BDA considers the 2021 Proved and Probable Ore Reserves to be an appropriate representation of the recoverable tons and grade, and suitable for use in financial modeling of the project. However, the removal of a 5% grade reduction for Mineral Resource blocks in arriving at the Ore Reserve model (as used in previous Ore Reserve models) could lead to a slight over-estimation of recoverable spodumene concentrates.

<sup>&</sup>lt;sup>4</sup> Andrew Payne is a member of the AusIMM (Membership number 308883)

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There are Indicated and Inferred Mineral Resources lying between the break-even pit shell used for reporting Mineral Resources and the mine design pit shell. These have some potential economic value and could eventually be added to the Ore Reserves depending on lithium markets, prices, product specifications, plant performance, and plant operating costs. Additional potential exists to expand the Mineral Resources to include deeper pegmatite mineralisation, although open pit extraction is unlikely as the final pit limits of the 2021 mine plan are very close to existing process infrastructure.

Exploration is planned to cover the northern and southern extensions to the pegmatite swarm, with emphasis on areas identified as required for future waste rock, tailings or other infrastructure. However, no significant mineralisation has been intersected to-date.

# 4.5 Mining

# Overview

Open cut mining of lithium ore is currently from the Central Lode open pits, south of the Cornwall Pit which was mined up to 2003 predominantly for tantalum ore before mining went underground via a decline. The higher grade lithium ore is mined from a distinct zone within the pegmatite on the hanging wall side of the C3 (North) zone and from the large zone within the C1 (South) zone (Figure 7).

The mining plan involves a series of stages, including eastern and western cutbacks of the C1 and C3 pits. The eastern cutback of C3 pit, which has commenced, is in two parts, Central and East, with the Central cutback of the east wall being taken down initially before moving to the southern wall and taking out the saddle between the C3 and C1 pits, within the area referred to as the C2 pit. During the 21-year period scheduled, the overall Central pit will have a number of staged cutbacks involving both the east and west walls as well as the mining of the Kapanga pit to the east of the C1 pit.

The existing Central pit area extends around 2,000m north-south with C3 pit being around 700m east-west and C1 being around 350m east-west. Kapanga pit extends approximately 1,300m north-south and 700m east-west. C3 pit bottom is currently at 1150mRL (around 175m deep) and C1 pit bottom is at 1180mRL (around 85m deep). Final pit floor at completion of the current mine design is 870mRL in C3 pit and 1120mRL in C1 pit, with the final depth of the pit at 455m (Figures 17 and 18). The Kapanga final pit is 1012mRL, around 300m deep.

Current mining at Greenbushes is based on open pit extraction using conventional hydraulic excavators and haul trucks; mining is at a rate of approximately 4.5 million bank cubic meters per annum ("Mbcmpa"). The mining activities of load and haul are carried out by mining contractor, SG Mining Pty Ltd ("SGM"), and drill and blast activities are contracted to Action Drill and Blast Pty Ltd ("ADB"); Talison provides grade control and overall pit management.

The underground tantalum mine, accessed from an adit within the Cornwall pit, was placed on care and maintenance from 2005 until 2014 when the pumps were withdrawn. The southern limit of the former underground development extends beneath the central area of the C3 pit, and will be exposed in the LOM pit.

Mine planning is undertaken by Talison. Mine scheduling is done by Greenbushes' mining staff based on directions from Talison Corporate office and Talison's owners, setting the product volume and quality requirements each year.

# **Pit Optimisation and Designs**

The design of the Central Lode and Kapanga open pits which contain the hardrock lithium Ore Reserves is based on optimisation work undertaken by Talison using commercial inputs and processing criteria, and was reviewed by BDA in 2021. Several of the inputs are commercially sensitive but all parameters are in line with the current operations and cost structure. No dilution factor was applied to the grade and a mining recovery factor of 100% were assumed in the optimisation analysis. Whittle software based on the Lerch Grossman algorithm was used to create optimized pit shells from the Mineral Resource block model run in Surpac.

The geotechnical parameters used in the 2021 optimisation were drawn from recommendations from geotechnical consultant, PSM Consult Pty Ltd ("PSM"). Allowances for haul road segments were included in the design parameters. The designs are consistent with current operating practices for the Central Lode pits. Ramp width was set at 18m single lane and 26m for two-way traffic. Haul road gradient was set at 1:10 or approximately 6°. The final C3 pit floor is at 870mRL, with a high wall of approximately 455m; the final C1 pit floor is at 1120mRL, with a high wall of approximately 160m and the final Kapanga pit floor is at 1012mRL, with a high wall of approximately 300m. The east wall of Kapanga will require some of the Floyd's waste dump to be cut back to provide sufficient distance between the pit limit and the toe of the waste dump.

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**Tianqi Lithium Corporation** 

Greenbushes Lithium Operations

Figure 17 804 - 201 (03) November 2021

OPEN PIT RESERVE DESIGN Behre Dolbear Australia Pty Ltd

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The selected Whittle shells from the Ore Reserve optimisation modeling were used to design mineable pits that satisfied the design criteria of the site Slope Stability Management Plan, utilized parts of the existing ramps, minimized narrow mining widths and met the required bench mining widths. The final reserve pit has been designed with 20m bench heights, with 8 to 8.5m bench widths

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and overall wall angles between 37° and 44° in the west and between 25° and 34° in the east (Figures 17 and 18). Local batter angles vary with local ground conditions as summarized in Table 4.12.

The voids of the former underground development within the open pit design in the Central Lode have not been extracted from the reserve but the size is estimated to be around 200kt which is not material to the estimation.

There is no distinctive pit floor at C2 pit; the pit provides access into the C3 pit (refer Figure 7).

#### **Table 4.12**

Pit	Wall Orientation	Lithology	Maximum Batter Angle (Degrees)	Maximum Bench Height (meters)	Minimum Berm Width (meters)
C1	East	Weathered to Moderately Weathered	45	10	10.5
	West	Weathered to Moderately Weathered	45	10	10.5
	East	Pegmatite and Granofels	65	20	9.3
	West	Dolerite, Amphibolite and Pegmatite	70	20	8
	North and				
	South	Pegmatite/ Amphibolite	70	20	8
C3	N/E/W	Weathered Zone <30m	40	Single Batter	
	N/E/W	Weathered Zone>30 to <45m	40	20	11
	(Northern) East	Pegmatite and Granofels	55	20	8.5
	(Southern)	Pegmatite and Granofels	60	20	8.5
	West	Dolerite, Amphibolite and Pegmatite	75	20	8.5
	North	Pegmatite/ Amphibolite	70	20	8.5
Kapanga	N/S/E	Weathered Zone <30m	40	Single Batter	
	N/S/E East	Weathered Zone>30 to <50m	40	20	11
	(Northern) East	Pegmatite/ Amphibolite	50	20	8.5
	(Southern)	Pegmatite/ Amphibolite	55	20	8.5
	West	Amphibolite/ Granofels	75	20	8.5
	North and	-			
	South	Amphibolite/ Pegmatite	75	20	8.5

# Pit Wall Design Parameters for Ore Reserves Estimation

Note: N=north, S=south, E=east, W=west; there is no west wall weathered zone at Kapanga as it breaks into Central pit

# **Open Pit Cutbacks**

Talison has designed a series of cutbacks and the ultimate pit design using the optimisation data. The cutbacks are designed with minimum mining widths between 80 and 100m. The schedule of the volumes mined are shown in Figure 19 and volumes of the various cutbacks are shown in Table 4.13; further optimisation of the schedule may vary the timing of the various cutbacks shown. While the LOM cutback is relatively large, BDA anticipates that there may be opportunities to further stage the final pit cutback as the mine progresses.

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# **Table 4.13**

# **Open Pit Cut Backs (Mbcm)**

Cut Back	Commence	Complete	Volume (Mbcm)
C1 Stages 1 and 2	Ongoing	2037	7
C2 West	Ongoing	2022	1
C3 Central	Ongoing	2024	1
C3 East Stages 2	Ongoing	2027	4
C3 Calamari Stage 1 &2	2022	2034	37
Lemonade Springs	2023	2038	36
Kapanga	2023	2037	82
LOM	2024	EOML	145
Total	—	—	311

Note: EOML = end of mine life; Mbcm = million bank cubic meters; some rounding error in total

# Waste Dump

The Floyd's waste dump (Figure 4) was planned to be the depository of all waste rock from the Central Lode pit and is to be extended south, parallel to the highway to the east and south of the open pits. With the inclusion of the Kapanga pit in the reserve, further planning is required to determine the waste storage for the additional waste with the potential for some in-pit waste dumping. Further land acquisition and approvals would be required for any additional waste depositories. The details of the approvals are discussed in Section 4.8.

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# Geotechnical and Hydrological Aspects

The geotechnical parameters used in the 2021 optimisation were drawn from recommendations in various PSM reports and subsequent site design reviews. Allowances for haul road segments were

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included in the design parameters. The designs are consistent with current operating practices for the Central Lode pits.

The Cornwall pit which is adjacent and to the north of the C3 pit was mined to a depth of 270m between 1992 and 2003 using the same overall slope angles and its walls remain stable. The overall rock strength at Greenbushes is considered generally good with limited structural weaknesses; pit slope parameters have been refined to manage risk of failures over an extended period of mining. Some earlier batter failures have necessitated adjustments to bench heights and a number of other measures including a small quantity of meshing to ensure pit working areas are safe, although no recent meshing has been required. A recent annual geotechnical review in October 2020 by geotechnical consultants, PSM, concluded that the overall geotechnical performance was satisfactory and within expectations.

Talison uses a radar monitoring system to monitor movements on the C1 west pit wall which is planned to be further expanded; in addition continuous prism monitoring theodolites with plans to four or five systems provide further important components of pit wall monitoring, particularly for C3 pit when the mining operation significantly increases in production rate as well as pit size, as envisaged in the LOM schedule.

A geotechnical drilling program was carried out on the west wall of C3 pit during 2015/16 and the data reviewed by geotechnical consultants who have confirmed design parameters. Some further drilling in 2018 has improved geotechnical knowledge and included the limiting of a fault zone that proved to be not as significant as initially thought. Further geotechnical assessment has been carried out since 2018 with 13 geotechnical drill holes into the Kapanga area and a further six geotechnical holes in the C1 east wall to provide assessment of design pit slopes for the extensions of the pit reserves.

As the pit depth increases Talison is increasing its knowledge of the hydrological conditions. A network of vibrating wire piezometers ("VWP") has been constructed with 15 VWPs hosted in 9 boreholes; monitoring depths ranges from 50m to 370m within the pit area. Hydrological modeling has been carried out by PSM. The work has shown that there is generally low to low/medium hydrological risk within the pit but PSM has noted that more data needs to be collected including the monitoring of abstraction rates from in-pit sumps and the estimation of groundwater inflow contributions to these rates

Based on the larger rainfall catchment area as the 'footprint' approaches the final pit design, additional pit pumping capacity may be required. Talison has drilled a 200m hole from close to the pit floor in C3 into the underground mine, allowing drainage of the pit floor. The underground workings can now be pumped when required. Prior to the installation of the drain hole, around 12 liters per second ("L/s") of water was pumped from the pit; it is estimated that groundwater ingress into the Cornwall pit and underground workings is approximately 25L/s. The operating levels are rarely affected by high rainfall events. Once the pit floor reaches the old workings an alternate approach will be required for dewatering C3 pit.

There is a relatively low occurrence of seismic activity in the southwest of WA. The Australian Geological database from 1955 shows that the maximum recorded earthquake within 200km was a magnitude 5.4 in 1969, 200km north-northeast of Greenbushes. There is no evidence of seismic activity having any material impact on pit slope stability at Greenbushes.

# **Grade Control**

For grade control purposes, Talison drills 133mm diameter RC holes on a 10 x 15m pattern to a length of 15m vertically with 2.5m samples taken. A local block model is then developed for lithium grades and proxy iron values to guide short term mine planning; the proxy iron values are based on a formula developed from local experience. Final definition of ore blocks and differentiation of ore types is based on grab samples from blast hole drilling on a spacing of approximately 2.5m x 3m. Duplicate RC and grab samples are collected at a ratio of approximately 1:20 and submitted for analysis for QA/QC purposes.

Ore outlines are based on interpretation of blocks above the  $Li_2O$  cut-off grade, which, for Ore Reserves, is presently set at 0.7%  $Li_2O$ , taking account of practical mining limitations, with TG blocks being identified from >3.5%  $Li_2O$  cut-off and with low proxy iron values. Predicted mining tons and grade are calculated using Surpac software.

#### **Mining Operations**

The open pit operation uses conventional mining methods with drilling and blasting of both ore and waste; the contractor is currently using a Gardner Denver GD5000 drill and an Atlas Copco D65 which can drill both blastholes and RC holes for grade control. Within ore, the blast hole drill pattern is either 2.3 x 2.7m or 2.5 x 2.9m for 5m benches with nominal 115mm diameter blast holes. Within the greenstone waste the drill pattern is 4.1 x 4.8m for 10m benches with nominal 127-165mm diameter blast holes. Emulsion explosives are used for blasting.

The load and haul fleet consists of four 125/140t hydraulic excavators, fifteen 100t dump trucks, four blast hole drill rigs and 18 ancillary items of plant including loaders. Ore is taken to the ROM pad where it is stockpiled according to ore type, mineralogical characteristics and grade. Tantalum mineralisation mined as a consequence of lithium mining is stockpiled separately. Waste is trucked to the Floyd waste dump to the east of the pits; currently road access to the dump is from the northeast corner of C3 pit and from the south from C1 pit. Total material movement is around 4.3Mbcmpa and the schedule and costs recognize the annual haulage distances required.

SGM took over the mining contract in 2009 and to date has met the requirements of the contract. The contract was to expire in June 2019 but agreement was made to extend the contract to early 2023. This revised contract date was planned to coincide with the establishment of the new Mining Services Area ("MSA") to the north of the Central pit mining area and the steep increase in annual mining volumes. Talison has indicated that a new contract is planned to be put out for tender in 2022 and the contract to commence in early 2023.

The MSA is planned to provide new suitably sized, equipped and fit for purpose facilities including heavy haulage workshop, drill and blast workshop, technical services offices and diesel tankage. The MSA will replace the current workshops and facilities which are situated on the north wall (ramp) cutback which commences in 2023.

The contractor currently operates two twelve hour shifts per day, seven days per week, to achieve the current production rate. Planned movement in 2022 is 5.5Mbcmpa, which is about 90% of the 2021 rate. In 2023, the production rate is scheduled to increase to around 15.7Mbcmpa, further increasing to 27.7Mbcmpa by 2025. The new mining contract will have a mining fleet of 45 140t dump trucks, six 260t excavators, 16 blast hole drill rigs and a likely ancillary fleet of 20. Figure 19 shows the scheduled material mined from 2022 for the LOM.

Mining vertical advance assumed in the mine schedule by Talison is limited to three benches per year on the various cutbacks, which BDA considers is appropriate.

The mine management, including geological staff, has appropriate experience at Greenbushes Mine. Personnel numbers are relatively low, which is typical of a mining operation such as Greenbushes Mine with contract mining. Talison uses external consultants to assist the operation when required. The increase in mining volumes will require additional labor resources and while the operation has had sufficient local labor in the past to meet requirements there is potential for some short term labor shortage during the ramp up of the mine production.

# **Conclusions**

Mining operations are well established and mine designs are appropriate and have taken into account geotechnical recommendations. Planned mining rates are reasonable and considered to be achievable with the larger fleet under a new contract. Planned mining recovery of 100% with resource block grades at 100% appears reasonably in line with recent reconciliation results; BDA considers these parameters provide an acceptable basis for future planning but further review of dilution at Kapanga where ore zones are smaller than the Central Lode is recommended.

The general geotechnical conditions are good. Localized batter failures have been managed without any impact on the overall Ore Reserves. The current work program of the geotechnical consultant is aimed towards ensuring the final wall is designed appropriately.

The mine contractor has been operating on site since 2009 and has met the requirements of the contract; the fleet has been updated and increases to mine production are being achieved, but there will be significant increases in requirements as the mining volumes increase. The plan to adjust mining fleets through changes to the mining contract is considered appropriate and provides the required flexibility.

# 4.6 Processing

# Introduction

The Greenbushes processing operations have been treating lithium ores for over 30 years. The metallurgical process required to produce concentrates from Greenbushes spodumene ore is well understood. Metallurgical test work is undertaken on a routine basis for the purposes of continued optimisation and improvement, with specific objectives that include improving the knowledge of ore characteristics, assessing and optimizing the process performance, assessing circuit changes and evaluation of new equipment and technologies. The majority of such test work can be carried out in the operating plant to provide a direct real measure of performance. Where necessary, either the Greenbushes laboratory or outside laboratories or supplier facilities are also used.

Talison personnel have developed a model to predict the iron content of the lithium concentrate that would be produced from a particular ore block. The model has been extensively tested against plant performance and is considered to be reliable.

Routine test work on core and drill cuttings is not carried out, as the application of the iron grade predictive model to analyzes obtained from core and drill cuttings provides a more comprehensive and reliable method for assessment of plant feed type. However, iron analyzes of

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spodumene grains from drill core samples are conducted by microprobe to determine the metallurgical characteristics of future ores. These analyzes are used to confirm the reliability of the iron grade predictive model on the ore stream in the mine plan.

# **Greenbushes Lithium Plant Operations**

The three lithium mineral processing plants currently operating, CGP1, CGP2 and the TGP, are located adjacent to the open pits (Figure 4). For the calendar year 2021, CGP1 processed around 1.83Mt of ore, CGP 2 processed around 1.39Mt whilst the TGP processed around 0.35Mt, with total production of technical and chemical grade concentrates being 954kt. This level of concentrate production is scheduled to increase further as the CGP2 plant ramps up with the three plants achieving full capacity in 2023.

The lithium recovery process for the chemical grade plants and for the TGP includes:

- crushing and ball milling to reduce the size of coarse ore
- heavy media separation ("HMS"), to separate lithium minerals from lower density minerals; HMS at Greenbushes uses a slurry of fine ferrosilicon suspended in water
- classification, to separate a stream into several size fractions using screens or a hydraulic sizing method
- wet high intensity magnetic separation ("WHIMS"), to remove minerals which have the potential to contaminate concentrates with iron
- regrind ball milling, to grind the ore stream finer, improving the liberation of the contained minerals, so that a physical separation can be made
- flotation, to separate lithium minerals from gangue minerals
- thickening, to increase the pulp density of the tailings and concentrate, and to produce clean water for recirculation as the process water supply
- filtration, to dewater the concentrate to a suitable level for shipment.

The processing route, involving heavy medium separation and flotation, is analogous to that generally used in coal processing, and analysis of the plant performance is generally carried out in a similar manner to the way in which coal processing is assessed, with the mass yield to concentrate being the critical variable.

Talison defines yield as the percentage of the feed to a plant which reports to the concentrate. In 2021, TGP, CGP1 and CGP2 yields were 43.5%, 31.1% and 16.5% respectively. The higher yield from the TGP plant is largely due to the higher spodumene content, and hence higher lithium grade (pure spodumene grades 8.1% Li<sub>2</sub>O), and the lower iron grade of the ore fed to that plant, rather than from any significant difference in the processing route. Yields in CGP2 reflect the lower grades of ore currently fed to the plant and the ramp up stage of the plant. The CGP1 plant has been operating reasonably well, equal to or even above the theoretical yield curve.

The CGP2 plant ramp up is scheduled to be completed at the end of 2022. However, plant throughput of 307 tonnes per hour ("tph"), which is in line with design throughput, has already been achieved for 2021 and has continued for January 2022. Product grades averaged 5.9%  $Li_2O$  in 2021 but more recently in January 2022 product grades of 6.0%  $Li_2O$  have been achieved. The average recovery

for CGP2 for 2021 was reported at 50.5% with yield at 16.5% at a plant feed grade of 2.0% Li<sub>2</sub>O. The forecast yield for 2022 is 15.8% in January, progressively increasing to 21.8% by December. The head grade to CGP2 for 2022 is budgeted at 1.8% Li<sub>2</sub>O, remaining at this level in the 5-year plan. Talison advises that the yield ramp up will be a particular focus during 2022. Several plant investigations have been initiated including optimisation of various plant circuits including high pressure grinding roll performance, WHIMS magnetic separation, classification, and flotation as well as tracking hour-by-hour plant feed variations. Other variables being investigation is plant utilisation. BDA notes that with a large and complex plant, the optimisation of metallurgical performance is dependent on steady-state operation and any unplanned shutdowns can severely impact on performance. Site personnel are working to reduce the number of unplanned shutdowns to assist in the optimisation of metallurgical performance.

Talison plans to increase production of chemical grade concentrate by bringing three additional plants (CGP3 and 4 and TRP) into production. The flowsheets for the two CG plants will be similar to that of CGP1 and 2, although the new plants will be configured to process lower grade ore than CGP1, more in line with CGP2 feed grades. The decision to construct CGP3 has been announced and geotechnical assessment of the site, next to the CGP2 plant, is underway and engineering designs are well advanced. CGP3 will be capable of increasing the annual output of chemical-grade lithium concentrate by approximately 520,000t when fully constructed and operational. Lycopodium Ltd has been awarded the EPCM contract; first production is planned in 2025. The proposed CGP4 plant, which is planned to be similar to CGP3, is planned to begin construction in 2025 and to be in operation in 2027. The throughput capacity of the new plants will be the same as CGP2 at 2.4Mtpa of ore.

The TRP construction was completed in the first quarter of 2022 with commissioning now underway. This plant will process tailings from previous tantalum ore processing operations which will be reclaimed from TSF1 at a rate of around 2Mtpa. Testwork has shown that this tailings material contains sufficient recoverable lithium to justify a treatment operation and the treatment process also makes possible the re-use of some of the capacity of TSF1. The treatment process includes scrubbing, attrition and desliming to remove clayey fines, magnetic separation to remove iron, flotation of the non-magnetic stream, and filtration of the final concentrate. This is essentially the same process as that used in the primary treatment plants, without the heavy medium separation stage.

The three existing plants, the TGP and CGP1 and 2, produce lithium concentrates with a range of lithium and iron grades as shown in Table 4.14. Chemical grade concentrates from the new plants are planned to be of a similar grade to the concentrate from CGP1 and 2.

Spodumene concentrate SC6.0 is a chemical grade concentrate with a minimum grade of 6% Li<sub>2</sub>O and relatively high iron content, produced from CGP1 and 2. The remaining four concentrates (SC5.0, 6.5, 6.8 and 7.2 Standard and Premium) are produced from the TGP and have significantly lower iron levels.

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#### **Table 4.14**

# Specifications of Talison Lithium Concentrates—Chemical Grade (CG) and Technical Grade (TG)

Item	SC5.0	(TG)	SC6.	0 (CG)	SC6.5	5 (TG)	SC6.8	8 (TG)	SC7.2	S (TG)	SC7.2	P (TG)
% Li <sub>2</sub> O	5.0	Min	6.0	Min	6.5	Min	6.8	Min	7.2	Min	7.2	Min
% Fe <sub>2</sub> O <sub>3</sub>	0.13	Max	1.0	Max	0.25	Max	0.20	Max	0.17	Max	0.12	Max

Note: SC is spodumene concentrate; numerals in product name indicate guaranteed Li<sub>2</sub>O level; Max is maximum level; Min is minimum level; S=standard; P=premium

The relatively low grades of the lithium concentrates reflect the generally low lithium content of lithium minerals. Pure spodumene contains 8% Li<sub>2</sub>O, about twice the grade of other significant lithium minerals which are exploited on a commercial basis. Talison's SC7.2S and 7.2P concentrates are premium high-grade concentrates containing around 90% spodumene and are produced in the TGP.

In the past, processed Greenbushes lithium ore has contained around 4% Li<sub>2</sub>O, equivalent to around 50% spodumene. Processed CG ore grade is forecast to fall over the next few years to an average of around 2% Li<sub>2</sub>O from 2026 onwards. The mineral suite in the ore includes spodumene (lithium aluminum silicate), quartz, sodium and potassium feldspars, micas (muscovite, biotite and lepidolite), phosphates (apatite, amblygonite and lithiophilite), minor carbonates, tantalum minerals, cassiterite (tin oxide) and arsenic minerals.

The pegmatite ore processed at Greenbushes is generally very predictable and Talison staff assess processing characteristics and future product quality from comprehensive chemical analysis of the ore. Whilst the ore is relatively abrasive, designs which control wear rates to acceptable levels have been developed in high-wear areas such as chutes in the crushing and grinding circuits.

Laboratory-scale testwork on ore samples is generally only carried out when potential improvements to the process, such as alternative flotation reagents, are being evaluated. Talison has found that the processing characteristics of the Central Lode pegmatite ore can be determined accurately from the comprehensive chemical analysis which is carried out on ore samples. This methodology has proven to be very successful on the ore mined to date and the ore reserve planned to be mined is known to be mineralogically very similar, though of lower lithium grade.

Talison considers that the lower grade ores to be mined in future years are generally similar in their mineralogical characteristics to the tailings material on which testwork has been carried out and which is planned to be reprocessed. BDA has discussed the methodology used to predict process plant performance with Talison staff and considers that in this case it is appropriate to use the chemical assays carried out on the drill core samples to predict metallurgical performance. Experience to date on site has indicated that the risk involved is low.

# **Crushing Plant Operations**

The crushing plant, CR1, is used to feed CGP1 and the TGP. This plant has been the crushing plant for lithium ore until 2018 when there was a hiatus for a period when hire crushing was used. The CR1 plant is now again fully operational. The CGP2 plant is fed from crushing plant CR2 with a capacity of around 500tph. The planned CGP3 plant will be fed from a new crusher plant, CR3, with a planned capacity of 500tph.

# General

The three operational lithium plants include gravity separation stages comprised of shaking tables and/or spirals for recovery of tantalum. The tantalum concentrate is transferred to GAM.

Tailings are discharged to the TSF without the need for any neutralization process. Chemical addition to the plant is restricted to minor amounts of flotation reagents and flocculants for use in the thickening processes. Other consumables include crusher and ball mill liners, ball mill media, and ferrosilicon for use in the HMS plants.

Talison has advised that levels of spare parts holdings are assessed as part of a critical continuity plan which is an insurance requirement. Major spares holdings include mill motors, girth gears and pinion shafts for the ball mills and a spare gear box and girth gear for the WHIMS. Other spares holdings include screen panels, flotation machine agitators, pump liners, filter belts and conveyor belts. The location of the operation, within three hours driving time from Perth, ensures that a wide range of spare parts is available at short notice.

# Conclusions

Talison plans to increase ore processing capacity at the Greenbushes site to around 9.5Mtpa by construction of two additional chemical grade plants. When the operation ramps up to full capacity, currently scheduled to occur in 2028, the operation will produce around 2.2Mtpa of lithium concentrate.

CGP3 is planned on a site adjacent to the existing CGP2 and engineering design is progressing. Scoping studies have been completed for CGP4. The two new CG plants will use similar flowsheets to that of the existing CGP2.

The TRP plant construction was completed in the first quarter of 2022 and uses a flowsheet similar to the fines end of the existing plants. The ramp up to full production late in 2022 should be relatively straightforward.

Talison has developed significant expertise in managing production of a range of lithium concentrates and has been active in utilizing new technology to improve the performance of the two existing plants. BDA considers that the planned expansion of the ore processing area is practical and achievable at low risk and notes that it consists largely of replication of existing facilities.

# 4.7 Infrastructure

# General

Access to the Greenbushes mine is via the sealed South Western Highway between Bunbury and Bridgetown to Greenbushes Township and via Maranup Ford Road to the Greenbushes mine site.

Existing infrastructure on site includes power and water supply facilities, a laboratory, administrative offices, occupational health/safety/training offices, dedicated mines rescue area, stores, storage sheds, workshops and engineering offices.

# Water Supply

Water for mineral processing is sourced from rainfall and stored in several process water dams located on site, with the majority of the water used being recovered and recycled. Surface water quality is measured and reported on a monthly basis.

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Process water supply facilities for CGP2 have been established from the clear water pond including new pumps, piping and a dedicated power supply. At this stage some temporary shortfalls of available water for the CGP3 and CGP4 plants in 2025 are anticipated. Talison has advised that further water harvesting, possibly on the eastern side of the lease around the Floyd waste dump, is being considered with funds in the capital forecast in 2022 for investigations to expand water storage capacity by an extra 50%.

Talison has recently completed construction of a Water Treatment Plant ("WTP") to reduce dissolved lithium and improve water quality in the mine water circuit and discharge waters.

# **Power Supply**

Talison purchases its power from Alinta Energy; power is delivered by Western Power's distribution system and reticulated and metered within the site by Talison. Power for CGP2 is supplied from an existing 22 kilovolts ("kV") switchboard via a new circuit breaker. Merz Consulting has been awarded the engineering, procurement and management ("EPC") contract for the project to upgrade the power supply facilities including installation of a 132kV power line to provide additional power from the local grid for the further expansion. The project is scheduled for completion in Q2 2023.

# Workforce Accommodation

A 250 room accommodation camp was established for the CGP2 construction workforce. The camp was initially established by the engineering contractor but was handed over to Talison at the end of 2019. The camp is planned to be maintained for the construction workforce for CGP3 and CGP4.

Talison has a policy that all employees must live within 30 minutes' drive of the site.

#### **Expansion Infrastructure**

With the construction of CGP2 and the increased production, Talison completed a number of infrastructure developments including:

- a storage shed and associated materials handling facilities, known as the Berth 8-8 Shed, at the port of Bunbury
- the water treatment plant at the mine site

Other infrastructure proposed to be expanded in the period 2022 to 2023 includes:

- the warehouse and workshop
- the laboratory
- new access road to avoid the Greenbushes town.

# Conclusions

The existing and proposed infrastructure is generally adequate and appropriate to support the existing operations and the proposed expansion of TRP, CGP3 and CGP4, although further planning and investigations are required to ensure the future water demand for CGP3 and CGP4 is met.

# 4.8 Mineral Tenements, Royalties and Regulatory Approvals

# **Mineral Tenure**

BDA has not undertaken legal due diligence on the status of the mineral tenements. The following tenement details (Table 4.15 and Figure 20) are based on information provided by Talison at the end of 2021. The mineral tenements are held and controlled by Talison.

# **Table 4.15**

#### Tenement **Grant Date Expiry Date** Area (ha) L01/01 ..... 19-Mar-1986 27-Dec-2026 9 M01/02 28-Dec-1984 27-Dec-2026 969 M01/03 ..... 28-Dec-1984 27-Dec-2026 1000M01/04 ..... 28-Dec-1984 27-Dec-2026 999 999 M01/05 ..... 28-Dec-1984 27-Dec-2026 M01/06 ..... 985 28-Dec-1984 27-Dec-2026 M01/07 ..... 28-Dec-1984 27-Dec-2026 998 M01/08 ..... 28-Dec-1984 27-Dec-2026 999 M01/09 ..... 28-Dec-1984 27-Dec-2026 997 M01/10 .... 28-Dec-1984 27-Dec-2026 1000 M01/11 ..... 28-Dec-1984 27-Dec-2026 999 M01/16 ..... 06-Jun-1986 05-Jun-2028 18 M01/18 ..... 28-Sep-1994 27-Sep-2036 3 05-Jun-2028 10 05-Jun-2028 10 M70/765 ..... 20-Jun-1994 19-Jun-2036 70.4 07-Mar-2026

#### List of Mineral Tenements held and/or Controlled by Talison<sup>4</sup>

Note: G01/01 and G01/02 are linked to Mining Lease M01/16 and are General Purpose Leases; "G" denotes General Purpose Lease; "L" denotes Miscellaneous License, "M" denotes Mining Lease, "E" denotes Exploration License; under the Western Australian Mining Act 1978, the term of a mining lease may be renewed for further terms; a renewal of term (Form 9) can be lodged during the final year of the initial 21 year term on any mining lease and for further periods of 21 years; \*— the exploration license covers an area of two blocks (one block = one graticule which is one minute of latitude by one minute of longitude); Talison has an application pending for a prospecting license P01/2 which lies within M01/02

Approximately 55% of the tenement area is covered by State Forest which is under the authority of the Department of Biodiversity, Conservation and Attractions (DBCA). The majority of the remaining area is private land (representing approximately 40% of the surface area), and the balance comprises Crown Land, road reserves and other miscellaneous reserves.

<sup>&</sup>lt;sup>4</sup> The list of Mineral Tenements was as of December 31, 2021.

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Figure 20	TENEMENT PLAN
BDA - 201 (03) November 2021	Behre Dolbear Australia Pty Lt

The tenements cover a total area of approximately 10,000ha and include the historic Greenbushes tin, tantalum and current lithium mining areas. The operating lithium mining and processing plant area covers approximately 2,000ha comprising Mining Leases M01/06, M01/07 and

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M01/16. These three leases contain the entire lithium Measured, Indicated and Inferred Mineral Resource. All lithium mining activities, including tailings storage, processing plant operations, open pits and waste rock dumps, are currently carried out within the boundaries of Mining Leases M01/06, M01/07 and M01/16 plus General Purpose Leases G01/01 and G01/02. Note, there is a sublease agreement between Talison and GAM who owns the rights to non-lithium minerals on the tenements.

In order to keep the granted tenements in good standing, Talison is required to spend a yearly minimum of A\$1.02 million ("M") for all the permits. Annual rates of approximately A\$69,000 and rent of approximately A\$162,000 are also payable to the Shires of Bridgetown-Greenbushes and Donnybrook-Balingup, and the WA Department of Mines and Petroleum, respectively. A condition of grant of a mining lease is the contribution of an annual levy to the new statutory Mining Rehabilitation Fund ("MRF") under the Mining Rehabilitation Fund Act 2012; ("MRF Act") this annual levy replaces the previous lodging of an environmental bond. Participation in the MRF was made compulsory from July 1, 2014. On July 1, 2014 the pre-existing bonds were released back to Talison in their entirety and the annual MRF financial contribution, totalling A\$281,402 in 2017 which is related to the area of land disturbance, was made to the MRF; pursuant to the MRF Act, Talison is required to make this contribution to MRF annually. The legal onus on tenement holders for mine rehabilitation and mine closure is not altered by implementation of this annual MRF levy.

# **Mining Rehabilitation Fund**

The Mining Rehabilitation Fund is a pooled fund that is to be used to rehabilitate abandoned mine sites in the State of Western Australia. Interest earned on fund contributions will be able to be spent on the rehabilitation of legacy abandoned mines. The Mining Rehabilitation Fund Act 2012 (MRF Act), which provides the framework for the MRF, was enacted in 2012. All tenement holders operating on Mining Act 1978 tenure (with the exception of tenements covered by State Agreements not listed in the regulations), are required to report disturbance data and contribute annually to the fund. Tenements with a rehabilitation liability estimate below A\$50,000 will report disturbance data but will not be required to contribute to the fund. As the MRF is a special purpose account under the Financial Management Act 2006, funds must be spent in accordance with the purpose stated in the MRF legislation.

# **Royalties**

In Western Australia, a royalty of 5% of the royalty value of concentrate sales is payable for lithium mineral production as prescribed under the Mining Act 1978 (WA). The royalty value is the difference between the gross invoice value of the sale and the allowable deductions on the sale. The gross invoice value of the sale is the Australian dollar value obtained by multiplying the amount of the mineral sold by the price of the mineral as shown in the invoice. Allowable deductions are any costs in Australian dollars incurred for transport of the mineral quantity by the seller after the shipment date. For minerals exported from Australia, the shipment date is deemed to be the date on which the ship or aircraft transporting the minerals first leaves port in WA.

Talison has advised BDA that no private royalties apply to the Greenbushes property.

# **Regulatory Approvals**

Mining and mineral processing activities at the Greenbushes lithium project operate under a number of State government approvals and approved variations under the WA Environmental Protection Act 1986 (WA) ("Environmental Protection Act") and Mining Act 1978 (WA) ("Mining Act").

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The mining Notice of Intent ("NOI") dated April 1991 (Gwalia Consolidated, 1991) is the main development approval which provides for current lithium and tantalum production activities at Greenbushes. A subsequent mining NOI dated August 2000 (Department of Minerals and Energy, 2000) was approved for underground mining on Mining Lease M01/06.

In April 2014 Talison submitted a revised Mining Proposal covering the continuation of hard rock mining at Greenbushes from 2014 to 2035 for both the lithium and tantalum businesses which was approved by the DMP on April 23, 2014. The proposal was based on a 22 year mine life from current lithium Ore Reserves taking into account plant expansion to 3.3Mtpa.

In August 2019 Talison received Ministerial Approval No. 1111 to undertake Stage 3 and Stage 4 expansion of the existing Greenbushes Lithium Mine. This approval includes the following changes;

- developing an expanded open pit
- establishment of two additional chemical grade processing plants, a plant for treatment of tailings, an additional crusher and expansion of a centralized ROM
- establishment of a new Mine Services Area (MSA) and explosives storage and handling infrastructure
- expansion of the existing Floyds waste rock dump
- construction of an additional Tailings Storage Facility (TSF4)
- establishment of additional linear infrastructure corridors (bypass road, powerline, pipeline and road corridors).

Various Works Approvals under the Environmental Protection Act 1986 have also been granted over time to provide for various process plant upgrades. Greenbushes also operates under Environment Protection Licenses Nos. L4247/1991/13 (Talison) and L8501/2010/2 (GAM) which were issued by the Department of Environment and Conservation ("DEC") under the Environmental Protection Act. A list of the more recent Mining Proposals since 2005 which were previously termed Works Approvals is provided in Table 4.16.

Talison has achieved accreditation by Bureau Veritas for International Standards ISO 9001:2015 Quality Management System Requirements and ISO 14001:2015 Environmental Management System Requirements.

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#### **Table 4.16**

# **Regulatory Approvals Since 2005**

Year	Regulatory Approvals
2005	Greenbushes Tailings New Cell Approval October 2005
2006	Greenbushes Tailings Facility at 3Cs Approval April 2006
2008	Greenbushes Lithium Mineral Plant Upgrade Approval May 2008
2011	Works Approval 4927-2011-1 DEC Project 640 Aug 1 2011
	REG ID 30733 UPB LETTER_20110624104326_DMP
2014	Greenbushes Operation 2013_Mining Proposal ID 45382
2016	Greenbushes Tailings Storage Facility Expansion 2015, Mining Proposal ID 56542
2016	Greenbushes Operations Expansion of Mine Waste Rock Dump Commonwealth EPBC Act 2013/6904
2019	Greenbushes Lithium Mine Stage 3 and Stage 4 Expansion Ministerial Statement No. 11August 11, 2019
Pending:	
2022	Greenbushes 'Ten Year' Mining Proposal (planned for Q1 2022) submission to DMIRS

Note: DEC Operating Licenses are now issued by Department of Water and Environmental Regulation (DER)

# **Mining Proposal**

The Mining Proposal is required to detail all matters relating to the environmental management of the proposed project as set out in the DEC's environmental approval guidelines. The Mining Proposal must provide a detailed description of both the proposed project and the existing environment in which it will take place. Besides the natural environment, the description should include relevant aspects of the social environment such as Aboriginal sites, heritage issues, community values and other existing land uses. Using this information, the Mining Proposal must then assess the environmental impacts arising from the project, determine which are likely to be significant, and then present the environmental management commitments the company will undertake to manage and ameliorate all these significant effects.

At present, a "10-year" Mining Proposal is being prepared, so as to align with the current capacity of the Floyds Waste Dump. Submission of this Mining Proposal is planned to occur in Q1 2022.

# **Other Regulatory Approvals and Licenses**

In addition to the DMP's written approval to commence mining under the Mining Act, other statutory environmental approvals or licenses may also be required by other Government agencies. For example, Talison operates under various Permit to Clear Native Vegetation and a DEC Operating License No. L4247/1991/11 (Talison) which are issued by the WA Department of Environment and Conservation.

Talison received Commonwealth Environment Protection and Biodiversity Conservation Act approval (Referral 2013/6904) for the Greenbushes expansion of mine waste dump in November 2016.

Talison currently operates under a WA Department of Environment Regulation License (No. L4247/1991/13. This license was last amended in May 2017 and includes several improvement requirements to be completed as part of the license amendment in July 2016 to raise the embankment for TSF 2 to RL1,280m. An amendment to this licence is to be sought in Q1 2022 to facilitate commissioning and operating of the Tailings Retreatment Plant (TRP).

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Talison has an approved Mine Closure Plan in-place, "Talison Lithium Australia Pty Ltd - Greenbushes Operations Mine Closure Plan 2016" approved by Department of Mines and Petroleum (DMP). An updated Mine Closure Plan is currently being prepared by Talison for submission to the regulating authority in Q1 2022.

# Chemical Grade Plant CGP3 and CGP4 Expansion Approvals

Ministerial Approval No. 1111 granted in August 2019 enables Talison to develop the Stage 3 and Stage 4 expansion of the existing Greenbushes Lithium Mine which includes the establishment of two additional chemical grade processing plants, a plant for treatment of tailings, an additional crusher and expansion of a centralized ROM.

Talison will require operations approvals for the proposed Chemical Grade Lithium Production Plant (CGP3 and CGP4) expansion. These approvals will be similar to those applied for and received for the CGP 2 expansion.

# **Tailings Storage Facility (TSF4) Approval**

The TSF4 project, although ready for execution, was delayed concerning insufficient supporting information being raised as an issue by the regulating agencies (Department of Water and Environment Regulation ("DWER") and Department of Mines, Industry Regulation and Safety). Regulatory approval of TSF4 is now anticipated in Q1 2022, with the TSF4 design modified to include a clay lined floor of the whole TSF4 footprint to meet the regulator's hydrogeological concerns.

# Kapanga Pit Development

The latest Ore Reserve, August 2021, includes the development of the Kapanga open pit. This development will require the design of additional waste and tailings storage as the capacities of the current planned storages will be exceeded under the new LOM plan. Talison will require further statutory approvals for any new waste or tailings storage facilities.

# **Conclusions**

BDA has not undertaken a title search or legal due diligence on the status of the tenements or regulatory approvals held by Talison. Talison has advised BDA that there are no material tenement issues relating to title to any of Greenbushes' assets.

BDA has completed a review of tenements and approvals. The approvals process for gaining variations to the original development approvals at Greenbushes appears relatively straightforward and all necessary approvals appear valid and appropriate for the operations. BDA can foresee no reason why any future development approval applications or variations would not be forthcoming.

Talison has engaged consulting firm GHD to support the company in gaining the necessary environmental approvals required for expansion of the Greenbushes Lithium Mine.

# 4.9 Environmental and Community

BDA has reviewed those environmental aspects and social/community issues which are considered a material part of the project and which may have significant implications for the ongoing
viability of the operation. The issues discussed below cover the main environmental and social risk areas identified from BDA's review of the project's documentation and site visit to the Greenbushes project area.

#### **Biophysical Setting**

The Greenbushes site is situated at approximately 300m above mean sea level ("AMSL") (or 1300mRL). The operations area lies on the Darling Plateau and is dominated by a broad ridgeline which runs from the Greenbushes township (310m AMSL) towards the southeast (270m AMSL) with the open pits located along this ridgeline (300m AMSL). The current operating waste rock dump is located on an east facing hill slope which descends to 266m AMSL and adjoins the South Western Highway, whilst the process plant area is located on the west facing hill slope which descends to 245m AMSL. The tailings storage areas are located south of the mining and plant areas at 265m AMSL.

The Greenbushes area has a temperate Mediterranean climate, with distinct summer and winter seasons. The mean minimum temperatures range from 4°C to 12°C, whilst the mean maximum temperatures range from 16°C to 30°C. The hottest month is January (mean maximum temperature 30°C), whilst the coldest month is August (mean minimum temperature 4°C). There is a distinct rainfall pattern, with most of the rain occurring between May and October. The area averages about 970mm per annum with a range of about 610mm to 1,680mm. The evaporation rate for the area is calculated at approximately 1,190mm per annum.

The area is surrounded by vegetation broadly described as open jarrah/marri forest with a comparatively open understorey. Mining and processing operations at Greenbushes operate throughout the year.

## **Environmental Liabilities**

#### Mine Closure Cost

Talison's Greenbushes mining leases cover State Forest (administered by DBCA) and privately owned land. Mining in the area has been carried out for over 100 years leaving a legacy of areas that current operators are required to rehabilitate. Rehabilitation programs for historical and inactive mining sites are being managed with the assistance of local regulators. Relinquishment of rehabilitation liability criteria have been established with regulators and require that Talison re-establishes a selfsustaining native forest whilst maintaining recreation, conservation, landscape and hydrology objectives.

In 2015 Talison submitted a revised Mine Closure Plan to the DMP which was approved in February 2017. On the basis of this plan, the closure (rehabilitation liability) cost estimate for 2016 has been estimated at A\$32.1M (Talison 82%, GAM 18%) based on the current disturbed areas totalling 1,590ha covering infrastructure areas, tailings storage facilities, overburden and waste rock dumps and open pits. This estimated closure cost does not include the expected estimated asset recovery value of around A\$4M.

Talison is currently compiling an updated Mine Closure Plan which is planned to be submitted to DMIRS (the regulating authority) in Q1 2022.

#### Land Disturbance

The active mine site area has been highly disturbed by over 100 years of mining and forestry activity. The mining tenement conditions define the area as "totally disturbed by mining" by reference to an agreed map. The ongoing mine development is contained within this envelope, except for 28.82ha of remnant vegetation being in Good to Very Good condition that is required to be cleared for the expansion of Floyds waste dump. The clearing of this remnant vegetation enables the storage of waste on the nearby disturbed areas to be maximized, thus reducing the need for further clearing.

Under the current Mining Proposal, ongoing mine development which entails changes in mine pit development and waste dump expansion compared to the earlier land disturbance includes 130.7ha of current operational areas being used for alternate purposes, re-disturbance of 36.4ha of previously rehabilitated land, 52.7ha of land previously disturbed by mining (as per tenement condition #9) but currently not utilized and 31.5ha of forest that require compensation to be paid to DBCA (as per tenement condition #9).

#### Waste Rock Storage

The site's main waste rock dump is located east of the open pits (Figure 4) and is an approved facility. Under a recent approval Talison has commenced three 10m lifts to the existing Floyd waste dump which will provide a further 11Mbcm storage.

The Floyds dump was to reach the current approved extent in 2014. A development plan for the ongoing expansion of this dump has been produced which involves a further 30m vertical height on the current footprint plus an extension to the south (Figure 4) through an area that has predominately been disturbed by previous mining activity. The projected LOM volume of waste rock will require approximately an 85ha extension to the dump, which requires the disturbance of up to 75.2ha of remnant and regrowth vegetation over the next 11 years. This will require approval for clearing and access to DBCA land, however a large portion of this area has previously been disturbed by mining. A Mining Proposal for the proposed plant expansions to cover both the increased height on the existing dump and the waste rock dump extension of 85ha has been submitted and approved.

## **Tailing Storage Facilities**

Tailings are stored on site in tailings storage facilities TSF1, TSF2 and TSF3 (Figure 4). These three TSFs are located to the south of the plant with subaerial deposition from the peripheral embankments; water released from the tailings is returned to the plant through a centrally located pump-out decant. A fourth tailings storage facility TSF4 is planned with construction targeted to commence in Q1 2022.

TSF construction has been carried out under a mining approval and in accordance with DMP guidelines.

TSF1 remains inactive and there are no plans for it to be reinstated at present, a covering of grassy weeds ensures that TSF1 is not a source of dust during summer. TSF3, the tailings rehabilitation trial area, has been rehabilitated and can no longer receive tailings; the rehabilitation is well-established and no dust is generated from TSF3. TSF2 is the only facility currently accepting tailings and occupies an area of about 35ha.

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An embankment raise to TSF 2 to 1,275mRL is currently under construction, together with a planned buttress to also be constructed along the south and west embankments once ground stability works are complete.

Construction of TSF4 is planned to commence in Q1 2022, with the design now modified to include a clay lined floor of the whole TSF4 footprint to meet the regulator's hydrogeological concerns.

The volume of tailings produced from the mine will increase from the current rate of 3.1Mtpa to approximately 9Mtpa. The additional TSF4 is planned to accommodate the 133Mt of tailings with a further TSF or extensions required to accommodate all the life of the project tailings. TSF4 is to be constructed to the south of the existing tailings storages (TSF 1-2) to accommodate the additional tailings.

Water from tailings is returned to the processing circuit via the Clear Water Pond. A series of toe drains and sumps are maintained to collect TSF seepage which is also returned to the water circuit. GHD is commissioned to undertake an independent inspection of tailings facilities and the 2017 annual inspection found all three TSFs and clear water pond to be in a satisfactory condition.

## **Environmental Management**

Talison's Greenbushes operation has stringent environmental operating conditions which are managed through an Environmental Management System ("EMS") which is certified under ISO 14001:2015 Environmental Management Standards.

#### Water Management

Water for processing is sourced from rainfall and stored in several site process dams, with the majority of the water used being recovered and recycled throughout the site. Surface water quality is measured and reported on a monthly basis. Water quality monitoring bores located around the process plant and tailing dams are monitored quarterly to ensure the operation has minimal impact on ground water quality.

Water management on site aims to recycle and reuse as much water as possible. The main process water flows circulate between the lithium plants, the TSF and Austin's/Southampton Dams (Figure 4). Additional flows exist between other constructed water storage facilities (including Cowan Brook Dam, the site's largest water storage), the tantalum secondary plant and the mining pits. Water storage works to increase the current capacity of Austin and Southampton dams are planned to begin in Q1 2022. Talison is proactively managing the water quality leaving the site and has constructed a water treatment plant to reduce lithium levels in the discharge waters. While the levels are not considered to impact deleteriously on the environment, Talison consider that reducing the levels is prudent.

## Social and Community

Talison maintains a close and co-operative relationship with the local community. This includes the provision of financial and other support to community groups and participation in local community activities which includes community programs and projects, tourism, environmental activities, schools and educational programs. These proactive community relations programs help provide additional economic and social benefits for the communities and regions surrounding Talison's lithium operations.

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#### Conclusions

BDA has reviewed those environmental aspects which are considered a material part of the project and which may have significant implications for ongoing mine operations, costs and timing, with particular reference to the TSFs and mine closure and rehabilitation estimates.

Based on the information provided by Talison and from site visits, BDA considers that the strategies for environmental protection, pollution control and monitoring are appropriate. The ISO 14001 Environmental Management Systems deployed at Greenbushes provide an excellent environmental management base, setting out the numerous statutory obligations, policy statements and management objectives and targets, and standard operating procedures. The socio-economic benefits which positively impact on the Greenbushes community are an important driver to ensuring continuing community support for mining in the area.

#### 4.10 Greenbushes Lithium Production Schedule

The production schedule summarized in Table 4.17 is based on the financial model provided by Talison and reflects proposed expansion of the Greenbushes lithium production. Production is planned to be expanded from the current three plants, TGP CGP1 and CGP2, crushing around 4.6Mtpa, up to 9.5Mtpa with the construction of two additional CG plants over the period to 2027 and a tailings retreatment plant (TRP).

## **Table 4.17**

Year	Ore Mined Mt	Mined Ore Grade % Li2O	Ore Crushed/Processed <u>Mt</u>	Tailings Retreatment Mt	Lithium Concentrate Mt
2022	5.4	2.2	4.5	1.6	1.40
2023	5.1	2.1	4.7	2.0	1.48
2024	4.7	2.0	4.7	2.0	1.48
2025	6.2	2.0	6.6	2.0	1.88
2026	9.2	1.9	7.0	2.0	1.96
2027	8.8	2.1	9.2	0.4	2.19
2028	8.5	2.1	9.5		2.18
2029	7.2	1.7	9.5		2.01
2030	8.1	1.7	9.5		2.01
2031	7.2	1.8	9.5		1.95
2032	10.2	1.7	9.5		1.92
2033	10.5	1.7	9.5		1.88
34-42	73.4	2.0	74.4		15.41
Total	164.6	2.0	168.1	10.0	37.74

#### **Forecast Production Schedule**

Note: figures in the table may not sum due to rounding; the lithium concentrate production includes product from both ore crushing/ processing and tailings retreatment

The Greenbushes LOM production plan is based on a life of around 21 years under the assumption of expanded production to 9.5Mtpa (which includes CGP3 and CGP4), based on the Ore Reserves at September 30, 2021. The LOM average grade of ore mined is 2.0%  $Li_2O$  based on a cut-off grade of 0.7%  $Li_2O$ . The LOM strip ratio is projected to average 4.4:1 (waste:ore).

The total material moved under the proposed mine production schedule will increase from around 3Mtpa of ore to a peak of 10.5Mtpa. The current fleet uses four 125/140t excavators and a fleet of 15 haul trucks and is conducted by mine contractors. The increase in production will necessitate higher mining rates which will be achieved with a new mining contract with six 260t excavators, up to 45 140t haul trucks and 16 blast hole drill rigs from 2023.

The main production source is the C3 pit; CG ore can be mined from C1, C2 and C3 pits while the TG ore type is presently limited to the C3 pit; Kapanga pit will also be available for CG ore once ore mining commences in 2024. The schedule leads to a stockpile of around 8Mt of ore as the TG plant and the four CG plants achieve full production of approximately 9.5Mtpa. With these stockpiles there is generally a low risk in maintaining ore feed to the crushers. Talison has noted that approximately 5.8Mbcm or 15Mt of Inferred resources lie within the pit design; further drilling could improve the confidence in some of these resources to provide additional feed to the mill but at this stage they are not included in the Ore Reserves.

The Measured, Indicated and Inferred Mineral Resources at December 31, 2021 total around 340.5Mt at 1.6%  $Li_2O$  at the Central and Kapanga lodes and the Ore Reserves total 168.1Mt at 2.0%  $Li_2O$  at December 31, 2021.

Table 4.17 provides a forecast production schedule based on the Proven and Probable Ore Reserves contained within the current pit designs of Central Lode and Kapanga and also includes the reclamation of TSF1 tails, described in detail in Section 4.13. The Central Lode orebody is already exposed in the C1, C2 and C3 pits and the current LOM strip ratio of waste to ore is 4.4:1 including the extension of the open pit to include Kapanga. The ore and waste volumes mined on an annual basis are shown in Figure 19. BDA understands further mine planning by Talison is progressing on the open pit schedule which will allow further optimisation of the overall operation.

The annual tonnage of ore milled and concentrates produced is projected to continue to increase from the 2021 level of 3.6Mt of ore and 0.95Mt of concentrates in response to an anticipated increase in demand for lithium chemicals. Talison plans to ramp up CGP2 to design production in 2022, with the first year at full capacity in 2023 and to use CGP1 for processing of higher grade ore. The TRP will commence production in 2022 and the combined product from TGP, CGP1, CGP 2 and TRP will produce around 1.5Mt of lithium concentrate. CGP3 and CGP4 are scheduled to commence production in 2027 respectively; by 2027 production of concentrate is forecast to reach around 2.2Mt. The production rate increase proposed for the period 2021-2027 is dependent on increased demand for lithium, and the rate at which production increases may change if market demand differs from the assumptions in the LOM model.

The forecast range and tonnage of products from the TGP and the four CGPs have been determined by Talison based on projected demands; however, a range of different products is achievable from processing the Ore Reserves through the various plant circuits. Market conditions are the critical input to future production; BDA is not a specialist in lithium marketing but notes that Wood Mackenzie has assessed that the market demand for lithium concentrates will continue to expand at a rate which will enable Talison to deliver the proposed tonnages.

BDA considers that the proposed production schedule is achievable but will rely on the forecast increases in the demand for concentrates over the period from 2021 to 2027. BDA is of the view that applying the marketing assumptions based on Wood Mackenzie's forecast into the valuation model is a reasonable approach but notes that there is a marketing risk inherent in the forecast.

## **COMPETENT PERSON'S REPORT**

#### Conclusions

BDA considers that the mine contractor has the capacity to meet the planned production schedule in the short term, if equipment performance is maintained. Overall planned material movements are considered achievable with increases in the mine equipment fleet provided by the mining contractors with reasonable pit advance rates commensurate with the planned equipment. Contract management during the various changes will be critical in ensuring step increases in mine production are achieved.

Talison plans to ramp up production from the 2021 level of around 950kt of concentrates to 1.4Mt in 2023 when CGP2 ramps up to full production and TRP is at full capacity, and then to increase concentrate production over the period to 2027 when concentrate production will reach around 2.2Mt.

BDA considers the production schedule provides a reasonable basis for assessment of future performance but notes that it relies on rapid expansion in the market for chemical grade concentrates.

## 4.11 Capital Costs

Capital expenditure of A\$1,797M is forecast over the LOM from January 1, 2022 to the end of 2041. Significant capital items are A\$440M for the completion of the CGP3 engineering and construction, A\$537M for an additional process plant (CGP4), A\$115M for the completion of an expanded tailings storage facility (TSF4), A\$99M for an expanded mine services area (MSA) and A\$14M for a 132kV power project.

Allowances are included for A\$423M of sustaining capital over the LOM. Sustaining capital is generally the cost of replacement of fixed equipment, mobile equipment and service vehicles plus upgrades to existing tailings storage facilities.

A breakdown of the proposed LOM capital expenditure is presented in Table 4.18.

### **Table 4.18**

## **Forecast LOM Capital Expenditure**

Activity	LOM Total (A\$M)
Development—Expansion	162
Plant and Equipment—Expansion	1,185
Development—Sustaining	55
Plant and Equipment—Sustaining	368
Exploration	25
Vehicle Leases	2
Total	1,797

Note: there may be some rounding errors in totals

*Development—Expansion* costs comprise the costs of TSF4 including the costs of obtaining necessary statutory approvals for TSF4. A contract has been let for the construction of the facilities. The forecast costs are taken from the project cost control system.

## **COMPETENT PERSON'S REPORT**

*Plant and Equipment—Expansion* costs include the costs of CGP3, CGP4, the TRP, the 132kV power supply facilities, the MSA, a mine access road and upgrades to associated site buildings and service facilities. Construction of CGP3 is scheduled to commence in Q3 of 2022, with production scheduled to commence in Q3 of 2025. The CGP4 expansion is scheduled to be constructed in 2025 and 2026.

The forecast costs to complete the current CGP3 expansion project, the TRP, the 132kV project and the MSA, which have commenced or have been approved by Talison, are taken from the cost control systems for the various projects.

The estimates for the CGP4 expansion and associated crushing facilities are based on conceptual and scoping studies carried out by consultants and contractors with experience and expertise gained from previous expansions and include contingency allowances consistent with industry standards for such studies.

Other development and plant and equipment costs for expansions have been estimated by Talison management from historical unit costs and supplier and contractor quotations.

*Development—Sustaining* costs include the costs of mine cutback preparation works, costs of additional works on the existing tailings storage facilities, TSF1 and TSF2, and the costs of closing the Floyds waste rock facility. These costs have been estimated on the basis of current designs, contractor quotations and historical unit rates.

*Plant and Equipment—Sustaining* costs include the costs of replacement of fixed equipment, mobile equipment and service vehicles. These costs have been estimated on the basis of supplier quotations and historical unit rates. After 2026, a nominal allowance of A\$20M per annum has been included with the allowance being based on historical experience.

The estimates of exploration capital costs have been prepared by Talison management based on the exploration program, historical unit costs and supplier and contractor quotations.

There is potential for increased development costs to fully account for the extra waste and tailings from the extraction of the Kapanga open pit above the forecast sustaining costs. Any potential increase is expected to be within the capital cost sensitivity used in the valuation in Section 7.5.

## Conclusions

In BDA's opinion the estimates of capital costs for expansion, sustaining and exploration costs, being based on Talison's work plans, historical costs and quotations are reasonable and appropriate for budgeting purposes.

BDA considers the cost control methodology and data used to prepare the forecasts of capital costs for the CGP3 Project to be generally reasonable and appropriate. Cost estimates for the further CGP4 expansion are based on conceptual and scoping studies carried out by consultants and contractors with experience and expertise gained from previous expansions and include contingency allowances consistent with industry standards for such studies. For those reasons, in BDA's opinion, the estimates are reasonable and appropriate for budgeting purposes. Talison has a proven record of achieving construction within the budgetary and schedule constraints.

## 4.12 Operating Costs

Table 4.19 shows the actual costs and unit cost of concentrate for the last four years, 2018-2021, by department at the Greenbushes site. The unit site cash cost over the last four years has averaged A\$216/t of concentrate with cash cost of production after deferred waste mining and inventory adjustments of A\$189/t of concentrate.

## **Table 4.19**

#### **Operating Costs for the Greenbushes Lithium Project—Actual 2018-2021**

Item	Unit	2018 Actual	2019 Actual	2020 Actual	2021 Actual
Operating Costs					
Mining	A\$M	53.24	79.15	65.96	78.70
Processing	A\$M	72.41	88.91	60.39	92.15
G&A	A\$M	11.03	14.88	14.57	21.00
Total Site Operating Costs	A\$M	136.67	182.94	140.93	191.84
Product Transport and Marketing	A\$M	14.30	18.78	12.91	19.99
Royalty	A\$M	29.48	41.86	16.99	80.60
Total Operating Cash Cost	A\$M	180.45	243.58	170.83	292.43
Unit Operating Costs					
Mining	A\$/t Conc	73.53	103.52	113.73	82.49
Processing	A\$/t Conc	100.00	116.29	104.13	96.59
G&A	A\$/t Conc	15.23	19.46	25.12	22.02
Total Site Operating Costs	A\$/t Conc	188.76	239.27	242.99	201.10
Product Transport and Marketing	A\$/t Conc	19.75	24.56	22.25	20.96
Royalty	A\$/t Conc	40.71	54.75	29.30	84.49
Total Operating Cash Cost	A\$/t Conc	249.23	318.58	294.54	306.54

Note: Conc = spodumene concentrate

A summary of the estimated LOM operating costs is shown in Table 4.20. The forecast costs are in real 2021 dollar terms.

## **COMPETENT PERSON'S REPORT**

#### **Table 4.20**

### **Projected LOM Operating Costs**

Activity	Unit	Unit Cost
Mining Cost		
Workforce Employment	A\$/t Ore	2.69
Consumables	A\$/t Ore	2.41
Fuel, Electricity and Water	A\$/t Ore	2.42
Repair and Maintenance	A\$/t Ore	0.88
Mine Contractor	A\$/t Ore	24.67
Subtotal Unit Mining Cost	A\$/t Ore	33.07
Processing Cost		
Workforce Employment	A\$/t Ore	8.23
Consumables	A\$/t Ore	5.91
Fuel, Electricity and Water	A\$/t Ore	4.05
Repair and Maintenance	A\$/t Ore	7.70
Subtotal Unit Processing Cost	A\$/t Ore	25.89
G&A Cost		
On and Off-Site Management	A\$/t Ore	4.00
Environmental	A\$/t Ore	0.74
Subtotal Unit G&A Cost	A\$/t Ore	4.74
Total Site Operating Unit Costs	A\$/t Ore	63.70
Total Site Operating Unit Costs	A\$/t Conc	283.64
Product Transport & Marketing	A\$/t Conc	51.88
Royalty	A\$/t Conc	77.71
Total Operating Cash Cost	A\$/t Conc	413.23

Projected mine unit operating costs over the LOM are forecast to increase incrementally as the mining gets deeper over the life of mine and haul cycle times increase. The annual mining strip ratio varies significantly over the life of the mine and the mining unit costs per ton of ore also vary with the strip ratio. Processing and G&A unit costs decrease as the processing rates increases and fixed costs are distributed over a higher tonnage.

Estimated average annual mining costs for the next five years are between A\$28-65/t of ore processed which reflects the variable stripping rates in various cutbacks; these are consistent with the current costs, with LOM unit mining costs averaging around A\$33/t. The recent costs have varied depending on the quantities of weathered rock being mined (which reduces drilling and blasting requirements), strip ratio, drilling and blasting costs as well as haulage cost which increases with depth. Major mine operating costs comprise Mine Contractor costs, including drill and blast and load and haul activities; other significant costs are fuel and explosives (included in Consumables) as well as Talison mine management (Workforce Employment costs). Waste dump management and increasing haulage distance to the dumping area as it extends south is allowed for in the LOM operating costs.

While BDA considers there is some risk from cost input increases including fuel and labor costs, overall the estimates are considered a reasonable guide to likely mine costs. Other mine costs reflect recent historical costs and BDA considers they have been appropriately prepared.

Greenbushes' process operating costs are inclusive of crushing costs and are forecast to average approximately A\$26/t of ore processed over the life of mine. Process operating costs are made up of costs for labor, power, consumables such as grinding media and ferrosilicon (used in the heavy media plant), reagents and chemicals and maintenance consumables. CGP processing costs have ranged from

US\$23-34/t processed over the last three years but the costs have been higher during commissioning of CGP2 and the replacement of hire crushers with CR1 and 2 crushers. BDA considers that the forecast average operating cost is reasonable; limited opportunity for economy of scale exists given that the throughput increase will be generated by the construction of three additional processing plants, each with similar capacities to that of CGP1.

Talison is forecasting an almost constant General and Administration (G&A) cost over the LOM, as it is assumed the majority of the costs are effectively fixed with a small proportion variable with processing throughput rate. Site administration costs, on a cost per ton processed, have been in the range A\$4-6/t ore processed over the last three years and are projected to decrease from approximately A\$7.40/t in 2022 to around A\$4.10/t as production increases with an average of A\$4.7/t over the LOM. This level of cost and the generally fixed nature of G&A is reasonably consistent with comparable Australian mining operations. There appears to be some potential for higher administration costs, although Administration costs are generally low due to the location of the operation in a rural area reasonably close to Perth.

Sales costs and royalties increase as production and prices received for lithium products increase over the life of the operation. Selling expenses include packaging, land transport, storage, ship loading, and marketing development costs as well as shipping freight costs. Shipping costs to China, Europe and the USA are projected to remain at current levels in the projections. If there are any further domestic sales in the future, it would be expected that transport costs would be relatively lower than for export. Overall selling expenses are projected to be stable on a unit basis for the LOM. BDA considers that the allowances for the proposed administration, selling and royalty costs are reasonable with some potential for slight increase in administration cost.

Talison has entered into an agreement with GAM on the costs of operating the additional circuit that recovers tantalum from the existing processing plants. The payment from GAM is treated as 'other revenue' in the financial model and is not deducted from the processing operating costs.

#### **Conclusions**

Unit mining cost estimates reflect the current cost structure and the contract mining unit rates with unit costs increasing marginally with depth. BDA considers this is a reasonable approach but notes there is some potential for escalation of cost inputs, including fuel and labor costs.

The contract renewal in 2023, when there will be an increase in the mining fleet, may see the cost structure change but the rates should remain similar or better than current rates unless there is a substantial increase in activity within the contract mining market at the time of renewal. BDA notes that Talison has a record of managing contract mining costs and considers this is a reasonable approach but notes there is some potential for escalation of contract cost inputs.

Unit process operating costs are forecast to remain relatively constant over the projected LOM despite the increased production because the production increase is generated by duplication of the processing plants. The process operating costs are considered generally reasonable but rely on a ramp-up in tonnage as global lithium demand is projected to increase.

Total operating costs are projected to increase as production ramps upwards, but the unit site operating cost of concentrate production is also projected to remain relatively stable.

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BDA considers that the projections for total operating costs over the LOM, and the assumptions from which these are derived, are generally reasonable, but are subject to some uncertainty given the 21 year time period and the potential variability in cost items over an extended period.

## 4.13 Greenbushes Tailings Storage Facility 1 ("TSF1")

## **Background and Summary of Status**

Tailings storage facility TSF1 was used for tantalum plant tailings deposition for approximately 30 years before the tantalum primary plant was placed on care and maintenance in 2006. During this period, the process plant recovered tantalum and tin, and the lithium grade of the tailings was relatively high compared to the current grade of tailings being deposited in TSF2. Under current market conditions, the TSF1 tailings grade could be considered commercially viable when compared to other lithium deposits, particularly since the material lies at surface, and has already undergone comminution. Consequently, Talison embarked on a drilling program in 2016/17, leading to resource modeling, metallurgical testing and a feasibility study completed in 2018.

The drilling program and bulk sample testing of the tailings has defined a Mineral Resource and Ore Reserve for TSF1. The feasibility study concluded that the tailings would best be processed in a separate treatment plant constructed specifically for the tailings, at a throughput of 2Mtpa. Construction of the plant and associated infrastructure was largely completed as of the BDA November 2021 site visit, with hand-over to Talison due in January 2022, followed by plant commissioning over a planned four month period. The tailings mining contract has been let, with the mining contractor due to mobilize in early January 2022.

The Greenbushes Mine Mineral Resources and Ore Reserves for TSF1 as of August 2021 have been developed by Talison in compliance with the JORC Code 2012 Edition. An outline of the exploration, geological and resource data is provided below.

#### Geology, Exploration and Data Acquisition

TSF1 is situated in a central part of the Greenbushes property, adjacent to CGP2 and the C1 open pit (Figure 4). The deposit is a horizontal body approximately 1,000m long by 700m wide, extending to an average depth of approximately 20m. Sediments within TSF1 were deposited over many years up to 2006. The grade and geological continuity of the deposit is a function of the ore types processed through the processing plants that generated the tailings and the method of disposal into the TSF. Tailings slurry was discharged at the walls, flowing towards the center, with the heavier spodumene settling out first.

Preliminary aircore drilling in 2016 confirmed the presence of >1% Li<sub>2</sub>O material in the upper part of TSF1, and a 34 hole 759m resource drilling program was undertaken in February/March 2017 using a sonic drill rig to provide continuous core samples through to the base of the tailings dam, from a 3 inch diameter hole with 1.5m individual core runs. All holes were photographed in their entirety, providing a visual record of recovery, which was high.

Each sample interval was placed in PVC half-pipes or gutters, and geologically logged by a Talison site geologist. Geological observations, combined with analytical work, demonstrated that an upper zone of white to gray fine sand and silt tailings carried more or less continuous >1% Li<sub>2</sub>O grades

## **COMPETENT PERSON'S REPORT**

typically over the top 5-10m (the Enriched Zone—"EZ"), underlain by a similar thickness of lower grade (typically 0.4-0.9%  $Li_2O$ ) gray fine sand and silt sediments (Depleted Zone—"DZ"), which was underlain in turn by a basal brown to orange clayey layer with very much lower lithium grades. Holes were completed in natural ground beneath the TSF.

Drill collars were nominally at 200m separation across the TSF (Figure 21), which Talison considered to be sufficient to establish geological and grade continuity appropriate for Mineral Resource and Ore Reserve estimation. Collars were surveyed by differential GPS to an accuracy of 10cm, while the dam structure had been surveyed by airborne and ground survey methods with 1m accuracy. Down-hole surveys were not undertaken as all holes were vertical and very short.

## Sampling, Sample Preparation and Analysis

The site geologist undertook all sampling, under the supervision of the site Geology Superintendent who is a Competent Person under the JORC code. Continuous half core samples were scooped or cut as appropriate over each 1.5m drilling interval and submitted by the geologist direct to the on-site laboratory for analysis by AAS for  $Li_2O$  and XRF for a 36-element suite. The sample size averaged approximately 5kg and is appropriate for the fine grain size and homogenous nature of the plant tailings product.

The remaining half core was utilized for metallurgical testing.

Assay procedures were as described in Section 4.3, although coarse crushing was obviously not required.

All of the above geological and sampling information was acquired electronically and captured in the site acQuire database, as described in Section 4.3.

## Assay Quality Control

No field duplicates were collected as the remaining half cores were required for metallurgical testing. Assay quality was monitored by submission of two samples of reference materials of known value with each batch of samples, and by internal laboratory quality control protocols (see Section 4.3, including data from TSF1 in Figure 11).

A review of standard reference material results confirmed high quality laboratory performance in terms of accuracy, with no results approaching the error thresholds (Figure 10).

## Data Security

All geological, survey and sampling data was collected electronically and imported into an SQL geological database via proprietary software acQuire. The software has inbuilt data integrity and validation controls and strict user import formats to restrict erroneous data entry. The site geologist compared planned drill sites with survey data to validate drill collar position information.

Drill samples were delivered directly to the laboratory by the site geologist. Assay data was received electronically from the laboratory and imported into the database.

Geological logging and assay results were reviewed on screen by the site geologist to provide validation between field logging and analytical data.

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## Density

Samples were collected from five sites across TSF1 (Figure 20) using a 1,621 cubic centimeter cylinder to provide bulk density measurements. Values ranged from 1.55 to  $1.71t/m^3$  (dry) with little variation across the TSF, and the average value of  $1.67t/m^3$  was used globally for resource tonnage estimation.

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Figure 21 804-201 (03) November 2021 **TSF1 SONIC DRILLING** 

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### **Resource Modeling and Estimation Procedures**

The approach was based on three-dimensional interpretations of the three geological and grade domains as defined by drilling and assaying. Grade modeling of Li<sub>2</sub>O within the individual domains

# **COMPETENT PERSON'S REPORT**

was by the Inverse Distance Squared technique ("ID2"), using industry standard Surpac software. The Mineral Resource modeling work was supervised and reviewed on site by the Talison Geology Superintendent, a Competent Person under the JORC Code, with over 5 years of experience at Greenbushes. In more detail, Mineral Resource modeling comprised the following steps:

- all drill data related to 1.5m intervals, therefore no compositing was undertaken
- geological domains were defined using a combination of geological and analytical data (Figure 22, upper) to distinguish between:
  - white to gray-white fine sand and silt of the upper EZ with grades almost universally above 0.7% Li<sub>2</sub>O and averaging 1.47% Li<sub>2</sub>O
  - an underlying zone of typically greyer fine sand and silt generally grading between 0.4% and 0.9% Li<sub>2</sub>O, averaging 0.67% Li<sub>2</sub>O, and referred to as the Depleted Zone (DZ)
  - the basal clayey layer with very low lithium values.
- the domains were reviewed in Surpac with the drill holes loaded on screen and were found to honor the geology and be correctly snapped to drill hole traces
- the three domains were wire-framed and Li<sub>2</sub>O data selected; the histograms of the EZ and DZ domains were approximately normal (Figures 22 (lower) and 23 (upper)) and suggest each contains a single data population valid for estimation without imposing restrictions on high grades
- variographic analysis using Surpac software indicated the lithium grade data to be omnidirectional with a nugget effect of 8% for the EZ and 25% for the DZ; in light of this and the fact that the drill hole spacings approximated a regular grid, it was deemed appropriate to use ID2 (which does not involve variography) for Li<sub>2</sub>O grade estimation; no other method was investigated
- an 80m x 80m x 1.5m cell block model was created, with 10m x 10m x 0.75m sub-cells to improve definition at the boundaries of the TSF
- one grade estimation pass was completed with horizontal search axes of 200m by 50m vertical; this allowed access to data from a minimum of two holes
- a minimum of 3 and a maximum of 16 composites were used within the search ellipse for grade estimation
- approximately 2% of the total volume lying on the margins of the TSF received no grade estimate; such blocks were ascribed the mean grade of the composites of the relevant domain
- dry bulk density of 1.67t/m<sup>3</sup> was assigned to each block
- the resultant Mineral Resource model was validated visually and statistically against the input drill data.

Figure 23 (lower) shows a plan view of the average grade of blocks over the total thickness of the EZ domain, confirming that higher than average grades are concentrated towards the flanks of the TSF.

All blocks within the EZ and DZ were classified by Talison as Indicated Mineral Resource, as the geology is straightforward, the database is sound, composites display relatively low variability and predictable behavior in both domains, and spatial extents are well constrained by topographical survey information.

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TFSN		TFSNO
128		31
1.8 15.0 SL SD		Z.4 16.4 5L 5
1.9 15.0 SL SD		1.7 15.7 SL 1
1.6 10.0 SD SL	Enriched zone of fine sand and silt	1.6 15 f 5D 5
1.4 15.0 SD		1.4 10.3 50 1
0.6 15-4 SD		07 15.5 5D 1
1.6 15.0 SD SL		0.8 15.3 SD 1
0.8 150 51 50		0.6 11.0 SD 1
07 100 5D SL		06 15 / SD 1
0.4 15.0 SD SL		0.4 16 3 5D
0.4 10 1 SD SL	Depleted zone of fine sand and silt	0.7 15.1 SD 1
05 15.8 SD SL		1.0 10.2 SL 5
0.7 10.0 SD SL		0.6 10.7 SL 5
0.4 10 0 51 50		0.4 10.7 SD 1
#2 261 CL SL		0.4 10.2 54.
CL 54		01 261 CL 1
61 234 CL		0.1 332 CL
01 111 CL	Clay Zone	00 21.0 CL
01 11/ CL		03 261 CL 1
0.1 30.3 CL SD		61 252 CL 1

#### **TSF1 Geological and Assay Profile**



# **Tianqi Lithium Corporation**

Greenbushes Lithium Operations

Figure 22 BDA - 201 (03) November 2021 **TSF1 ESTIMATION PROCEDURES** 

Behre Dolbear Australia Pty Ltd

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Histogram of Li2O DZ Domain Samples



**Tianqi Lithium Corporation** 

Greenbushes Lithium Operations

Figure 23 804-201 (03) November 2021 **TSF1 - RESOURCE MODEL** 

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## **COMPETENT PERSON'S REPORT**

### **TSF1 Mineral Resource Reporting**

Talison reported an Indicated Mineral Resource in the EZ of 13.5Mt at 1.5%  $Li_2O$  at a 0.7% cut-off, with an additional Indicated Mineral Resource of 4.9Mt at 0.8%  $Li_2O$  in the DZ. However, BDA considers it prudent to reclassify the DZ material as Inferred Mineral Resource (Table 4.21) since the average grade of all DZ blocks (0.7% Li2O) is marginally below the cut-off grade and it is BDA's opinion that the current drill spacing is too wide for accurate definition of above cut-off grade DZ material which would form the basis of any preliminary mine plan. This approach has no impact on the Ore Reserves which are restricted to EZ material.

The cut-off grade is based on recoveries from metallurgical testwork and is considered to represent an economic cut-off at current market settings. All tonnages are quoted on a dry basis; no moisture measurements have been made.

## **Table 4.21**

## TSF1 Indicated and Inferred Mineral Resources—December 31, 2021

Domain	Tonnage (Mt)	Li <sub>2</sub> O Grade (%)	LCE (Mt)
Enriched Zone-Indicated	13.5	1.5	0.5
Depleted Zone-Inferred	4.9	0.8	0.1
Total	18.3	1.3	0.6

Note: cut-off grade 0.7% Li2O; Talison classified all resources as Indicated, but BDA has downgraded the DZ resource to Inferred due to uncertainties in the location of above cut-off material; resources are inclusive of reserves

Talison considered the tonnage of the Mineral Resource estimate to be accurate to +/- 10% globally given the simplicity of the deposit in a geological sense, its clearly defined dimensions and the uniformity of bulk density measurements. There may be small volumes of unrecorded and unknown rock fill within TSF1 that reduce the tonnage, but that volume is expected to be much less than 10%. A similar accuracy is ascribed by Talison to the grade of the Mineral Resources in both domains, but BDA considers there to be less certainty regarding the location of DZ resources above cut-off and recommends these be reclassified as Inferred.

#### **Ore Reserve Reporting**

The Ore Reserve estimation process was overseen by the Talison Manager Mining and Environment, a Competent Person under the JORC Code, with over 12 years of experience on the site.

Commencing with the resource block model, the following factors were considered:

- only tailings within the EZ domain and within 7m of the surface of the TSF were considered for mining; the depth limit reflects increasing moisture and slimes content in deeper sediments
- mining would be essentially an earth-moving exercise, undertaken as a bulk mining operation from surface
- a batter of 3:1 was applied at the limit of the mining area

- a mining recovery of 97% was applied to the Mineral Resource tonnage, due to removal of the vegetation at surface; no other mining loss was deemed appropriate
- a grade dilution factor of 3% was applied with a diluting grade of 0.8% Li<sub>2</sub>O from the DZ below the mined area, where appropriate
- tenders were received from four qualified mining contractors to provide an outline of proposed operations and associated mining costs for a 2Mtpa (dry) operation
- process testwork on Sonic drill cores confirmed that approximately 70% recoveries of spodumene could be achieved from flotation of de-slimed EZ material in a saleable product
- no environmental or infrastructure problems are anticipated; there is minimal overburden to be disposed of, and tailings from the re-treatment plant will be placed in the current tailings dam TSF2
- on completion of mining, tailings from on-going operations will be deposited back into TSF1; expansion of power and water supplies for TSF1 tailings treatment will be implemented as part of the overall plant expansion program
- Talison completed a feasibility study, including process design, contractor mining, processing, administration and selling costs and a capital cost estimate for a stand-alone plant; evaluation of financial results indicated that construction of a stand-alone plant to treat 2Mtpa of tailings for five years would be economic and a more attractive option than blending with ROM ore in existing or future CGP plants

Further details regarding mining and processing studies are provided in the following sections.

The TSF1 Probable Ore Reserves are reported by Talison at a 0.7% Li<sub>2</sub>O cut-off which is an economic grade under current market conditions. Ore Reserves are shown in Table 4.22. Tonnages are on a dry basis, and the Reserves are a sub-set of the reported Mineral Resources.

## **Table 4.22**

## TSF1 Ore Reserves—December 31, 2021

Category	Tonnage (Mt)	Li <sub>2</sub> O Grade (%)	LCE (Mt)
Probable	10.1	1.4	0.4
Total	10.1	1.4	0.4

## Mining

The mining of the tailings is relatively simple, with no selective mining, as the tailings form a continuous body to be extracted. Initially the vegetation layer of approximately 0.3m will be stripped off the surface of the tailings prior to the extraction of the tailings. The depth of mining is limited to around 7m; this depth has been determined by grade as well as an increase in moisture and slimes encountered during the drilling program.

Four potential mining contractors with tailings mining experience provided budget pricing and a proposed mining method. Each contractor suggested similar mining methods, using excavators and

trucks, with the trucks being kept on dry tailings material. Dozers would be used to push material to the excavators to keep road footprints to a minimum. The planned mining rate of 5,500t/day was considered achievable with the proposed equipment on a 7 days/week operation, with sufficient plant and equipment redundancy to accommodate scheduled maintenance and downtime. The contract has now been awarded and the contractor will mobilize to site in early 2022. The full production will be 2Mtpa; as there is no waste within the defined reserves, no waste mining is required.

During mining it is expected dewatering of the tails will be needed in some areas of TSF1 to lower moisture levels to ensure maintenance of the proposed mining rate. Dust control will also be an important part of the mining operation.

## Processing

Preliminary testwork has been carried out on samples from TSF1 using a similar flowsheet to that used in CGP1 on the finer fraction of the ore processed. Initial results indicate that a lithium recovery of around 70% can be achieved on the material tested and the results are considered appropriate and reliable for use in the economic analysis. On material with a head grade of 1.5-1.6%  $Li_2O$ , a yield of around 17% of the tonnage, containing 70% of the  $Li_2O$ , was achieved to a product equivalent in quality to an SC6.0 concentrate.

The TRP, which is a separate plant, has been constructed to process the tailings and plant commissioning commenced in early 2022. Given the plant adopts established technology already in use at site, it is expected the design and capacity will reflect current experience, with the plant planned to ramp up within 6-8 months, achieving nameplate capacity by 2Mt in the second half of 2022. In terms of processing requirements and considering that the tails have already been milled, the grain sizing of the tailings means that no crushing or grinding processes are required in the flowsheet.

## Conclusions

BDA has not undertaken an audit of the geological, assay and density data as part of this review. However, BDA has reviewed the geology, data acquisition and quality control procedures and QA/QC results presented by Talison and concludes that the drilling and sampling procedures are appropriate for this type of deposit, and that database quality provides an adequate basis for estimation of Mineral Resources and Ore Reserves under the JORC Code.

BDA considers that TSF1 Mineral Resource modeling has been undertaken professionally by experienced Talison staff. Data validation has been completed, confirming acceptable database quality, and the geological/grade domain definition within the deposit is considered to be wellfounded. The drill data gives wide-spaced but acceptable coverage of the deposit and provides a suitable basis for Mineral Resource estimation. The Mineral Resource modeling approach is considered appropriate, in accordance with industry standards, and in compliance with the JORC Code. BDA considers that the classification of Indicated Mineral Resource as applied to the EZ domain Mineral Resource is acceptable, since virtually the entire zone is above cut-off grade and will be bulk mined in its entirety, and therefore that part of the Mineral Resource model forms an acceptable basis for mine planning and generation of Ore Reserves. As noted earlier, BDA has reservations about classifying DZ Mineral Resources as Indicated Mineral Resource, despite the similar drill coverage. In this domain, the average grade of all blocks, within the DZ, is marginally below the mining cut-off grade, and a significant degree of selective mining would be required to

extract the blocks defined within the Indicated Mineral Resources. In view of this, BDA considers that the drill spacing is too wide for accurate definition of above cut-off grade material which would form the basis of any preliminary mine plan. It must be noted, however, that this view has no impact on the TSF1 Ore Reserves which are restricted to the EZ domain.

BDA has reviewed the 2021 Ore Reserve and considers it to have been completed by competent persons, in accordance with industry standards, and in compliance with the JORC Code. BDA has assessed the mine design for ore extraction to be appropriate and the mining schedule achievable. The estimated mine recovery and dilution factors appear reasonable. Process testwork indicates that acceptable recoveries to saleable product can be achieved. Financial evaluation indicates a sound economic case for re-treating the TSF1 tailings in a stand-alone plant. BDA considers the Ore Reserves will not be materially affected by foreseeable permitting, title, environmental, or metallurgical issues, based on the information supplied by Talison.

Overall, BDA considers the 2021 TSF1 Probable Ore Reserves to be an appropriate representation of the recoverable tons and grade, and suitable for use in financial modeling of the project.

Mining of the tailings is a relatively straightforward operation, provided the planned mining area is kept appropriately drained. BDA considers the planned approach is reasonable and practical and that the proposed mining rate should be achievable.

Initial process testwork on TSF 1 tailings indicates that similar processing techniques to those used in CGP1 can be used to recover about 70% of the contained  $Li_2O$ . BDA considers the planning around the proposed tailings treatment plant is based on existing knowledge, experience and testwork and that the work provides a reasonable basis for valuation.

Mr Daryl Baker, Talison Geology Superintendent, and Mr Andrew Payne, Talison Mine Planning Superintendent were the Competent Persons under the JORC Code for the TSF1 Mineral Resources and Ore Reserves respectively.

## 5.0 CUOLA PROJECT

## 5.1 **Project Overview**

## Location

The Cuola Project is located in the mountainous area of western Sichuan, within the administration area of the Xinwei Village, Murong Township, Yajiang County, Ganzi Tibetan Autonomous Prefecture ("Ganzi Prefecture"), Sichuan Province in China (Figures 1 and 3). The geographic location of the project site is defined by longitudes from 101°13'15"E to 101°15'00"E and latitudes from 30°15'15"N to 30°18'00"N.

The Cuola Project site is located a linear distance of approximately 38km from the Yajiang County seat in a north-northeast direction. However, the current primary access to the project site is from the east, with a 4km dirt-and-gravel road to the Jiajika Mine owned and operated by a third party and within the administration area of Kangding City, and a further 33km of dirt-and-gravel road east to the town of Tagong in Kangding City (Figure 3). Tagong is located on the sealed provisional highway S215, which connects to the national highway G318 in the south. The road distance from Tagong to Kangding (also the location for the Ganzi Prefecture government) is 108km, and the road distance from

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Tagong to Chengdu located further east is 477km. A new expressway is being constructed approximately parallel to G318 and there is also a parallel railroad currently under construction. It currently takes approximately seven hours to drive from Chengdu to the Cuola Project site, but the distance and driving time will be shortened when the new expressway system is completed and overall transportation facilities will be significantly improved.

The Cuola Project is located at the south-eastern edge of the Qinghai-Tibet plateau at an altitude ranging from 4,100m to 4,900m. The primary spodumene pegmatite veins outcrop at elevations ranging from 4,200m to 4,550m. The site is relatively flat, consisting of glacially eroded rolling hills and lakes, surrounded by high glacial mountains in most directions. The ground surface in the area is covered by high-altitude bushes and grasses and is considered as grassland.

The climatic conditions at the Cuola Project site are relatively severe, with a large temperature difference from day to night and thin air and low oxygen content. Temperatures range from a summer high of 23°C to a winter low of minus 24°C. The rainy season is from May to October, when the climate is generally mild, with temperatures generally ranging from 5°C to 22°C; the summer months (June to August) are also associated with significant thunder and lightning storms, which can cause damage to humans and livestock. The snow and frost season is from November to April, with temperatures generally ranging from -3°C to -24°C with a frost depth of 1-2m. Annual precipitation averages approximately 770mm while the annual evaporation rate averages approximately 1,135mm.

Yajiang County has a land area of 7,855km<sup>2</sup> with a population of approximately 50,200 in 2016. Residents in Yajiang as well as in Kangding City in at the east and other surrounding areas are mostly Tibetan and are commonly living in towns and river valleys. The surrounding area of the Cuola Project site is sparsely populated by nomads, conducting mostly grazing and collecting Chinese caterpillar fungus and other valuable Chinese medicines. The local economy is relatively under-developed and there is surplus labor in the area that can be employed by mining projects. Supplies for the Cuola Project can be obtained from Tagong (population several thousand), Yajiang County Seat (population more than ten thousand), Kangding (population more than a hundred thousand) and Chengdu (population more than ten million).

Water resources and mineral resources are abundant in the area. The Cuola Project is part of the larger Jiajika lithium mineralisation district ("Jiajika District"), which is believed to be the largest hard-rock lithium mineralisation district in China, as well as in Asia. Within the Jiajika District, the Phase I operation of the Jiajika Mine at a production rate of 240ktpa started operation in 2010, but its production was suspended due to an alleged environmental incident on October 13, 2013 (refer to Section 5.8). A second alleged environmental incident related to the Jiajika Mine occurred again on May 4, 2016. It was reported that production at the Jiajika Mine resumed in June 2019. In addition to the Jiajika Mine and the Cuola Project, there are several other lithium exploration projects in the surrounding areas.

## **History and Ownership**

Lithium mineralisation hosted by granitic pegmatite veins in the Jiajika District was first found in the early 1960s by the Ganzi Geological Exploration Brigade of the Geology Bureau of Sichuan Province. Initial systematic exploration work for the Jiajika District was conducted by the No.404 Geological Exploration Brigade ("No.404 Brigade") of the Bureau of Geology and Mineral Resources of Sichuan Province from 1965 to 1974. A total of 498 granitic pegmatite veins were identified

distributed around a granite intrusive, of which 114 veins contains significant lithium mineralisation. The Jiajika District was divided into five sections. The Cuola Project area contains most of the West and Central Sections as well as part of the South Section, North Section and East Section (Figure 24). The currently-operating Jiajika Mine is located in the East Section. The early exploration work was generally focused on the East Section and only limited work was conducted on other sections.

Tianqi Shenghe acquired the exploration license for the Cuola Project through auction in October 2008. The license number was T51320081203021204 with an area of 23.77km<sup>2</sup>. The license area was defined by six inflection points. Tianqi Shenghe engaged the No.108 Geological Exploration Brigade ("No.108 Brigade") of the Geology and Mineral Resource Exploration and Development Bureau of Sichuan Province to conduct systematic exploration work for the Cuola Project from 2009 to 2011. The No.108 Brigade is independent from Tianqi and holds a Class A exploration qualification certificate for solid minerals issued by the Ministry of Land and Mineral Resources of China. A total of 142 diamond drill holes with a total drilled length of 17,575m and a total of 136 surface trenches with a total excavated volume of 28,407m<sup>3</sup> were completed during the period. An exploration geology report with mineral resource estimates was completed based on the work conducted by the No.108 Brigade in September 2011.

After the exploration work, Tianqi Shenghe engaged the Lanzhou Engineering & Research Institute of Nonferrous Metallurgy ("Lanzhou Institute"), an independent third party holding a Class A qualification certificate for engineering design in the metallurgical industry issued by the Ministry of Housing and Urban-Rural Construction of China, to conduct a feasibility study and an initial engineering design study for the Phase I 600ktpa open pit/underground mining operation of the Cuola Project. The feasibility study was completed in February 2012 with a positive outcome and an initial engineering design study was completed in July 2012.

Sichuan Academy of Environmental Protection Science completed an environmental impact assessment report for the Phase I mining operation of the Cuola Project in December 2012, and the project was approved for construction for the Phase I 600ktpa mining operation by Environmental Protection Department of Sichuan Province on February 26, 2013.

Construction of the Phase I 600ktpa mining operation of the Cuola Project was approved by the Development and Reform Commission of Sichuan Province on July 16, 2013.

BDA was informed that the local government was very supportive of the development of the Cuola Project and asked Tianqi Shenghe to start development of the Cuola Project when some of the construction approvals were still pending. Construction of the Phase I Cuola Project started in August 2012. The Lanzhou Institute engineered the mine, processing plant and other related facilities; construction work was contracted to China MCC5 Group Corporation Limited, which holds a Class A qualification certificate for construction of metallurgical operations and has good experience for project construction Supervision Company Limited supervised the construction. However, the construction was suspended by the Department of Land and Resources of Ganzi Prefecture in October 2013 due to an alleged environmental incident related to the neighboring Jiajika Mine (refer to Section 5.8). At the time of the construction suspension, approximately 80% of the construction work for the mill and other related facilities was completed. Although regulatory approval to recommence construction/production was granted for the lithium operations in the Jiajika District in 2019, Tianqi Shenghe has not yet resumed the construction of the Cuola Project as Tianqi is currently sourcing all

the spodumene concentrates for its processing plants from Talison's Greenbushes Mine in Western Australia and the concentrate production from the Greenbushes Mine can satisfy all of Tianqi's needs at this stage.

Tianqi Shenghe received a mining license with an area of 2.069km<sup>2</sup> for the Cuola Project on April 6, 2012. The license number is C5100002012045210124005 and is valid until April 6, 2032; the license is extendable afterwards. The license area is separated into four zones with a total of 44 inflection points; these four zones cover all the identified spodumene pegmatite veins with lithium mineral resources within the original exploration license boundary (Figure 25). The elevation range for the permitted mining area is from 4,100m to 4,580m. The license allows Tianqi Shenghe to conduct a mining operation at a production rate of 1.2Mtpa. After receiving the mining license, the original exploration license for the Cuola Project was relinquished.

As a Chinese mining license only covers the area of the identified Mineral Resources, surface land used for mine facilities needs to be acquired and/or leased for a mining operation. The surface land for permanent structures, including the mill and the TSF dam for the Cuola Project was approved by the Sichuan Provisional Government in November 2015. Surface land acquisition for the mill and the TSF dam was completed in December 2017. Surface land used for open-pit mining, the TSF and other short-term and/or temporary mining facilities will be leased by the Cuola Project.





Cuola Lithium Project

SCHEMATIC DISTRIBUTION OF GRANITIC ROCKS IN THE JIAJIKA DISTRICT

Figure 24 804 - 201 (03) November 2021

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Figure 25	GEOLOGY MAP OF THE CUOLA PROJECT
BDA - 201 (03) November 2021	Behre Dolbear Australia Pty Ltd

## **Project Status**

Tianqi considers the Cuola Project as an important lithium asset held for future development for the Company, as currently the spodumene concentrate used by the Company is sourced from the

Greenbushes Mine in Western Australia. Tianqi Shenghe is currently in discussion internally when and how it should resume the Cuola Project construction.

## 5.2 Geology and Mineralisation

## **Regional Geology**

The Qinghai-Tibet Plateau is the youngest orogenic belt in the world. Subduction and collision between the Indian Plate and Eurasian Plate in Cenozoic time, commonly referred to as the Himalayan Orogeny, has created the world's youngest and highest mountain ranges. The complicated tectonic evolution during this period as well as during the preceding Indosinian Orogeny (late Permian to Triassic) and Yanshanian Orogeny (Jurassic to Cretaceous) has created a complicated structure pattern in the plateau, with associated multiple-stage magmatism and related mineralisation.

The Jiajika District is located at the south-eastern edge of the Qinghai-Tibet Plateau. Stratigraphy outcropped in the region consists of late Triassic Zhuwo Formation  $(T_3zh)$  siltstones and fine-grained sandstones with some tuffaceous and calcareous siltstone and basaltic tuff interbeds, late Triassic Xinduqiao Formation  $(T_3xd)$  mudstones with some sandstone interbeds, and Quaternary (Q) glacial sediments. The Xinduqiao Formation overlays the Zhuwo Formation with a conformable contact. The Triassic rocks in the region have undergone regional metamorphism with the Xinduqiao Formation rocks mostly converted to sericite-quartz schists.

The Triassic metamorphic rocks have been folded with folding axis direction bending from near north-south in the north to northeast then to near east-west in the south. There is dome-shaped anticline at the Jiajika District area.

The Triassic rocks at the Jiajika District area were intruded by a late Indosinian (isotope age 212Ma) Jiajika two-mica granite stock ("Jiajika Granite"). There are a series of later-stage granitic pegmatite veins and quartz veins associated with the granite. The Xinduqiao Formation schists near the intrusive were also overlapped by some thermal contact metamorphism with the formation of some typical thermal metamorphic minerals such as staurolite, andalusite and garnet. The Jiajika Granite outcrop is pan-shaped with the smaller pan-handle pointing to the north and the larger pan-basin pointing to the west-northwest direction. The intrusive outcrop is 3-4km long, 0.4-1.2km wide, with an outcrop area of approximately 4.8km<sup>2</sup>. The contact of the Jiajika Granite is steep in the south and shallow in the north, indicating that magma may have intruded from the south to the north.

The granitic pegmatite veins and quartz veins formed concentric zones around the Jiajika Granite, especially to the northern side of the intrusive: from the microcline pegmatite (Type I) zone generally within or nearby the granite, outward to the microcline-albite pegmatite (Type II) zone, the albite pegmatite (Type III) zone, the spodumene pegmatite (Type IV) zone, the muscovite pegmatite (Type V) zone and the quartz vein zone. Figure 23 shows the distribution of the Jiajika Granite stock and various types of associated granitic pegmatite veins in the Jiajika District. The pegmatite veins can occur as single veins or vein groups. The size of individual pegmatite veins is generally not very large, typically ranging from a few meters to several tens of meters wide, from several tens of meters to several hundreds of meters long. A total of 498 granitic pegmatite veins were identified and numbered at Jiajika District by the No.404 Brigade during its 1965-1974 exploration work, and 114 of the pegmatite veins were considered as Type IV spodumene pegmatite veins that contain significant lithium mineralisation. The No.404 Brigade pegmatite vein numbering system was kept by the No.108 Brigade in its 2009-2011 exploration work. The No.632 vein and the No.602 vein group in the West

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Section of the Jiajika District are the most important spodumene pegmatite veins of the Cuola Project; they are primary mining targets for the planned Phase I mining operation. The No.134 spodumene pegmatite vein is the most important in the East Section and was developed into the Jiajika Mine (production is currently suspended).

The muscovite in the pegmatite veins has been dated with an isotopic age of 1.81-1.88Ma. The locations for the sections of the Jiajika District and the Cuola Project exploration license area are also shown in Figure 24.

## Local Geology

The local geology within the original Cuola exploration license boundary is shown in Figure 23. The boundaries of the four areas comprising the current Cuola Project mining license that contain all the defined spodumene pegmatite veins with Mineral Resources are also shown in the figure.

The lower section of the late Triassic Xinduqiao Formation  $(T_3xd)$  outcrops in the area and is divided into four sub-sections.

The lowest sub-section  $(T_3 x d^{1-1})$  is composed of mostly fine- to medium-grained staurolitebearing sericite-quartz schists with some local silty schists and metamorphosed siltstones interbeds. Total thickness of the sub-section is more than 210m. This sub-section is distributed in the northern and eastern parts of the Cuola Project area.

The second sub-section  $(T_3xd^{1-2})$  consists mostly of medium- to coarse-grained staurolitebearing sericite-quartz schists. Its thickness is more than 180m and it is located southwest of  $T_3xd^{1-1}$ .

The third sub-section  $(T_3xd^{1-3})$  consists mostly of medium- to coarse-grained staurolite- and andalusite-bearing sericite-quarts schists. Its thickness is more than 150m and it is located in the southwestern portion of the Cuola Project area.

The fourth sub-section  $(T_3xd^{1.4})$  consists mostly of fine- to medium-grained staurolite-bearing sericite-quartz schists with some thin siltstone interbeds. Its thickness is more than 210m and it is located in the southwestern corner of the Cuola Project area.

The Xinduqiao Formation schists outcropping in the Cuola Project area generally have a gray to dark gray color that become grayish black with weathering. The schists have a gentle dip generally toward the southwest and the west, but generally dip to the south within the eastern portion of the project area.

Late Triassic Zhuwo Formation  $(T_3zh)$  siltstones and fine-grained sandstones and basaltic tuffs do not outcrop in the Cuola Project area.

The Quaternary (Q) cover rocks comprise glacial sediments which commonly contain boulders of various underlying rocks and have a thickness of 3 to 25m. Quaternary rocks cover approximately 40% of the Cuola Project area with numerous glacial erosion lakes, including the Jiajika Lake next to the Jiajika Mine and the Cuola Lake in the Cuola Project area, which can provide sufficient water for mining operations in the area. Some of the spodumene pegmatite veins are covered by the glacial sediments and became blind mineralised bodies. These blind mineralised bodies provide further exploration potential for the Cuola Project and the surrounding areas.

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The Cuola Project area is located on the western limb of the Jiajika dome-shaped anticline and near to the anticlinal core. Fault structures are generally not well developed in the area, but fractures in the north-eastern and north-western directions (X-shaped steep-dipping shear fractures) are well developed and control the distribution of the Type IV and Type V pegmatite veins in the project area. The Type I pegmatite veins are generally controlled by cooling fractures within the two-mica granite intrusive body; the Type II and Type III pegmatite veins are generally controlled by bedding fractures in the Xinduqiao Formation schists near the intrusive contact. The Type IV spodumene pegmatite veins are generally controlled by the steep-dipping north-eastern and north-western fractures, located at the upper portion of  $T_3xd^{1-1}$  and lower portion of  $T_3xd^{1-2}$ , slightly away from the intrusive contact in the Cuola Project area.

The Jiajika Granite intruded into the southwest portion of the Jiajika dome-shaped anticline core. The erosion depth is relatively shallow and only the fine-grained boundary phase rock is exposed. The rock consists of mostly microcline, albite-oligoclase and quartz with smaller amounts of muscovite and biotite and trace amounts of tournaline, apatite, spodumene, garnet, zircon, titanite, rutile, diopside, epidote, hornblende, pyrite, magnetite, ilmenite and molybdenite. The rock is high in silica (more than 70%), low in Ca, Mg and Fe, and rich in rare metals and volatile elements, with Li content up to 0.06-0.15%.

The pegmatite veins in the Cuola Project area are believed to be the product of crystallization differentiation of the Jiajika Granite. Different types of pegmatite veins are distributed in concentric zones surrounding the granite intrusion with Type I microcline pegmatite veins generally within the intrusive body, Type II microcline-albite pegmatite veins and Type III albite pegmatite veins in schists near the intrusive contact zone, and Type IV spodumene pegmatite veins, Type V muscovite pegmatite veins and quartz veins further out from the contact zone. The pegmatite veins generally have similar chemical composition as the granite, with higher rare-metal and volatile contents, indicating that the pegmatite veins and the granite might have developed from the same magma source.

Geophysically, the apparent polarisability of pegmatite and schist in the area does not differ significantly, but the resistivity of the two rock types is sufficiently different (high for pegmatite and low for schist) that resistivity survey results can be used as a general guide for exploration of the pegmatite veins at depth and underneath the Quaternary glacial sediments.

#### **Geology of Spodumene Pegmatite Veins**

A total of 148 pegmatite veins have been identified within the Cuola Project exploration license area by the No.108 Brigade, of which 20 are Type IV spodumene pegmatite veins.

The relatively large No.632, No.602, No.603, No.593 and No.60 pegmatite veins and No.594 pegmatite vein group occur in the west portion of the Jiajika District, around the Cuola Lake, at a distance of 2,000-3,000m from the Jiajika Granite intrusion; these spodumene pegmatite veins form the West Section of the Jiajika District.

The No.104 vein is located south of the Jiajika Lake and east of the Jiajika Granite at a distance of about 70m from the intrusive contact; this pegmatite vein is part of the Central Section of the Jiajika District.

The No.668 vein is located at the outer contact zone southeast of the Jiajika Granite at a distance of 600-700m from the contact. It is parallel to the intrusive contact and is an important spodumene pegmatite vein in the South Section of the Jiajika District.

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Other smaller spodumene pegmatite veins identified by the No.108 Brigade are mostly located within the West Section of the Jiajika District.

The spodumene pegmatite veins occur as single veins or vein groups. Individual spodumene pegmatite veins can be shaped as regular or irregular veins or lenses, beaded veins, branching and composite veins and tuberculiform veins. They generally infill fractures in the schists and are 2-35m wide and 85-760m long. The pegmatite veins generally dip to the west and northwest; but some of the veins also dip to the east, southeast and south. The veins generally have a high dip angle, but this varies along the dip direction and is locally overturned. The larger spodumene pegmatite veins in the Cuola Project area include the No.632, No.594 (separated into No.594W, No.594M and No.594E), No.60, No.602, No.603, No.593, No.668 and No.104 veins. Table 5.1 shows the characteristics of the main spodumene pegmatite veins.

## Table 5.1

#### Characteristics of the Main Spodumene Pegmatite Veins of the Cuola Project

Pegmatite Vein	Shape	Length (m)	Width (m)
No.632	regular vein	750	3.0-30.5
No.594E	branching vein	332	3.3-26.2
No.594M	branching vein	195	2.4-17.4
No.594W	lenticular	258	1.4-20.3
No.60	irregular vein	412	1.3-22.9
No.602	branching vein	565	0.8-59.4
No.603	irregular vein	217	3-18
No.593	irregular vein	305	1.1-34.0
No.668	regular vein	960	2-98
No.104	lenticular vein	496	3-12

The Type IV spodumene pegmatite veins generally consist of 35-40% quartz, approximately 5% microcline, 35% albite, 10-20% spodumene, and 2-3% muscovite, with minor amounts of accessory minerals such as garnet, pyrite, aphrizite, apatite, and cassiterite. Spodumene is generally gray or grayish white, occasionally light green in color. Its shape is platy, plate-columnar or acicular. The mineral generally occurs as fine crystals (1-4cm long and 0.2-0.5cm wide) with small amounts of smaller and larger crystals. The spodumene crystals generally occur perpendicular to the pegmatite vein walls with small amount at an angle to the walls.

Based on sampling and analysis results, the average Li<sub>2</sub>O grade of the Type IV spodumene pegmatite veins ranges from 1.21% to 1.47% Li<sub>2</sub>O. These veins also contain some beryllium, niobium, tantalum and tin, but the grades are generally not high enough to warrant economic recovery at current technical and economic conditions. The Li<sub>2</sub>O grade in the pegmatite veins is generally stable, but it can decrease to below the Mineral Resource estimation cut-off grade of 0.5% Li<sub>2</sub>O towards the ends of the veins along strike. There is commonly a thin low grade shell at the contact with the schist wall rock. The Li<sub>2</sub>O grade also often decreases to below cut-off grade at depth.

For each individual spodumene pegmatite vein, at the schist-wall rock contact, there is commonly a 3-5cm wide fine-grained greisenisation zone (consisting of mostly quartz, muscovite and a small amount of feldspar) with very low lithium grade, followed by a 0.5-5m wide fine-grained pegmatite zone (consisting of mostly quartz, feldspar and a small amount of muscovite) with a low

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lithium grade. The middle zone of the vein is generally the fine- to medium-grained quartz-albitespodumene pegmatite with a small amount of muscovite and tourmaline and good lithium grade.

The following are the characteristics of some of the main mineralised pegmatite veins.

The No.632 pegmatite vein is located at the western portion of the Cuola Project area. It is a single regularly-shaped vein with a strike direction of N30°E, a surface strike length of approximately 750m and a width of 3.0m to 30.5m. The vein has a steep dip to the southeast, but it is locally overturned. There are 16 surface trenches and 18 drill holes completed, of which 11 trenches and 15 holes have intersected the pegmatite vein. The maximum explored depth of the vein is approximately 180m. The vein is thick in the middle and pinches out at both ends on the surface. The mineralised middle zone of the pegmatite vein with Li<sub>2</sub>O grade above 0.5% is approximately 690m long, 0.5-30.5m wide with an average of 11.8m, and 60-120m deep. Its thickness and lithium grade are generally consistent with Li<sub>2</sub>O grade ranging from 0.58% to 2.27%, averaging 1.14% Li<sub>2</sub>O (Figures 25 and 26).

The No.602 spodumene pegmatite vein is located south of the Cuola Lake with a nearly northsouth strike. It is a lenticular vein with some branching in the middle; part of the vein in the middle section is not exposed at surface. The vein is approximately 565m long and 0.8-59.4m wide, averaging 15.5m; it dips steeply to the west with an average angle of 79° and is locally overturned; its down-dip length ranges from 73m to 377m. The spodumene pegmatite vein is almost entirely mineralised with a total of 11 surface trenches and 42 drill holes intersecting the mineralised zone. The vein is thick in the middle and pinches at both ends. The mineralised middle zone of the pegmatite vein with Li<sub>2</sub>O grade above 0.5% has a Li<sub>2</sub>O grade from 0.58% to 1.71%, averaging 1.46% Li<sub>2</sub>O (Figures 26 and 28).

The No.593 spodumene pegmatite vein occurs east of the No.602 pegmatite vein with a strike of N73°E. The vein is controlled by two nearly parallel fractures. It dips to the southeast with a shallow dip near surface and steeper dip at depth. It is a branching vein, approximately 305m long and 1.1-34.0m wide, averaging 14.6m; its down-dip length ranges from 80m to 135m. The vein is almost entirely mineralised. A total of 10 surface trenches and 14 drill holes have been completed, of which 10 trenches and 12 drill holes intersected the mineralised zone of the vein. The mineralised middle zone of the pegmatite vein with Li<sub>2</sub>O grade above 0.5% has a Li<sub>2</sub>O grade from 0.53% to 1.54%, averaging 1.18% Li<sub>2</sub>O.

The No.594 vein is a spodumene pegmatite vein group, consisting of three sub-parallel veins (No.594E, No.594M and No.594W) located southeast of the Cuola Lake. The veins strike north-south or NNE and dip to the west at steep angles. They are relatively regular veins with some branching at the ends. There is a total of 15 surface trenches and 13 drill holes completed for the No.594 vein group and only two holes did not intersect the pegmatite veins. The mineralised zone of the No.594E vein is 332m long, 3.3-26.2m wide, averaging 11.9m, with a maximum depth of approximately 80m; the mineralised zone of the No.594M vein is 195m long, 2.4-17.4m wide, averaging 8.6m, with a down-dip length of 120m; the mineralised zone of the No.594W is 258m long and 1.4-20.3m wide, averaging 7.3m, with a down-dip length of 75m. Average Li<sub>2</sub>O grade is 1.02% for No.594E, 1.22% for No.594M and 1.16% for No.594W.

## Conclusions

BDA considers the Cuola Project geology and mineralisation to be generally straightforward, and reasonably well defined and understood based on systematic detailed exploration work completed

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to date. The clear distinction between schist wall rock and lithium-bearing pegmatite veins makes the exploration and mining work relatively easy as the mineralization and waste can be readily identified by the naked eye.

## 5.3 Exploration, Geological and Resource Data

## Exploration

The exploration work completed in the 1960s and 1970s by the No.404 Brigade is considered not reliable because of the limitation of technologies for drilling, sampling and sample analysis at that time. The geological database used for current Mineral Resource estimation was all generated by systematic detailed exploration work completed from 2009 to 2011 by the No.108 Brigade.

The No.108 Brigade completed a 1:10,000 scale surface geological map for the entire Cuola Project exploration license area; they also completed a more detailed 1:2,000 scale geological map for the north-western portion of the Cuola Project exploration license area, where the majority of the Type IV spodumene pegmatite veins are located. The topography was also resurveyed in detail and all geological mapping, drilling and trenching activities were conducted based on the new topographic maps.

Surface trenching and drilling was conducted along exploration lines approximately perpendicular to the pegmatite vein strike designed for each individual pegmatite vein or vein group. The exploration line spacing is 80m for the larger and more regularly-shaped No.632 pegmatite vein and 40m for other smaller and/or less regularly-shaped pegmatite veins or vein groups. A total of 142 diamond drill holes with a total drilled length of 17,575m and a total of 136 surface trenches with a total excavated volume of 28,407m<sup>3</sup> were completed during the period, of which 132 drill holes and 125 trenches intercepted the spodumene pegmatite veins. Drill hole and trench spacing on cross sections were generally 20m to 60m.

The No.108 Brigade has also completed some geophysical surveys in order to geophysically characterise the spodumene pegmatite veins and provide a guide for locating possible blind pegmatite veins covered by the Quaternary glacial sediments. Geotechnical, hydrogeological, and environmental geology studies have also been carried out in order to collect basic data for mine planning and project development.

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Cuola Lithium Project

Figure 26 804-201 (03) November 2021 No.602 VEIN GROUP AREA Behre Dolbear Australia Pty Ltd

**GEOLOGY OF THE No.632 VEIN AND** 

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CROSS SECTION OF No.632 PEGMATITE VEIN ON EXPLORATION LINE 15

Figure 27 804-201 (03) November 2021

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#### **Geological Data Acquisition**

The database used for resource estimation of the Cuola Project consists of 7,490 samples collected from 6,668m of sampled drill cores and 1,890m of sampled surface trenches. In general, only the pegmatite intercepts were sampled for grade analysis.

Diamond core drilling was conducted by Chinese made drill rigs. The drill hole size is mostly 75mm in diameter with a recovered drill core size of 56mm, which is considered a reasonable core size to collect a good sample for grade analysis. Core recoveries were generally reasonably good, with a range from 80.3% to 99.8%, averaging 91.7%, for the entire hole and a range of 82.1% to 100.0%, averaging 92.3%, for the pegmatite intervals.

Drill core for each hole was logged by a geologist on site. Drilled length, drill core length, remaining unrecovered core length, and core recovery for each drill run was recorded; lithology and mineralisation of the core were logged and recorded in detail. Each individual core box was photographed and the photos were kept in a digital database for future reference and verification.

Drill hole collar location was surveyed after drilling; drill hole down-hole deviation was also surveyed by a down-hole survey instrument at an interval of approximately 50m as well as at the bottom of the drill hole; drill hole length recorded by the driller was verified by actual measurement at the same time as the down-hole deviation survey. The drill holes were generally backfilled after drilling and the drill hole collar location was marked by a cement hole monument at the surface.

BDA notes that because of the limitation of drill rigs used for the exploration work by the No.108 Brigade, most of the holes were drilled at an angle of 80°, which is less than ideal for the generally steep-dipping spodumene pegmatite veins in the Cuola Project as the location and thickness of the veins may not be determined accurately when the intersection angle of drill hole with the pegmatite veins is relatively small.

The drill hole collar location and down hole deviation have been accurately surveyed and the down hole deviation survey results generally show that the drill hole dip at various depths is consistent with the original designed drilling angle; the pegmatite veins are generally several meters to several tens of meters wide; these thicknesses can partially compensate for the effect of the relatively small intersection angle. BDA recommends the use of more modern drill rigs capable of drilling lower angles for any further drilling for the Cuola Project.

The surface trenches were dug by excavators (about 80%) or by hand (about 20%). The trenches were generally dug to the depth of the fresh bedrock to reveal the contact of pegmatite veins with schist wall rocks. Each trench was mapped in detail at a scale of 1:100; geology and mineralisation in the trench were recorded in detail. Trench locations were surveyed.

## Sampling, Sample Preparation and Analysis

Sampling has followed accepted industry practice in China.

Diamond drill core sample intervals were determined by the geologist logging the core, generally for all the pegmatite intercepts. Sampling length varies from 0.5m to 2.0m, averaging around 1m, honoring the geology. Core samples were collected by a mechanical core splitter by splitting the core in the middle to separate the core into two halves. One half of the core was collected for grade analysis, and the other half was stored in the original core box for future verification, check sampling, metallurgical test sampling, and any other relevant studies.
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Channel samples from the surface trenches were collected generally from the trench bottom; sample channels were generally 10cm wide and 5cm deep; sample interval was generally 1-2m, honoring the geology.

A total of 7,490 samples were trucked by the No.108 Brigade to the primary analytical laboratory, the West-South Metallurgical Geology Analytical and Test Center ("West-South Test Center") located in Pi County, Sichuan Province, which is authenticated in metrology by Certification and Accreditation Administration of China and also holds a Class A qualification certificate issued by the Land and Resource Ministry of China, for grade analysis.

Sample preparation was conducted by the West-South Test Center. All samples were crushed, ground and split according to a standard procedure. A 50g pulp sample was produced for grade analysis. A duplicate pulp sample and the coarse rejects were sent back to Tianqi Shenghe for future verification grade analysis and metallurgical testing work.

Samples were dissolved by a mixture of nitric acid, hydrofluoric acid and perchloric acid, and were analyzed by the Inductively Coupled Plasma-Atomic Emission Spectrometry ("ICP-AES") method for  $Li_2O$ ,  $Nb_2O_5$ ,  $Ta_2O_5$ , and BeO. Each sample was also analyzed for Sn by the oscillopolarography method.

### **Assay Quality Control**

Quality assurance/quality control (QA/QC) for sample analysis was carried out by internal check analysis (duplicate sample analysis by the original analytical laboratory), external check analysis (check sample analysis by an independent secondary analytical laboratory) and inserting analytical standards in each batch of the samples.

Three blind standard samples were included in each butch of 10 samples to monitor the accuracy of the analytic results. The analytical results of the standards show the analyzes are within an acceptable variation range of the standard sample grades.

A total of 311 samples, or about 4.2% of the total number of analyzed samples, were randomly selected for internal check analysis. The internal check samples have different sample numbers from the original sample number and the analysis was conducted by a different operator. The analytical results of more than 99.5% of the check samples are within an acceptable variation range of the analytical results of the original samples.

A total of 229 samples, or about 3.1% of the total number of analyzed samples, with high, medium or low grades, were selected from the duplicate pulp samples for external check analysis. The external check analytical laboratory used by the No.108 Brigade was the Analytical and Test Center of the Bureau of Geology and Mineral Resource Exploration and Development of Sichuan Province in Chengdu, Sichuan, which is authenticated in metrology by Certification and Accreditation Administration of China, in 2009 and 2010, and the Analytical and Test Center of the Institute of Multipurpose Utilization of Mineral Resources of Chinese Academy of Geological Sciences in Chengdu, Sichuan, which is International Organization for Standardization, ISO:9001 authenticated, in 2011. The average Li<sub>2</sub>O grade of 0.8968% for the external check samples is very close to the average Li<sub>2</sub>O grade of 0.8998% for the original samples; approximately 95% of the check sample Li<sub>2</sub>O grades are within the acceptable variation range of the original sample Li<sub>2</sub>O grades.

In order to independently verify the reliability of Tianqi Shenghe's sample Li<sub>2</sub>O grade, BDA took 20 randomly-selected check samples from the duplicate pulp samples from Tianqi Shenghe's warehouse. These samples were given new BDA sample numbers and were submitted to the West-South Test Center for Li<sub>2</sub>O grade analysis. Analytical results show that the average Li<sub>2</sub>O grade of the BDA check samples is 0.933%, which is only approximately 1% below the average Li<sub>2</sub>O grade of the original samples of 0.942%. Figure 29 is a scatter plot comparing the BDA check sample grade and the original sample grade. BDA considers that the BDA check samples generally confirm the original sample grades.

The QA/QC data shows that the  $Li_2O$  analytical results for the Cuola Project are of good quality and are appropriate for mineral resource estimation.

# **Bulk Density**

A total of 238 spodumene pegmatite bulk density measurement samples were collected from drill cores and surface trenches by the No.108 Brigade for the Cuola Project. Bulk density of the samples was determined by the wax-coating, water-immersion method. The measurement results show that the bulk density ranges from  $2.5t/m^3$  to  $2.8t/m^3$ , with an average of  $2.71t/m^3$ . The measurement results also show the bulk density of the spodumene pegmatite is slightly positively correlated with the sample Li<sub>2</sub>O grades.

Based on the measurement results, the average bulk density is 2.68t/m<sup>3</sup> for the No.632 pegmatite vein (37 samples), 2.73t/m<sup>3</sup> for the No.602 vein (50 samples), 2.71t/m<sup>3</sup> for the No.594 vein (52 samples), and 2.68t/m<sup>3</sup> for the No.668 vein (35 samples). The average bulk density of these veins was used for mineral resource estimation for each of the veins. For other spodumene pegmatite veins without sufficient number of bulk density measurements, the average density of 2.71t/m<sup>3</sup> for all the spodumene pegmatite vein samples for the entire Cuola Project area was used for resource estimation. BDA considers these bulk densities are reasonable considering the mineralogy of the spodumene pegmatite in the Cuola Project area.

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Figure 29 Scatter Plot Comparing BDA Check Samples with Original Samples

# **Independent Due Diligence Performed by BDA**

In order to verify the reliability of the Cuola Project Mineral Resource estimates, BDA performed some independent due diligence checks in the process of preparing this CPR.

A site visit was conducted by BDA's Project Geologist and Competent Person to the Cuola Project in Yajiang County Sichuan Province and to the head office of Tianqi Shenghe in Chengdu, Sichuan.

During the visit to the Cuola Project, BDA selectively checked the surface geology, located some of the drill holes and surface sample trenches for some of the primary spodumene pegmatite veins. BDA inspected the core storage facility and checked the stored core for some of the drill holes. BDA also visited the incomplete construction work at the project site.

In Tianqi Shenghe's head office in Chengdu, BDA discussed the Cuola Project with Tianqi Shenghe's management and technical staff, interviewed the primary technical staff of the No.108 Brigade involved in the 2009-2011 Cuola Project exploration work and confirmed that the No.108 Brigade did complete the exploration work described in their exploration geology report.

BDA also reviewed all the drill hole logs, photographs for all the drill core, analytical certificates for all the analytic samples, the No.108 Brigade exploration geology report with Mineral Resource estimation and all the attached maps and tables.

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BDA took 20 check samples from duplicate pulp samples in Tianqi Shenghe's warehouse and analyzed the  $Li_2O$  grade for these samples in order to independently verify the reliability of the original sample  $Li_2O$  grade (Figure 28).

BDA also reviewed the No.108 Brigade's Mineral Resource estimation procedure and checked some of the calculation results.

All BDA's independent due diligence work indicates that the exploration work conducted by the No.108 Brigade was generally conducted according to industry standards; the database generated from the exploration work is considered generally appropriate for Mineral Resource estimation; BDA considers that the Mineral Resource estimation was generally completed in an acceptable manner under the JORC Code.

### Conclusions

BDA has not undertaken a detailed audit of the geological and analytical data as part of this review. However, BDA has reviewed data acquisition, quality control procedures and QA/QC results presented by the No.108 Brigade and also performed some independent due diligence checks on the database and resource estimation. BDA concludes that the database quality is appropriate and adequate for estimation of Mineral Resources and Ore Reserves under the JORC Code.

BDA notes that most of drill holes were drilled at an inclined angle of 80° because of the limitation of the drill rigs used for the Cuola Project; this is less than ideal for the steeply-dipping pegmatite veins in the Cuola Project as the small interception angle between drill holes and the pegmatite vein may not accurately determine the location and the true thickness of the mineralisation. The No.108 Brigade surveyed the collar location and down hole deviation of all the drill holes and the down hole deviation measurement results show that the actual drill hole dips at depth are generally close to the originally designed drill angles. Also, the spodumene pegmatite veins are generally several meters to several tens of meters wide. All these factors can partially offset the effect of the high drill hole angle. BDA recommends that all the future drilling for the Cuola Project should be conducted using more advanced drill rigs with the capability of drilling lower angle holes.

# 5.4 Mineral Resources and Ore Reserve Estimation

#### **Mineral Resource Estimation Procedures and Parameters**

In China, the methods used to estimate Mineral Resources and the parameters used to categorize the Mineral Resources for a particular type of mineral deposit are generally prescribed by the relevant Chinese government authorities. The Mineral Resource estimates are based on strictly defined parameters, which include minimum grades and minimum thicknesses. The Mineral Resources for a deposit are generally estimated by an independent engineering entity with a government-issued license.

Current Mineral Resource estimation for the Cuola Project was completed by the No.108 Brigade as the most important part of its exploration work for the project from 2009 to 2011. The exploration work with Mineral Resource estimate was summarized in the report "Exploration Geology Report of the Cuola Spodumene Mining District in Yajiang County, Sichuan Province" dated September 22, 2011. As there has been no additional exploration work and no mining activities since completion of the report, the Mineral Resource for the Cuola Project remains the same at the effective date of this BDA CPR.

The drill hole and/or channel sampling density required to define a certain class of Mineral Resource depends on the type of deposit. Based on the mineralised body size and complexity, under Chinese procedures a deposit is classified into certain exploration types before Mineral Resource estimation. The No.632 pegmatite vein is a relatively large, regularly-shaped single vein with a controlled length of 750m with good continuity in both grade and thickness, therefore, it was categorized as exploration type II. All other pegmatite veins are smaller and less regular in shape compared with the No.632 vein but still have good grade continuity and reasonable thickness continuity, these veins are categorized as type II-III and type III.

For the purpose of Mineral Resource estimation, all drilling and sampling data, along with other relevant geological information, were digitized into the MAPGIS software system by the No.108 Brigade. MAPGIS is a computer software system widely used in China for preparation of plans and sections for Mineral Resource estimation. Sections and plans used for the September 2011 Mineral Resource of the Cuola Project were produced by MAPGIS.

The parallel section method, a polygonal method based on projected cross sections, was used for the Mineral Resource estimation of the larger, more important spodumene pegmatite veins in the Cuola Project by the No.108 Brigade. Mineral Resource estimation for other smaller and/or less important veins was estimated by the polygonal method on projected long sections. Based on information provided by the No.108 Brigade and discussions with the No.108 Brigade technical personnel, the general procedures and parameters used in the Mineral Resource estimation of the larger, more important pegmatite veins are described as follows.

### **Determination of "Deposit Industrial Parameters"**

The economic parameters for mineral resource estimation are referred to as "deposit industrial parameters" ("DIP") in Chinese literature or technical reports and are normally approved by government authorities for each deposit or based on the government's industry specification. These parameters generally include the cut-off grades (separated into boundary cut-off grade and block cut-off grade), minimum mining width, and minimum waste exclusion width. The DIPs used for the mineral resource estimates of the spodumene pegmatite veins in the Cuola Project reviewed in this report are summarized as follows:

Boundary Cut-off Grade:	$0.5\% \ Li_2O$
Block Cut-off Grade:	0.7% Li <sub>2</sub> O
Deposit Cut-off Grade:	1.0% Li <sub>2</sub> O
Minimum Mining Width:	1m
Minimum Waste Exclusion Width:	2m

BDA notes that the boundary cut-off grade of 0.5% Li<sub>2</sub>O used by the No.108 Brigade is the same as the reporting cut-off used by Talison for the Mineral Resource estimate for the Greenbushes Mine in Australia, indicating the boundary cut-off used for the Cuola Project is generally reasonable for Mineral Resource estimates under the JORC Code.

### **Determination of Block Boundaries and Confidence Level**

In the parallel section Mineral Resource estimation, the mineralised body on a cross section was separated into a number of blocks, with each block assigned a Mineral Resource confidence level based on the type, density and quality of available geological data. For the No.632 pegmatite vein, a

Measured Mineral Resource block was defined by surface drilling and surface trench channel sampling, with a data spacing of no more than  $80m \times 40-60m$ . An Indicated block is defined by a drill hole/channel spacing of no more than  $160m \times 60-80m$ . No extrapolation is allowed from a data point for the Measured and Indicated Mineral Resource blocks. An Inferred Mineral Resource block is generally defined by a wider drill hole spacing or extrapolated 40m from the Measured/Indicated Mineral Resource blocks. Figure 30 shows the Mineral Resource classification on a projected long section for the No.632 pegmatite vein in the Cuola Project.

For other pegmatite veins with an exploration type II-III or III, a Measured Mineral Resource block is defined by surface drilling and surface trench channel sampling, with a data spacing of no more than  $40m \times 15$ -20m. An Indicated block is defined by a drill hole/channel spacing of no more than  $80m \times 30$ -40m. No extrapolation is allowed from a data point for the Measured and Indicated Mineral Resource blocks. An Inferred Mineral Resource block is generally defined by a wider drill holes spacing or extrapolated no more than 40m from the Measured/Indicated Mineral Resource blocks. Figure 31 shows the Mineral Resource classification on a projected long section for the No.602 pegmatite vein in the Cuola Project by the No.108 Brigade.

### **Mineral Resource Estimation**

In the Mineral Resource estimation process, the corresponding two-dimensional blocks on two neighboring parallel cross sections were used to define a three-dimensional block. The area of the three-dimensional block (S) is calculated from the areas of the two-dimensional blocks on the two cross sections ( $S_1$  and  $S_2$ ). When the area difference for the two blocks on cross sections is less than 40%, the following trapezoid formula is used for the three-dimensional block area calculation:

$$S = \frac{S_1 + S_2}{2}$$

When the area difference for the two blocks on cross sections is more than 40%, the following frustum formula is used for the three-dimensional block area calculation:

$$S = \frac{S_1 + S_2 + \sqrt{S_1 \times S_2}}{3}$$

When a block on a cross section pinches out, the three-dimensional block area is half the twodimensional block area if the block pinches out to a line or one third of the two-dimensional block area if the block pinches out to a point.

The volume of the three-dimensional block is determined by multiplying the area (S) with the sectional distance (L). The block mineral resource tonnage is determined by multiplying the volume by the average bulk density of the pegmatite vein. The mineralised body and deposit tonnages are based on the sum of the block tonnages.

Average drill hole or channel sample  $Li_2O$  grades were calculated using the length-weighted average of all the drill hole or channel samples within the block boundary. The block average grade is calculated using the length-weighted average of all drill hole or channel intersections inside the block. The mineralised body grade is calculated using the tonnage-weighted average of all blocks inside the mineralised body. The deposit grade is calculated using the tonnage weighted average of all the mineralised body.

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LONG SECTION PROJECTION OF BLOCK MINERAL RESOURCE CLASSIFICATION Figure 30 FOR THE No.632 PEGMATITE VEIN Behre Dolbear Australia Pty Ltd

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Based on our review, BDA considers the Mineral Resource estimation procedures and parameters applied by the No.108 Brigade for the Cuola Project to be generally reasonable and appropriate. The deposits are relatively large spodumene pegmatite veins or vein groups generally with

good or reasonable spatial and grade continuity. The Measured blocks were defined by drill holes and surface trench channel samples at a data spacing of no more than  $80m \times 40-60m$  (type II, the No.632 vein only) or  $40m \times 15-20m$  (type II-III or III) and have a relatively high level of geological control. The Indicated Mineral Resource category blocks were also reasonably defined based on drill holes and surface trench channel samples at a data spacing of no more than  $160m \times 60-80m$  (type II, the No.632 vein only) or  $80m \times 30-40m$  (type II-III or III). There was no extrapolation from data points for the Measured and Indicated Mineral Resource category blocks. The Inferred Mineral Resource category blocks were defined by wider-spaced sampling or by limited extrapolation from Measured and Indicated Mineral Resource blocks.

BDA considers that traditional parallel section method and polygonal method are acceptable Mineral Resource estimation methods under the JORC Code although the estimation results may be difficult to be used directly for further Ore Reserve estimation and mine planning, especially for an open-pit mining operation. Tianqi Shenghe will need to convert the parallel section/polygonal Mineral Resource model to a three-dimensional computer block model in order to conduct Ore Reserve estimation and mine planning, especially for an open-pit mining operation.

As the Cuola Project is still at the development stage. No actual production data is available for reconciliation of the actual mine production with the Mineral Resource estimation.

As discussed previously, the surface drill holes were mostly drilled at a high angle of 80°, which is less than ideal for the steep-dipping spodumene pegmatite veins in the Cuola Project, as the thickness and location of the veins may not be determined accurately. Because of this limitation, plus the fact that some of the drill hole spacing for the No.108 Brigade's Measured Mineral Resource blocks is relatively wide, BDA considers the Measured Mineral Resource blocks would be more appropriately classified as Indicated Mineral Resource. For the purposes of this CPR, BDA has therefore reduced the confidence level of all the Measured Mineral Resource blocks in the No.108 Brigade resource estimation and has reclassified them as Indicated Mineral Resources.

Based on its detailed review of the deposit geology, drilling and sampling data, and procedures and parameters used for the estimation of mineral resources, BDA is of the opinion that the Mineral Resources estimated by the No.108 Brigade under the 1999 Chinese mineral resource system for the Cuola Project, after reclassifying the Measured Mineral Resource to Indicated Mineral Resource, conforms appropriately to the equivalent JORC Mineral Resource categories. The economic portion of the Indicated Mineral Resource can accordingly be used to estimate the Probable Ore Reserves for the Cuola Project. As BDA has worked closely with Tianqi Shenghe to ensure the Mineral Resource estimates meet the JORC Code 2012 edition requirements and has modified the Mineral Resource estimates produced by the No.108 Brigade, BDA considers that its Competent Person for the Cuola Project has supervised the Mineral Resource estimation and can sign-off the Mineral Resource estimates for the project; Dr. Qingping Deng, a director of BDA<sup>5</sup>, is the Competent Person for the Cuola Mineral Resource. The JORC Code 2012 Edition Table 1 for the Cuola Project for the Mineral Resource estimates of the Cuola Project is appended to this CPR.

<sup>&</sup>lt;sup>5</sup> Qingping Deng is a Certified Professional Geologist of American Institute of Professional Geologists (a Recognised Professional Organisation under JORC Code), (Membership number 10515).

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#### **Mineral Resource Statement**

The Mineral Resource estimates under the JORC Code as of December 31, 2021 for the Cuola Project, as signed-off by BDA, are summarized in Table 5.2. The Mineral Resource estimated by the No.108 Brigade for the Cuola Project were dated September 22, 2011. As there have been no additional exploration and/or mining activities for the property since the No.108 Brigade resource estimation, the Mineral Resources as of December 31, 2021 remains the same as that on September 22, 2011. BDA considers that under the JORC Code both the Measured and Indicated Mineral Resource blocks defined by the No 108 Brigade should be categorized as Indicated Mineral Resource. The Mineral Resource estimates are inclusive of mineralisation potentially comprising the Ore Reserves.

# Table 5.2

# Cuola Project Mineral Resources as of December 31, 2021

Mineral Resource Category	Tonnage (Mt)	Li <sub>2</sub> O%	Li <sub>2</sub> O (kt)	LCE (kt)
Indicated Mineral Resources	14.2	1.3	186	461
Inferred Mineral Resources	5.5	1.3	69	171
Total Mineral Resources	19.7	1.3	256	632

Note: there may be some rounding errors in totals; a cut-off grade of 0.5% Li<sub>2</sub>O was used for reporting resources; the derivation of lithium carbonate equivalent is tons × (% Li<sub>2</sub>O/100) × 2.473 = tons LCE.

BDA notes that the No.108 Brigade also estimated grades for BeO (406ppm), Nb<sub>2</sub>O<sub>5</sub> (116ppm), and Ta<sub>2</sub>O<sub>5</sub> (49ppm) for the mineral resources in Table 5.2. These grades are sub-economic under current technical and economic conditions; therefore, no further discussion is conducted for these elements in this CPR.

# **Mineral Resource Upside Potential**

There is some additional Mineral Resource upside potential for the Cuola Project, as summarized below:

- approximately 28% of the estimated Mineral Resource is classified as Inferred; this resource can potentially be upgraded to Measured and Indicated Mineral Resource categories with additional drilling;
- some of the pegmatite veins remain open in the down dip direction; further drilling could define additional resources in these areas; and
- a large portion of the original project exploration license area was covered by Quaternary glacial sediments; there is a possibility that some of the spodumene pegmatite veins are covered by the glacial sediments and have not been discovered to date, which could provide additional targets for further exploration in the area.

# **Ore Reserve Estimation**

Tianqi Shenghe completed a feasibility study and an initial project engineering design study for the Cuola Project in 2012. BDA's preliminary review indicates that some of the methodologies and parameters used in these studies do not conform with the JORC Code requirements as the Inferred Mineral Resources were used along with the Measured and Indicated Mineral Resources for mine planning and Ore Reserve estimation and some of the economic parameters used for the studies are

now out of date. Tianqi Shenghe has not updated the feasibility study or the initial engineering design study by the date of this report and therefore, BDA considers that Ore Reserves under the JORC Code are currently not defined for the Cuola Project; and as a consequence, mining operations, processing operations, production plans, capital and operating cost of the Cuola Project have not been reviewed by BDA as part of this CPR. However, BDA believes that Ore Reserves under the JORC Code could be defined in the future if a feasibility study or an initial project engineering design study conforming with the JORC Code and based on up to date economic conditions were completed.

### Conclusions

BDA considers that Mineral Resource estimated by the No.108 Brigade using the traditional parallel section/polygonal section has generally been undertaken professionally. BDA has lowered the confidence level for the Measured Mineral Resources of the No.108 Brigade estimate principally because of the high drill hole angle. After reclassifying the Measured Mineral Resources into Indicated Mineral Resources, BDA believes that the Mineral Resource estimates for the Cuola Project as summarized above are in compliance with the JORC Code 2012 Edition. However, this Mineral Resource model produced by the No.108 Brigade may need be converted to a three-dimensional computer block model in order to conduct Ore Reserve estimation and mine planning, especially for an open-pit mining operation.

Ore Reserve estimation has not been reviewed by BDA in this CPR as the feasibility study and the initial engineering design study completed for the Cuola Project used some methods and parameters that do not conform with the JORC Code requirements. BDA believes that Ore Reserves in compliance with the JORC Code could be defined for the Cuola Project under current technical and economic conditions should a feasibility study and/or an initial engineering design study in compliance with the JORC Code be completed.

## 5.5 Mining, Processing, Development Plan and Production Schedule, etc.

Mining, processing, development plan and production schedule, capital costs and operating costs, project implementation and project economic analysis will not be reviewed in this CPR as a feasibility study or an initial engineering design study conforming with the JORC Code has not been completed by Tianqi Shenghe for the Cuola Project to date.

# 5.6 Infrastructure

Primary access to the Cuola Project site is via a dirt-and-gravel road from the east. The project site is approximately 4km from the Jiajika Mine and 37km from the town of Tagong, which is located on sealed provisional highway S215 (Figure 3). This highway connects to the national highway G318 in the south. The road distance via S215 then G318 is approximately 108km to Kangding and 477km to Chengdu. The Ganzi Prefecture government is planning to upgrade the access road from Tagong to the Jiajika District, which will significantly improve the access to the Cuola Project as well as other lithium projects in the Jiajika District.

Electricity at the Cuola Project site is currently supplied by a 10kV line connected to the Jiajika Mine substation. This power supply is sufficient for the construction of the Cuola Project, but will not be sufficient for the planned mine production. Power supply for the entire Jiajika District is being coordinated by the Ganzi Prefecture government, and it is planned that a new 110kV line will be constructed from an existing substation in Tagong. This new power line will supply sufficient

electricity for the Phase I mining operation and the planned Phase II expansion of the Cuola Project as well as the Jiajika Mine and other possible mining operations in the district.

There are several glacial erosion lakes in the Jiajika District. The Cuola Lake located north of the No.594 spodumene pegmatite vein and/or the Jiajika Lake located east of the Cuola Project area are planned to be the water sources for production and domestic water uses of the Cuola Project. The Cuola Lake has a surface area of approximately 0.12km<sup>2</sup> with a water depth of 0.3-30.5m and a static water storage volume of approximately 2.0Mm<sup>3</sup>; the Jiajika Lake has a surface area of approximately 0.20km<sup>2</sup> with a water depth of up to 15m or more, and a static water storage volume of approximately 1.5Mm<sup>3</sup>. These lakes are recharged by surface precipitation water, especially during the rainy season. Tianqi Shenghe consider that these two lakes will supply sufficient water for planned production.

# Conclusions

*The existing and proposed infrastructure is generally adequate and appropriate to support the planned mining operation.* 

### 5.7 Mineral Tenements, Taxes and Land Reclamation

### **Mineral Tenure**

Under the "Mineral Resource Law of China", all mineral resources in China are owned by the state. A mining or exploration enterprise may obtain a license for the right to conduct mining or exploration activities in a specific area during a specified period of validity. The licenses are generally extendable at the expiration of their period of validity. The renewal application should be submitted to the relevant state or local authorities at least 30 days before the expiration date of a license. To renew an exploration license, all exploration license fees must be paid and the minimum exploration expenditure should have been made for the area designated under the exploration license. To renew a mining license, all mining license fees, resource taxes, and resource compensation levy must be paid to the state for the area designated under the mining license has both horizontal limits and elevation limits, but an exploration license has only horizontal limits.

As stated previously in this CPR, Tianqi Shenghe currently holds a mining license with an area of 2.069km<sup>2</sup> for the Cuola Project with a license number of C5100002012045210124005. The license was issued by the Department of Land and Mineral Resources of Sichuan Province on April 6, 2012 and is valid until April 6, 2032; it is extendable afterwards. The license area is separated into four zones with a total of 44 inflection points that cover all the identified spodumene pegmatite veins with lithium Mineral Resources within the original exploration license boundary (Figure 23). The elevation range for the permitted mining area is from 4,100m to 4,580m. The license permits Tianqi Shenghe to conduct a mining operation at a production rate of 1.2Mtpa.

After receiving the mining license, the original exploration license held by Tianqi Shenghe for the Cuola Project was relinquished.

BDA notes that a mining license in China generally only covers the identified Mineral Resource for a mining project; mine facilities can be located inside or outside the mining license boundary, but the land used for the mine facilities will generally need to be acquired or leased before mine construction and production. This is different from most western countries such as Australia where all the mine facilities are located within the mineral tenements or miscellaneous licenses of a mining project.

BDA notes that all currently defined Mineral Resources reviewed by this CPR for the Cuola Project are contained within the limits of the above mining license.

BDA has not undertaken a legal due diligence review of the property control documents or the mining license under which the Cuola Project operates as such work is outside the scope of BDA's independent technical review. BDA has relied upon Tianqi Shenghe's advice as to the validity of the property control documents and the mining license. BDA understands that the legal due diligence review of the property control documents and the mining license has been undertaken by Tianqi's Chinese legal advisers.

# Taxes

A mining company in China is generally required to pay a resource tax based on the sales revenue of its products. The resource tax rate is commonly 5%, but is determined by the relevant government agency for each mining company and/or each mining project. As Tianqi Shenghe is not in production at this stage, the resource tax rate for spodumene concentrate produced from the Cuola Project has not been determined.

According to information provided by Tianqi Shenghe, all concentrate sales from the Cuola Project will be subject to a value added tax ("VAT") of 13%, and there is also a city-maintenance-and-construction levy of 5% of the VAT and an education levy of 3% of the VAT. The corporate income tax rate for Tianqi Shenghe is currently at 25%.

# Land Reclamation

A reclamation plan report for the Phase I 600ktpa mining operation of the Cuola Project was completed by Sichuan Changqing Land Management Company Limited in Chengdu, Sichuan in December 2013. The reclamation plan report was reviewed and approved by a panel of specialists organized by the Department of Land and Resources of Ganzi Prefecture on December 2, 2013. According to the reclamation plan report, the total disturbed area for the Phase I Cuola Project is approximately 181ha, of which approximately 47ha, which will be temporally disturbed by mining and living facilities, waste dumps, internal roads, open pits, water intake facility, will be subject to reclamation. The TSF dam and the permanent construction will not be subject to reclamation. It was estimated that the total reclamation cost for the 47ha temporally disturbed area is approximately RMB6.1M. Tianqi Shenghe has provided a reclamation guarantee to the Department of Land and Resources of Ganzi Prefecture. BDA was informed by Tianqi Shenghe that a reclamation bond was not required by the government for the Cuola Project.

#### **Conclusions**

BDA has not conducted legal due diligence on the property control documents and mining license for the Cuola Project. BDA is advised by Tianqi Shenghe that there are no material tenement issues for these documents and license. BDA has completed a review of the mining license data for the Cuola Project and finds no reason to suspect that the information provided by Tianqi Shenghe is not accurate or factual.

# 5.8 Environmental and Community Issues

BDA has not completed a systematic review of the environmental and community issues of the Cuola Project as a feasibility study and/or an initial engineering design study in compliance with the JORC Code has not been completed.

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BDA understands that an environmental impact assessment report for the Phase I 600ktpa open-pit mining operation of the Cuola Project was completed by Sichuan Academy of Environmental Protection Science in December 2012, and the Cuola Phase I open-pit mining operation project was approved by Environmental Protection Department of Sichuan Province on February 26, 2013.

BDA was informed by Tianqi Shenghe that government at various levels is supportive of the development of the Cuola Project.

The Cuola Project site is located at the south-eastern edge of the Qinghai-Tibet plateau at an elevation of over 4,000m and is in an environmentally sensitive area. It is important for Tianqi Shenghe to take appropriate measures for ecological conservation and to avoid any environmental pollution.

Tianqi Shenghe's management and staff are all aware of the importance of environmental protection and ecological conservation.

During the 2009-2011 exploration period, all exploration work, including drilling and trench excavation, were conducted in accordance with requirements of the relevant regulations. The relevant government agency was entrusted to arrange an appropriate party to conduct the reclamation work for the areas disturbed by exploration. Some of the drilling roads located within the planned open-pit limits were not reclaimed, but appropriate compensation was paid by Tianqi Shenghe.

The Cuola Project construction work in 2012-2013 was also conducted in accordance with the environmental protection plan for the construction stage and the requirements of the relevant regulations. Dust was controlled at an appropriate level by water sprinkling, and garbage was properly disposed of, generally by deep burial.

Tianqi Shenghe has maintained a close and co-operative relationship with the local community from the beginning of the project. This includes the provision of financial and other support to community groups.

However, some of the local residents are sensitive to the possible environmental effects caused by mining activities in the district. On October 13, 2013, some local residents alleged that a leak from the TSF from the neighboring Jiajika Mine resulted in an environmental incident (including a large number of dead fish) in a downstream river. Some of the local residents demanded that the operation of the Jiajika Mine be shut down. In order to maintain the safety of property and personnel, the Department of Land and Resources of the local Ganzi Prefecture issued a directive on October 16, 2013 to suspend all activities at lithium projects in the Jiajika District including the mine production activities of the Jiajika Mine, all the construction activities of the Cuola Project and all the exploration activities of another third party. It was reported that a further similar environmental incident related to the Jiajika Mine occurred on May 4, 2016. Regulatory approval to recommence construction/ production was granted for the lithium operations in the Jiajika District in 2019.

The 2013 Directive from the Department of Land and Resources of the Ganzi Prefecture resulted in the suspension of all construction activities for the Cuola Project, and all ordered equipment was returned to the manufacturers after paying some penalties in accordance with the purchase contracts. Since that time, Tianqi Shenghe has only kept a few company employees and police station personnel on site to maintain the safety of properties and personnel. Only limited domestic garbage is generated in this stage and it has all been properly disposed. Tianqi Shenghe is currently in discussion internally when and how it should resume the construction of the Cuola Project.

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#### Conclusions

Tianqi Shenghe obtained the necessary environmental approvals to construct the Phase I 600ktpa mining operation of the Cuola Project, and is sensitive to the requirements to protect the environment and maintain a good relationship with the local residents. However, alleged environmental incidents related to an adjacent third-party mining property have resulted in the cessation of construction activities. Regulatory approval to recommence construction for the Cuola Project was granted in 2019, and Tianqi Shenghe is currently in discussion internally when and how to resume the construction of the Cuola Project. BDA considers that environment and community issues will be key area of focus for the resumption of activities at the Cuola Project.

# 6.0 RISK SUMMARY

#### 6.1 **Project Risk Summary**

When compared with many industrial and commercial operations, mining is a relatively high risk business. Each orebody is unique. The nature of the orebody, the occurrence and grade of the ore, and its behavior during mining and processing can never be wholly predicted.

Estimations of the tons and grade of a deposit are not precise calculations but are based on interpretation and on samples from drilling which, even at close drill hole spacing, remain a very small sample of the whole orebody. There is always a potential error in the projection of drill hole data when estimating the tons and grade of the surrounding rock. Even with close-spaced drilling, significant variations may occur. Comprehensive metallurgical testwork can reduce the processing risks, but the questions of representivity and scale-up remain. Estimations of project capital and operating costs have variable levels of accuracy, depending on the status of the estimates, as reflected in the sensitivities applied to the financial models. Mining project revenues are subject to variations in commodity prices and exchange rates.

# 6.2 Greenbushes Mine

The Talison Greenbushes lithium project is an established operation, and thus many of these risks are moderated by historical and ongoing experience. Nevertheless, mining will proceed to greater depths and significant expansions in throughput and concentrate output are planned. BDA has considered areas where there is perceived technical risk to the operation, particularly where the risk component could materially impact the projected cashflows. The assessment is necessarily subjective and qualitative. Risk has been classified from low through to high. In the following section, BDA has considered factors which may ameliorate some of these risks.

Risk Component	Comments							
Mineral Resources/Ore Reserves	At Greenbushes the bulk of the Mineral Resource drilling grid is							
Low to Medium Risk	irregular, varying from approximately 25 x 25m to 50 x 50m,							
Mineral Resources/Ore Reserves	although additional grade control drilling has been incorporated.							
(Continued)	This spacing is relatively wide for detailed definition of the							
Low to Medium Risk	mineralisation at the highest confidence level, and accordingly, the							
	in-situ resources have been classified as Indicated and Inferred							
	Mineral Resources, which BDA considers appropriate.							
	Sample data is based on both diamond and RC percussion drilling.							
	Although the audit trail is incomplete for older data, BDA							

**Risk Component** 

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Comments

considers that the data quality is generally good, and that the geology and mineralisation controls are well understood. There is an indication that RC drilling at Kapanga may be biased in favor of higher  $Li_2O$  grades compared to diamond drilling. If confirmed, this could lead to a lowering of overall Mineral Resource and Ore Reserve grades by a small percentage, although such a bias has not been seen during mining in Central Lode to-date.

The 2021 resource model has been prepared by SRK, an independent consulting group, with input from Talison. Mineralogical and grade domains have been re-defined with the addition of recent drilling data, and these have controlled the preparation of the Mineral Resource model, outlining the principal pegmatite domains, lithium mineralisation domains, and waste zones. Ordinary Kriging Mineral Resource block models have been prepared for each of Central Lode and Kapanga, and then merged, along with a stockpile model into a single Mineral Resource model. Statistical and visual validation of the Mineral Resource models has been undertaken. Mineral Resources have been classified as Indicated or Inferred depending on a number of factors including estimation performance and the number of kriging passes required to inform each Mineral Resource block. BDA considers the Mineral Resource modeling and Mineral Resource classification approaches to be appropriate.

An open pit mineable reserve has been estimated based on Indicated Mineral Resources within the 2021 Mineral Resource model, with the resultant Ore Reserves classified as Probable, which BDA considers appropriate. No mining dilution and mining recovery figures were applied in the Ore Reserve estimate, based on reconciliation data for the last six years. Stripping ratios are low.

There is limited potential to define additional mineable Ore Reserves within extensions along strike and at depth, including known Inferred Mineral Resources and currently marginally economic Indicated Mineral Resources that are excluded from the mine plan, while other outlying prospects remain to be evaluated.

As a generalization, BDA would rarely rate Mineral Resource/Ore Reserve risk as less than low/medium. However, there is a long history of mining at Greenbushes to support the understanding of the controls and distribution of the mineralisation, and reconciliation between previous models and overall mine production over a six year period from 2015 is very close. Limited reconciliation data has been developed for the 2021 model, but an earlier (2020) version of the model appears to have performed well compared to 2017-2019 mine production. Consequently, Mineral Resource and Ore Reserve risks are both considered to be low to medium.

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#### **Risk Component**

Comments

**Open Pit Mining** In open pit mining there is commonly a risk of localized or significant pit wall failure that will reduce the quantity of ore Low/Medium Risk Open Pit Mining (Continued) available. The Greenbushes mine design has taken into account the Low/Medium Risk geotechnical consultant's recommendations and the results from ongoing geotechnical reviews. BDA considers that the mine design has been completed with a relatively conservative approach to minimize geotechnical risk which is considered low/medium. Some localized batter failures have occurred but adjustments to the batter design have reduced future risks. Talison has installed piezometers to better understand groundwater pressures and plans to extend installations as the pits deepen. There is some risk of high rainfall events affecting short term mine production. Talison has appropriate plans in place to mitigate the effects of such an event with the drain hole into the underground workings; longer term plans will be required once mining depth reaches these workings. During the planned cutbacks, ore will be sourced from various levels within the pit. There is considered to be negligible risk from seismicity. The overall risk component within the open pit operation is considered to be low/medium. Processing The ramp up of CGP2 is progressing. The design of CGP3 and 4 is Low Risk based on operating experience with CGP1 and more recently constructed CGP2. There were some initial material handling issues with CGP2 which are resolved. Lessons learnt from CGP2 should minimize risk in commissioning and ramping up CGP3 and CGP4. TG ore will continue to be processed through the dedicated TGP. Talison has over thirty years of experience in the processing of spodumene lithium ores on the site and the requirements for efficient processing of these ores are well understood. The ore is high grade and is amenable to the processes used, provided that high and low iron ores can be selectively mined and processed. Services and Utilities The power supply to site is considered secure. It is vulnerable to Low to Low/Medium Risk short term outages such as lightning strikes but disruptions have had minimal impact. The planned installation of a 132kV power line will sustain requirements for the LOM; BDA considers these risks to be low. There is a need to expand water storage by 50% to meet requirements for the expanded LOM production but it should be reasonably straightforward to obtain the appropriate approvals. IV-125

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Risk Component	Comments				
Infrastructure, Roads, Transport Low Risk Tenement and Title Low Risk	Greenbushes operations are well established in close proximity to the South Western Highway. Port access is well established although bulk shipments may be constrained by more stringent environmental regulations. No specific regulations are foreseen but maximum allowable levels of dust and noise have reduced over time. The overall infrastructure risk is considered low. BDA has not undertaken a title search or legal due diligence on the status of the tenements or regulatory approvals held by Talison. BDA is advised by Talison that there are no material tenement issues relating to title to any of Greenbushes' assets.				
	The approvals process for gaining variations to the original development approvals at Greenbushes appears relatively straightforward and all necessary approvals appear valid and appropriate for the operations. BDA can foresee no reason why future development approval applications or variations would not be forthcoming.				
Social Issues Low Risk	The main social risk area relates to local communities becoming disenchanted from impacts associated with dust, noise, traffic and other issues associated with Talison's mining activities.				
	The Greenbushes mine has a long history of operations, and the local community are generally strong supporters of continued mining. The socio-economic benefits which positively impact on the Greenbushes community are an important driver to ensuring continuing community support for mining in the area.				
Environmental Issues Low Risk	Site environmental procedures and ongoing monitoring and data collection programs continue to be well planned and implemented.				
	Based on the information provided by Talison and previous site visits, BDA considers that the strategies for environmental protection, pollution control and monitoring are appropriate for the site and current operations. The Environmental Management System (EMS) deployed at Greenbushes provides an excellent environmental management base, setting out the numerous statutory obligations, policy statements and management objectives and targets, and standard operating procedures. The Greenbushes EMS is certified under ISO 9001:2015 Quality Management System Requirements and ISO 14001:2015 Environmental Management System.				
	The strategies for environmental protection, pollution control and monitoring on-site are appropriate. Based on the mitigation measures implemented, the risk associated with the potential for off-site impacts, including noise, dust and disturbance to surrounding ecosystems, is low.				

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Risk Component	Comments
Environmental Issues (Continued) Low Risk	Although lithium levels are elevated in site water dams and some groundwater monitoring bores, eco-toxicity studies conducted by the University of Western Australia support the suggestion that substances contained in the mine effluent, even at their maximum concentrations immediately below Cowan Dam, have not had any significant ecological consequences. The understanding gained from these eco-toxicity studies provide the rationale to the agreed targets and limits for discharges from the site with the DER.
	BDA has examined the LOM Mine Closure Plan and associated cost estimation and considers it appropriate for the current LOM planning. The determination of closure costs is consistent with the LOM Business Plan.
	BDA is of the opinion that Talison has all the necessary approvals, permits and licenses required to continue operating the Greenbushes Mine.
	Talison has engaged consulting firm GHD to support Talison in gaining the necessary environmental approvals required for the expansion of the Greenbushes Lithium Mine.
Production Medium Risk	The current mine contractor has been operating at site for an extended period and planned production levels have been met but future growth in production will require a change in the size of the production units. A new long term contract is planned to be awarded in 2022 and commence in 2023 as the increased production rate is planned. There may be short falls in achieving targets during transition to higher production rates but these are expected to be short term impacts that can be made up with significant ore stockpiles planned over the majority of years.
	The increase in ore treatment rate is not considered to be high risk given that the design of the three new plants is generally based on that of the existing CGP1 unit and that Talison's procedures for ore assessment are well established.
	The proposed increases in output rely on significant expansion of lithium demand for which the Greenbushes concentrate is a feedstock. This is dependent upon increased world-wide usage of lithium batteries due to increased reliance on electric vehicles, electricity grid storage and renewable sources of energy.
Capital Cost Low/Medium Risk	The forecast cost at completion for CGP3 is based on forecasts prepared by the prospective CGP3 EPCM Contractor for that contract scope and by Talison for costs outside of the CGP3 contract scope. BDA considers the methodology and data used to prepare the forecasts to be generally reasonable.
	Forecasts for the costs of other projects in progress or approved for development are based on appropriate studies and project cost

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Risk Component	Comments
Operating Cost Low/Medium Risk	control systems. The estimate for the CGP4 expansion is based on scoping studies undertaken using experience gained on previous expansions.
	In BDA's experience, the risk of overrun in capital costs in the design and construction of resource projects, even with a standard level of contingency, is always significant and generally rated as medium. In this case, because of the previous experience of Talison, in BDA's opinion, the risk is reduced to low/medium. Major mine operating costs are contract mining costs for drill and blast and load and haul activities. Cost estimates reflect the contractual unit rates. BDA considers there is some risk of unit cost escalation particularly during expansion of production.
	Unit process operating costs are projected to remain relatively constant over the LOM with CG annual plant operating cost expenditure increasing in line with the proposed increase in production levels. BDA considers that the methodology used for the development of future processing costs is reasonable.
	Administration costs are a relatively minor proportion of total operating costs and are projected to remain relatively constant over the LOM with the unit cost reducing as the throughput increases.
	Overall operating costs are considered a low/medium risk.

# **Risk Mitigation Factors**

A number of factors tend to reduce some of the risks identified above. Principal amongst these are:

- The pegmatite geology is relatively straightforward, and the mineralisation controls are generally well understood (although individual contacts can be complex). Geological and grade information gained from mining since 1983 greatly increases confidence in the geological interpretation and Mineral Resource modeling.
- Reconciliation in tons, grade and contained metal between previous models and mine production over the last six years has been extremely close, and the 2021 model utilizes the same data (augmented by recent extension drilling) and a broadly similar methodology.
- There are known additional Mineral Resources and additional Mineral Resource potential both adjacent to the currently designed pits and elsewhere on the property, increasing the likelihood for additions to mineable Ore Reserves.
- The mining of lithium ore at Greenbushes is well established and the staff at site have substantial experience in the operation.
- The Cornwall pit north of the C3 pit has been mined to a depth of 270m and there have been no major wall failures. The C3 pit is planned to a depth of 450m and wall slopes are planned to be similar to the existing pit.

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- The increase in production is based on construction of three plants each of which is similar in design to the existing CGP1, which has an established production record, having been commissioned in 2012. Changes in the flow sheet and plant design are relatively minor and are based on improvements identified with the CGP1 design.
- The operation has developed a history of successful application of new technologies in the processing area with the optimisation of the coarse particle flotation stages and the commissioning of the WHIMS.
- Talison received Ministerial Development Approval No. 1111 to undertake Stage 3 and Stage 4 expansion of the existing Greenbushes Lithium Mine in August 2019.
- Talison has engaged consulting firm GHD to support Talison in gaining the necessary environmental approvals required for the expansion of the Greenbushes Mine.

# 6.3 Greenbushes TSF1 Project

The Greenbushes TSF1 Project is at the development stage. BDA has considered areas where there is perceived technical risk to the project, particularly where the risk component could materially impact the projected cashflows. The assessment is necessarily subjective and qualitative. Risk has been classified from low through to high. In the following section, BDA has considered factors which may ameliorate some of these risks.

Risk Component	Comments			
Mineral Resources/Ore Reserves Low to Low/Medium Risk	The limits of the TSF are clearly defined, and the stratification and grade distribution within it are well understood even at the drill spacing of 200 x 175m. The sonic drilling method is ideally suited to this type of deposit, supplying high quality samples, while the quality of the analytical results has been confirmed by QA/QC.			
	The Mineral Resource model prepared by Talison utilized the inverse distance squared algorithm for grade estimation into large (80 x 80 x 1.5m) blocks; this method is an industry standard method applicable to such deposit, and BDA considers that the model provides results suitable for mining studies based on bulk extraction.			
	Talison classified Mineral Resources as Indicated Resource within both the EZ and DZ units, although mining is contemplated only for the EZ. However, while agreeing that the Indicated classification is suitable for Mineral Resources within the EZ under a bulk mining scenario at the proposed 0.7% Li <sub>2</sub> O cut-off, BDA considers that location of above cut-off Mineral Resources in the significantly lower grade DZ is inadequately defined by current wide-spaced drilling and therefore the DZ Mineral Resources should be considered as Inferred, i.e. not suited to evaluation of the selective mining that would be required.			
	The Probable Ore Reserve has been estimated based on Indicated Mineral Resources in the EZ only, with mining restricted to a maximum depth of 7m. Provision has been made for basal dilution by lower grade DZ material where appropriate, while allowance has been made for minor losses due to removal of the top 0.3m			

containing vegetation.

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Risk Component	Comments
	Given the simplicity of the TSF1 deposit and the fact that bulk mining is proposed only for the EZ zone, resource and reserve risks for this unit are both considered to be low to low/medium.
Mining Low Risk	Mining operation is a simple operation with all material ripped by dozers and loaded to trucks by excavator. Some dewatering of tails will be needed to ensure the water level does not encroach the 7m depth of operation and hamper equipment movement.
Processing Low/ Medium Risk	Processing will utilize the same techniques as those employed in the existing plants, except that no size reduction would be necessary. The techniques employed are well understood on the site.
Production Low Risk	The proposed mining rate of 2Mtpa should be achievable with the planned equipment. Multiple mining areas can be used if required to meet production targets. Processing throughput should be relatively low risk given the processes are known to Talison management.
Capital and Operating Costs Low/Medium Risk	Plant construction is nearing completion and estimated cost is in line with budget. The operation is relatively straight forward but there is some potential for escalation of operating costs.

# **Risk Mitigation Factors**

A number of factors tend to reduce some of the risks identified above. Principal amongst these are:

- The tailings mineralisation is clearly defined and of a simple style. The uppermost unit (EZ) contains economic grades throughout its extent, vertically and laterally, and is thus suited to bulk mining in its entirety. Consequently, it is considered likely that the estimated average grade of the deposit based on regular drilling will match closely to the mined grade, reducing resource and reserve risk to relatively low levels.
- The mining of the tailings is relatively straightforward and the work is a small addition to the planned mining operations in the Central Lode pits. In the initial stages there is flexibility in mining locations reducing production risks.
- Processing uses technology which has been developed on the site and which is well understood.

### 6.4 Cuola Project

The Cuola Project is at the planning and development stage. Only Mineral Resource estimates were reviewed in this CPR as a feasibility study and/or an initial engineering design study conforming with the JORC Code has not been completed for the Cuola Project at the date of this report. Therefore, Ore Reserves, mining operations, processing operations, production, capital costs and operating costs, etc., were not reviewed by BDA in this CPR. BDA has considered areas where there is perceived technical risk to the project. The assessment is necessarily subjective and qualitative. Risk has been

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classified from low through to high. In the following section, BDA has considered factors which may ameliorate some of these risks.

Risk Component	Comments				
Mineral Resources Low/Medium Risk	Geology for the Cuola Project is well understood through systematic exploration programs carried out by the No.108 Brigade from 2009 to 2011.				
	The spodumene pegmatite veins and vein groups have been delineated by systematic diamond core drilling and surface trenching. The larger, regularly-shaped No.632 vein was explored by exploration lines 80m apart; and other smaller, less regular pegmatite veins or vein groups were explored by exploration lines 40m apart. Drill hole/trench spacing on the exploration lines range from 20m to 60m.				
	However, most of the drill holes were drilled at an inclined angle of 80° because of the limitation of the drill rigs used by the No.108 Brigade, which is less than ideal for the steep dipping spodumene pegmatite veins in the Cuola Project. The No.108 Brigade has surveyed all the drill hole collar and down-hole deviation (showing limited dip variation for all the drill holes) and the pegmatite veins are generally several meters to several tens of meters wide; these factors will reduce the impact of the smaller interception angle between drill holes and the pegmatite veins. However, because of this limitation and some wider spaced drilling in some areas, BDA considers that the confidence level of the Measured Mineral Resource estimated by the No.108 Brigade should be lowered to the Indicated Mineral Resource category.				
	Sampling, sample preparation and analysis, and QA/QC at the Cuola Project have all followed acceptable industry practices.				
	Mineral Resource estimation is conducted by the traditional parallel section method and the polygonal method and was completed diligently by the No.108 Brigade. BDA's review indicates that the Mineral Resource estimate, after reclassifying the Measured Mineral Resource to the Indicated Mineral Resource category conforms to the requirements under the JORC Code.				
	BDA considers that the Mineral Resource estimate model produced by the parallel section method and/or polygonal method will be difficult to be used for follow-up mine planning and Ore Reserve estimation. This Mineral Resource estimation model will need to be converted to a three-dimensional block model before being used for follow-up mine planning and Ore Reserve estimation, especially for an open-pit operation.				
Infrastructure, Roads, Transport Low Risk	The current access to the project site is via a dirt-and-gravel road from the east from the town of Tagong; this road is planned to be upgraded by the local government. The G318 highway from				

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Risk Component	Comments
Infrastructure, Roads, Transport (Continued) Low Risk	Chengdu is being upgraded to an expressway system and there is also a new railroad under construction parallel to the highway. The transport conditions will be improved significantly when these upgrades are completed.
	Currently, there is a 10kV power line connecting the project site with a substation at the Jiajika Mine, which provides sufficient electricity for the construction of the Phase I operation at Cuola. The local government is planning to construct a 110kV power line from Tagong to supply electricity for all mining operations in the Jiajika District.
	Water in the glacial erosion lakes at the Jiajika District will provide sufficient good quality water for production and domestic usage.
Tenement and Title Low Risk	BDA has not undertaken a legal due diligence on the property control documents or the mining license for the Cuola Project, but BDA is advised by Tianqi Shenghe that there are no material tenement issues relating to property control documents and the mining license.
Environmental and Social Issues Medium Risk	An environmental impact assessment report for the Phase I 600ktpa open-pit mining operation of the Cuola Project has been approved by the relevant governmental agency. Tianqi Shenghe has been taken appropriate actions to date in relation to environmental protection and ecological conservation and in maintaining good relationships with local residents.
	However, the project site is at the south-eastern edge of the Qinghai-Tibet plateau at an elevation above 4,000m. The natural conditions at the project site are fragile and some of the local residents are sensitive about any potential environmental damage that might be caused by mining operations within the Jiajika District. An alleged environmental incident related to the neighboring Jiajika Mine resulted in the suspension of the Cuola Project as well as the mining operation of the Jiajika Mine in 2013. Although regulatory approval to recommence the construction for the Cuola Project was granted in 2019, Tianqi Sheng is still in discussion internally when and how it should resume the project construction.

# **Risk Mitigation Factors**

A number of factors tend to reduce some of the risks identified above. Principal amongst these are:

• The geology is relatively straightforward, and the mineralisation controls are generally well understood. The mineralised body and grade continuity appears generally good or reasonable.

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- There are significant Inferred Mineral Resources, generally defined over the lower portions of the spodumene pegmatite veins; these resources could be upgraded into Measured and Indicated Mineral Resources with additional drilling and sampling, and thus, subject to economic factors, and appropriate planning and approvals, available for conversion into Ore Reserves.
- Tianqi Shenghe's management and staff are all aware of the importance of environmental protection and ecological conservation.
- Tianqi Shenghe has maintained a close and co-operative relationship with the local community from the beginning of the project. This includes the provision of financial and other support to community groups.

# 7.0 VALUATION

# 7.1 Valuation Methodology, Standards and Procedures

This report has been prepared in keeping with the VALMIN Code for the Technical Assessment and Valuation of Mineral Assets and Securities for Independent Expert Reports as adopted by the Australasian Institute of Mining and Metallurgy in 1995 and as amended and updated in 2005 and 2015. Mineral Resource and Ore Reserve estimation procedures and categorisations have been reviewed in terms of the JORC Code, 2012.

# 7.1.1 Effective Date

The effective date for the valuation is January 1, 2022.

# 7.1.2 Valuation Principles

As a general principle, the fair market value of a property as stated in the VALMIN Code is the amount a willing buyer would pay a willing seller in an arm's length transaction, wherein each party acted knowledgeably, prudently and without compulsion.

# 7.1.3 Valuation Methods

There is no single method of valuation which is appropriate for all situations. Rather, there are a variety of valuation methods, all of which have some merit and are more or less applicable depending on the circumstances. The following are appropriate items to be considered:

- discounted cash flow
- amount an alternative acquirer might be willing to offer
- the amount which could be distributed in an orderly realization of assets
- the most recent quoted price of listed securities
- the current market price of the asset, securities or company.

The *discounted cash flow* or net present value method is generally regarded as the most appropriate primary valuation tool for operating mines or mining projects close to development. This

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generates what is referred to as a technical valuation, which under the VALMIN Code is defined as follows:

**"Technical Value** is an assessment of a Mineral Asset's future net economic benefit at the Valuation Date under a set of assumptions deemed most appropriate by a Practitioner, excluding any premium or discount to account for market considerations."

The term "technical value" is distinct from "market value", which under the VALMIN Code is defined as follows:

"Market Value is the estimated amount (or the cash equivalent of some other consideration) for which the Mineral Asset should exchange on the date of Valuation between a willing buyer and a willing seller in an arm's length transaction after appropriate marketing, where the parties had each acted knowledgeably, prudently and without compulsion."

The Code further notes that "the term Market Value has the same intended meaning and context as the International Valuation Standards Committee ("IVSC") term of the same name. This has the same meaning as Fair Value in Regulatory Guide No. 111 issued March 2011 by Australian Securities and Investment Commission. Market Value may be higher or lower than Technical Value. A Public Report should take such factors into account, stating the results of the principal Valuation Method(s) used and disclosing the amount of and reasons for the difference between the Market Value and Technical Value."

Valuing properties at an earlier stage of exploration where ore reserves, mining and processing methods, and capital and operating costs, are yet to be fully defined, involves the application of alternative methods. The methods generally applied to exploration properties are the *Comparable Transactions* method, the value indicated by *Alternative Offers* or by *Joint Venture Terms*, or by *Past Expenditure*. *Comparable Transactions* are commonly also used for valuing mining or development projects. *Yardstick Values* based on certain industry ratios such as metal in Mineral Resources or Ore Reserves can be used for both mining and exploration properties. Under appropriate circumstances, values indicated by *Stock Market Valuation* should be taken into account as should any *Previous Independent Valuations* of the property.

The valuation methods considered are briefly described below.

# 7.2 Net Present Value ("NPV")

If a project is in operation, under development, or at a final feasibility study stage and Mineral Resources and/or Ore Reserves, mining and processing recoveries, and capital and operating costs are well defined, it is generally accepted that the net present value of the project cash flows is a primary component of any valuation study. This does not imply that the fair market value of the project necessarily is the NPV, but rather that the value should bear some defined relationship to the NPV.

If a project is at the feasibility study stage, additional weight has to be given to the risks related to uncertainties in costs and operational performance, risks related to the ability to achieve the necessary finance for the project, risks related to granting of licenses or permits, environmental and community aspects, political or sovereign risk and sometimes a lower degree of confidence in the reserves and recoveries. In an ongoing operation, many of these items are relatively well defined.

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The NPV provides a technical value as defined by the VALMIN Code. The market value could be determined to be at a discount or a premium to the NPV due to other market or risk factors.

The Greenbushes lithium project has been in operation for many years and has a record of reliable production; it is the largest hard rock lithium producer worldwide, with an established customer base and a strong reputation in the market; Mineral Resources and Ore Reserves have been estimated and reconciliations indicate a strong correlation between estimates and results in practice; mine plans and production schedules have been developed; the processing technology is conventional, proven and demonstrated to be effective; environmental conditions have been maintained at high standards and all necessary approvals for current operations are in place; estimates of forecast capital and operating costs are consistent with historical performances and are considered appropriate; Talison has prepared feasibility studies for proposed expansions.

In these circumstances, BDA considers that, for the Greenbushes operation, a reasonable determination can be made of likely cash flows and therefore the discounted cashflow or NPV method is both applicable and appropriate.

# 7.3 Alternative Valuation Methods

### Previous Transactions, Alternative Offers and Joint Venture Terms

If discussions have been held with other parties and offers have been made on the projects or tenements under review, then these values are certainly relevant and worthy of consideration. Similarly, joint venture terms where one party pays to acquire an interest in a project, or spends exploration funds in order to earn an interest, may also provide an indication of value.

BDA considers that the following transactions are directly relevant as they relate to purchases of interests specifically in the Talison assets and operations:

- Albemarle Corporation 2014—purchase of a 49% interest in the Talison assets and operation
- IGO Limited 2021—purchase of a 49% joint venture interest in Tianqi's 51% holding in Talison and a 49% share in Tianqi's Kwinana LiOH plants.

# Comparable Transactions

Recent comparable transactions on other lithium properties or involving other lithiumproducing companies can be relevant to the valuation of the Tianqi projects and tenements. While it is acknowledged that it can be difficult to determine to what extent the properties and transactions are indeed comparable, this method can provide a useful benchmark for valuation purposes. The timing of such transactions must be considered as there can be substantial change in value with time.

There have been a number of lithium-related project transactions in recent years, but in terms of comparable transactions BDA has focussed on transactions relating to other hard rock lithium projects, and specifically those in WA. The following transactions have been considered:

• Orocobre Limited and Galaxy Limited 2021—merger of the two lithium companies and their assets; the bulk of the value in the transaction related to the brine projects in Argentina, but BDA has considered the component of the transaction relating to the hard rock projects Mt Cattlin in WA and James Bay in Quebec

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- Pilbara Minerals Ltd (PLS) 2021—acquisition of Altura Lithium Operations Pty Ltd Pilgangoora assets and operation in the Pilbara region of WA
- Albemarle Corp 2019—acquisition of a 60% interest in the Wodgina lithium mine in WA
- Wesfarmers Limited 2019—acquisition of a 50% interest in the Mt Holland lithium project in WA from Kidman Resources Ltd
- Yongshan International Co 2019—purchase of 11.8% of Pilgangoora lithium project of Altura Mining Ltd
- Process Minerals International and GFL International 2019—purchase of 13.8% interest in Mt Marion lithium project in WA from Reed Industrial Minerals Pty Ltd.

The transactions considered above are all hard rock lithium projects, largely in WA and thus can be considered comparable (in varying degrees) to Talison's Greenbushes project. However, all the projects are of different sizes, grades and contained lithium. To place them on a more comparable basis a Yardstick process is applied as discussed below.

# Yardstick Valuations

Certain industry ratios are commonly applied to mining projects to derive an approximate indication of value. The most commonly used ratios relate to gold projects and comprise dollars per ounce of gold in Mineral Resources, dollars per ounce of gold in Ore Reserves, or dollars per ounce of annual production, but similar yardsticks can be derived for lithium projects.

BDA has reviewed the values implied by the comparable transactions listed above, and has converted them to Yardstick values in terms of dollars per ton of contained lithium in Mineral Resource. Contained lithium is commonly expressed in terms of contained  $Li_2O$  or contained lithium carbonate equivalent ("LCE") calculated as contained  $Li_2O \ge 2.47$ .

Yardsticks can also be determined in terms of \$/t of contained LCE in Ore Reserves or \$/t of annual LCE production, but \$/t of LCE in Mineral Resources is generally the most widely applied yardstick and this is the yardstick that BDA has applied to allow a meaningful comparison with Talison.

# Market Valuation

On the fundamental definition of value being the amount that a knowledgeable and willing buyer would pay a knowledgeable and willing seller in an arm's length transaction, it is clear that, for listed companies, due consideration has to be given to market capitalization. In the case of a oneproject company or a company with one major asset, the market capitalization gives some guide to the value that the market places on that asset at that point in time, although certain sectors may trade at premiums or discounts to net assets, reflecting a view of future risk or earnings potential. Commonly however, a company has several projects at various stages of development, together with a range of assets and liabilities, and in such cases it is not possible to accurately define the value of individual projects or separate components of the assets in terms of the share price and market capitalization.

Talison is not a listed company and therefore there is not a readily available market valuation of the Greenbushes asset. Tianqi, IGO and Albemarle hold numerous assets, and therefore their market capitalization does not give a direct guide to the market value of the Greenbushes operation.

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#### Past Expenditure

Past expenditure, or the amount spent on exploration of a tenement is commonly used as a guide in determining the value of exploration tenements, and 'deemed expenditure' is frequently the basis of joint venture agreements. The assumption is that well directed exploration has added value to the property. This is not always the case and exploration can also downgrade a property and therefore a 'prospectivity enhancement multiplier' (PEM), which commonly ranges from 0.5-3.0, is applied to the effective expenditure. The selection of the appropriate multiplier is a matter of experience and judgement.

BDA does not consider exploration expenditure is a relevant method of determining value for the Greenbushes project, but considers it is potentially relevant in terms of the Cuola exploration and development project.

### Prospectivity

Over-riding any mechanical or technical valuation method for exploration ground must be recognition of prospectivity and potential, which is the fundamental value in relation to exploration properties. BDA has considered the future prospectivity and development potential of the Greenbushes project.

#### Other Expert Valuations

Where other independent experts or analysts have made recent valuations of the same or comparable properties these opinions clearly need to be reviewed and to be taken into consideration. We have inquired of Tianqi whether any other recent valuations of the Company or its assets have been undertaken.

# 7.4 Special Circumstances

Special circumstances of relevance to mining projects or properties can have a significant impact on value and modify valuations which might otherwise apply. Examples could be:

- *environmental risks*—which can result in a project being subject to extensive opposition, delays and possibly refusal of development approvals
- *indigenous peoples/land rights issues*—projects in areas subject to claims from indigenous peoples can experience prolonged delays, extended negotiations or veto
- *country issues*—the location of a project can significantly impact on the cost of development and operating costs and has a major impact on perceived risk and sovereign risk
- *technical*—issues peculiar to an area or orebody such as geotechnical or hydrological conditions, or metallurgical difficulties could affect a project's economics.

We have considered, and have inquired of Tianqi, whether any such factors apply to the project under review. We consider that there are special circumstances of the nature described above under *"environmental risks"* that would have a material effect on the valuation of the Cuola project.

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#### 7.5 Greenbushes Lithium Project Economic Analysis

Talison has developed a detailed LOM cash flow forecast model for the Greenbushes lithium operations, including both the Central Lode and Kapanga Ore Reserves and the TSF1 Ore Reserves, using only Proven and Probable Ore Reserves based on the following macroeconomic assumptions.

# **Exchange Rates**

The product prices in US\$ have been converted into A\$ using an exchange rate of US\$/A\$0.75 for the life of the mine generally in line with Talison's exchange rate forecast.

# **Lithium Pricing**

BDA is not a marketing expert and has used the lithium price forecast provided by Wood Mackenzie (Asia Pacific) Pty Ltd (Wood Mackenzie), a reputable international marketing research group, for the economic analysis. BDA considers this an appropriate approach and notes it is common to use the price forecast produced by a reputable research institution in valuing mining assets and projects. Wood Mackenzie forecasts are also used by Tianqi in the company forecasts.

In relation to the chemical grade spodumene concentrate pricing, Wood Mackenzie projects contracts to rise from US543/t 6.0% Li<sub>2</sub>O in 2021 increasing to US2,237/t 6.0% Li<sub>2</sub>O in 2023 with a dip to US934/t 6.0% Li<sub>2</sub>O in 2025 before rising steadily to US1,479/t 6.0% Li<sub>2</sub>O by 2032.

#### **Tax and Royalty**

In WA, a royalty of 5% is paid to the State Government for lithium mineral production. Royalties are included in Talison's estimated Operating Expenditure in Table 4.11.

The Australian tax system is controlled by the Australian Taxation Office. Corporate income tax is applied at a rate of 30%. The economic analysis of the Greenbushes Lithium Operations has been prepared on a pre-tax and after-tax basis based on the taxation calculations from the Talison modeling.

# **Discount Rates**

In determining an appropriate real discount rate for the cash flows, BDA has taken into consideration the long production history of the Greenbushes lithium project, the status of existing operations, the planned expansions and the market projections, both in price and volume. From a technical perspective, Greenbushes is a low risk operation. There are current and planned commitments for significant capital expenditure, with some of these still subject to final Board approval.

BDA considers that it is not unreasonable to assume that these expenditures would be funded through a combination of equity and debt, with the latter of the order of 30% of estimated cost. On that basis, BDA has assessed that the weighted average cost of capital ("WACC") would be of the order of 8% real or 10% nominal. This recognizes that there are alternative funding scenarios and that there is risk inherent in both price and volume forecasts. BDA has adopted the consensus forecast price of investment banks and brokers.

#### Forecast Cashflows and Valuation (NPV)—Greenbushes Lithium Operations

BDA conducted a base case economic analysis of the Greenbushes lithium project using the technical and economic parameters discussed in this CPR. The forecast lithium concentrate price for

spodumene concentrate 6% Li<sub>2</sub>O, SC6.0, adopted in this analysis is the Wood Mackenzie forecast; taking this forecast and adjusting the nominal forecast with the forecast inflation, the average price (real) is US\$1,186/t over the LOM or A\$1,546/t. The pricing has been assumed to apply to all the concentrate products from Greenbushes and does not include any allowance for the premiums that are received for the higher quality products. A discount rate of 8% was used to calculate the net present value (NPV); the NPV is based on real values. Greenbushes Mine is an established operation so that a discount rate of 8% (real) is considered appropriate; sensitivity to reasonably broad variations in the discount rate of -20% to +20% is provided in the Sensitivity Analysis.

Based on this analysis, the Greenbushes Lithium Project has a pre-tax NPV of A\$21,013M and an after-tax NPV of A\$14,726M (Table 7.1) as of January 1, 2022. The start of the year discount method was used in calculation of the NPV. BDA notes that Talison's standing debts and cash position have not been factored into this NPV calculation. The project valuation is calculated on 100% basis for the Greenbushes Mine; Tianqi has a 26% interest in the mine through its 26% ownership of Talison.

# Table 7.1

#### Base Case Economic Analysis for the Greenbushes Lithium Project at January 1, 2022

Item	Unit	2022	2023	2024	2025	2026	2027	2028	2029	30-42	Total
Lithium Conc Production	kt	1,395	1,484	1,480	1,879	1,963	2,187	2,179	2,007	23,170	37,744
Average Concentrate Price*	A\$/t	2,924	1,976	1,174	1,289	1,356	1,440	1,479	1,645	1,504	1,546
Total Income	A\$M	3,493	4,349	2,934	2,215	2,541	2,969	3,150	2,978	35,370	60,000
Total Cash Costs	A\$M	580	732	730	816	853	872	849	860	9,565	15,858
Depreciation	A\$M	109	121	115	172	156	208	187	169	1,545	2,783
Taxable Income	A\$M	2,803	3,496	2,088	1,227	1,532	1,890	2,114	1,949	24,260	41,359
Income Tax	A\$M	841	1,049	627	368	460	567	634	585	7,278	12,408
After-Tax Income	A\$M	1,962	2,447	1,462	859	1,072	1,323	1,479	1,365	16,982	28,952
Total Capital Costs	A\$M	364	216	280	292	343	20	18	18	247	1,799
After-Tax Cash Flow	A\$M	1,708	2,353	1,297	739	885	1,511	1,648	1,515	18,280	29,936
Pre-Tax Cash Flow	A\$M	2,549	3,402	1,924	1,107	1,345	2,078	2,282	2,100	25,558	42,343
Discount Factor	@8%	0.93	0.86	0.79	0.74	0.68	0.63	0.58	0.54		
Pre-Tax NPV	A\$M	2,360	2,916	1,527	814	915	1,309	1,332	1,134	8,705	21,013
After-Tax NPV	A\$M	1,581	2,017	1,030	543	602	952	962	819	6,220	14,726

Note: Total Income includes a small income for tantalum concentrate production from the Talison Processing Plants;\*tonnage weighted average

#### Sensitivity Analysis

A sensitivity analysis was conducted for the January 1, 2022 after-tax NPV for variations in the operating costs, lithium concentrate price, processing yield rate, total capital costs and discount rate. The NPV is most sensitive to variations in the lithium concentrate price, and processing yield and slightly less sensitive to variations in discount rate and operating and capital costs (Table 7.2 and Figure 32).

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### Table 7.2

#### Sensitivity Analysis for After Tax NPV as of January 1, 2022 (A\$M)

Sensitivity Item Variation	After Tax NPV Variation (A\$M)					
	-20%	-10%	Base Case	+10%	+20%	
Lithium Concentrate Price	10,741	12,735	14,728	16,722	18,716	
Processing Yield	10,741	12,735	14,728	16,722	18,716	
Total Cash Costs	15,453	15,091	14,728	14,366	14,004	
Total Capital Costs	14,990	14,859	14,728	14,598	14,467	
Discount Rate	16,639	15,637	14,728	13,903	13,151	

Considering a 20% sensitivity range, the after tax NPV result for the implied value of Greenbushes has a range from A\$10.7B to A\$18.7B with a base case of A\$14.7B. Converting the values to US dollar at the assumed exchange rate of US\$/A\$ of 0.75, the range is from US\$8.1B to US\$14.0B with a base case of US\$11.0B.

### Figure 32

# After-Tax NPV Sensitivity Analysis for the Greenbushes Lithium Project (A\$M)



# 7.6 Other Methodologies—Relevant Transactions Valuations

#### **Previous Talison Transactions**

While the NPV method of valuation is considered the most appropriate for an established operating mine such as Talison's Greenbushes operation, BDA also considers that the Albemarle 2014 acquisition of a 49% interest in Talison and IGO's 2021 acquisition of 49% of Tianqi's 51% interest are directly relevant to an assessment of market value.

# Albemarle Acquisition of 49% of Talison 2014

BDA considers that the Albemarle Corporation (NYSE: ALB) purchase of a 49% interest in Talison in 2014 is a relevant transaction to be considered. In that transaction, completed in May 2014,

Rockwood Lithium GmbH, a wholly-owned German subsidiary of Albemarle, purchased 49% of Talison Lithium for a consideration of US\$475M, which notionally valued 100% of Talison at US\$969M.

In 2014, realized lithium prices were around US\$400-430/t SC6 concentrate, with relatively flat forward projections in terms of price and volume. In the 2014 calendar year, the Greenbushes mine produced approximately 420,000t of Li<sub>2</sub>O SC6 concentrate.

To compare the 2014 transaction with current conditions, the Greenbushes mine in 2021 is scheduled to produce approximately 900,000t of SC6 concentrate, or approximately 2.1x the output in 2013/14. The 2021 average price was estimated by Wood Mackenzie to be US\$543/t SC6 concentrate or approximately 1.3x the price in 2014, while current spot prices are in excess of US\$2,000/t SC6 concentrate or approximately 4.8x the price in 2014; so a valuation price factor of 3.0x is considered reasonable. On this basis, given that production capacity and product price are directly linked to value, BDA estimates that the 2014 transaction value of US\$969M should be incremented by the above factors, giving a 2021 value of US\$6.1B.

BDA notes that the lithium concentrate production at Greenbushes is projected to increase to an average of more than 1.2Mtpa based on CGP 1 and 2, with potential for a further doubling to 2.5Mtpa with the planned construction of CGP3 and 4. Output from the Tailings Retreatment Plant (TRP) is included in current projections.

Wood Mackenzie's current outlook for concentrate sales prices is generally positive, with prices for SC6 concentrate remaining above US\$1,500/t in the medium term and averaging US\$1,400/t over the next 10 years.

BDA considers that a willing and knowledgeable buyer would factor in some of this upside potential, however, it should be acknowledged that there are also uncertainties relating to both future market supply and demand and the potential impact of numerous new producers. BDA considers that the implied value of US\$6.1B based on the Albemarle transaction provides a reasonable base case, but further increments could well be argued given future production and price projections.

### IGO Transaction 2021

In January 2021, IGO subscribed a 49% joint venture interest in Tianqi's 51% holding in Talison and in Tianqi's Kwinana LiOH plants assets for US\$1.4B, giving IGO a 24.99% interest in Talison, with Tianqi holding 26.01%. This is considered a directly relevant transaction which provides a relatively recent assessment of value.

BDA notes that the transaction included acquisition of a 49% interest in Tianqi's LiOH plant in Kwinana, and that this needs to be taken into account in assessing the value ascribed to the Talison Greenbushes assets. The capital expenditure on Train I and II at the time of the acquisition was quoted at US\$700M, with US\$220M still to be spent on commissioning of Train I and completion of Train II. It would thus be reasonable to assume that US\$343M of IGO's US\$1.4B investment represented its 49% share of expenditure to date on the LiOH plants, with the remaining US\$1.06B representing its acquisition of a 24.99% interest in Talison and its assets, implying a 100% value of Talison of US\$4.2B.

While the IGO transaction is relatively recent, the lithium market has moved significantly since the start of 2021, with the lithium carbonate and lithium hydroxide prices increasing 50-100%. While the increase in the SC6 concentrate price has been less dramatic, increases of 40-50% have been realized. The IGO transaction was agreed in December 2020, close to the lowest point in the recent price curve; it would not be unreasonable to assess that the same transaction, done today, would likely be completed at a 25-50% premium. BDA notes that IGO's share price has roughly doubled in the

period since the Tianqi transaction, from approximately A\$5 per share to around A\$10/share; it would not be unreasonable to attribute a significant portion of this increase to its lithium investment.

### **Comparable Projects—Yardsticks**

The 'Previous Transactions' section above deals with guides to valuation based on actual transactions on the specific Talison tenements and project to be valued. A guide to value can also be derived from consideration of comparable transactions on other lithium hard rock projects. BDA has examined a number of recent transactions on other lithium producers and developing producers, as set out in Table 7.3, to estimate a range of yardstick values based on contained lithium in Mineral Resources, specifically US\$ per ton of contained lithium carbonate equivalent. While the Greenbushes project remains the world's largest hard rock lithium producer (around 22% of annual world production) and is also one of the highest grade lowest cost producers, there are several projects of a scale potentially similar to Greenbushes in Australia, including Pilgangoora (Pilbara Minerals), Mount Marion (Mineral Resources/Ganfeng) and Mount Holland (Wesfarmers/SQM), Wodgina (Mineral Resources/Albemarle), and several other smaller-scale projects such as Mt Cattlin (Allkem, formerly Galaxy) that may provide reasonable scope for comparison. BDA has considered recent transactions on these projects which have enabled estimation of \$/t of contained LCE yardsticks. The transactions considered are as follows:

- Orocobre Limited/Galaxy Limited June 2021—merger of the two lithium companies and their assets; the bulk of the value in the transaction related to the brine projects in Argentina, but BDA has considered the component of the transaction relating to the hard rock projects Mt Cattlin in southern WA and James Bay in Quebec which Deloitte valued at US\$80-85M and US\$260-300M respectively
- Pilbara Minerals Ltd (PLS) January 2021—acquisition of Altura Lithium Operations Pty Ltd Pilgangoora assets and operation in the Pilbara region of WA from liquidators for US\$175M
- Albemarle Corp November 2019—acquisition of a 60% interest in the Mineral Resources Ltd Wodgina lithium mine in the Pilbara region of WA for US\$1.3B implying an enterprise value (100%) of US\$2.2B
- Wesfarmers Limited May 2019—acquisition of a 50% interest in the Mt Holland lithium project in WA east of Perth from Kidman Resources Ltd for US\$543M implying an enterprise value (100%) of US\$1.1B
- Ganfeng and Mineral Resources Ltd March 2019—purchase of 13.8% interest in Mt Marion lithium project SW of Kalgoorlie in WA from Neo-Metals Limited Ltd for A\$103.8M (US\$78M), implying an enterprise value of US\$565M

BDA has examined five producing or advanced hard-rock lithium projects in Western Australia: Pilgangoora, Mount Marion, Wodgina, Mount Holland, and Mt Cattlin and one hard rock lithium project in Canada, James Bay, all of which have been subject to acquisition transactions over the last three years, allowing an estimation of project enterprise value based on the transaction and Yardstick values based on the lithium Mineral Resources. Table 7.3 below summarizes the transactions, the project Mineral Resources, the enterprise values on a 100% basis and the calculated Yardstick based on US\$/t of contained LCE (lithium carbonate equivalent).

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### Table 7.3

### **Australian Lithium Projects**

Project	Owner	Transaction	Mineral Resources Mt	Grade % Li2O	Cont. LCE Mt	EV (100%) US\$M	Yardstick US\$/t LCE
Mt Cattlin	Galaxy	Orocobre (post merger)	11	1.29	0.3	83	277
James Bay	Galaxy	Orocobre (post merger)	40	1.40	1.4	280	200
Pilgangoora	Altura Mining	Pilbara 100%	46	1.07	1.2	175	146
Wodgina	Mineral Resources	Albemarle 60%	260	1.17	7.7	2,200	286
Mt Holland	Kidman Resources	Wesfarmers 50%	189	1.50	7.0	1,100	157
Mt Marion	NeoMetals	Ganfeng/Min Res 13.8%	78	1.34	2.6	565	217

Note: EV for Mt Cattlin and James Bay based on Deloitte 2021 allocation

In terms of existing production and current expansion projects, Talison's Greenbushes project is the most advanced, with a long history of operations. However, all the projects selected have similarities to Greenbushes, all are hard-rock, open cut operations, all (except James Bay) are in Western Australia, and all are producing (or planning to produce) a similar suite of spodumene concentrate products. All the WA projects would have similar transport costs and market geography.

However, the James Bay and Mt Holland projects are still at a feasibility study/development stage, the Pilgangoora project of Altura Mining was closed and purchased by Pilbara Mining from the liquidators, and the Wodgina project at the time of acquisition was on care and maintenance. Mt Cattlin is in operation but has limited remaining Mineral Resources. On balance BDA considers that the Talison Greenbushes project, with substantial Mineral Resources and a proved production history would command a 50-100% premium compared with the average project yardsticks calculated in Table 7.3.

For the projects considered, the values based on Enterprise Value implied by recent transactions per contained ton of LCE in resource, range from US\$146/t to US\$286/t, with a resource-weighted average of US\$218/t. Using the yardstick figures gives an implied value to Talison's Greenbushes contained 13.1Mt LCE Mineral Resources in the range of US\$2.0B to US\$3.8B or US\$2.9B based on the weighted average.

BDA considers that the valuation figure for Greenbushes would be weighted towards the higher end of this range (US\$3.8) and, as discussed, a minimum 50% premium would likely apply, giving a most likely valuation of US\$5.7B.

### 7.7 Summary of Comparison of Valuations

BDA has derived a range of valuations based on the various methods outlined above. These are presented in Table 7.4.

# **COMPETENT PERSON'S REPORT**

### Table 7.4

# **Comparison of Valuations Greenbushes Mine**

Valuation Method	Low Valuation US\$B	Most Likely US\$B	High Valuation US\$B
NPV at 8%	8.1	11.0	14.1
Albemarle Acquisition 49%	5.4	6.1	7.8
IGO Acquisition 24.99%	3.8	4.2	4.6
Comparable Transaction Yardsticks – EV/t LCE	5.1	5.7	6.3
Average Valuation Assessed	5.6	6.8	8.2

Note: ranges based on  $\pm 10\%$  around Most Likely value

Overall, the valuation of the existing and proposed Greenbushes hard-rock mining and processing operations lies within the range of US\$5.6B to US\$8.2B, with a most likely value of US\$6.8B. Overall, BDA considers the range and most likely valuation to be a fair and reasonable valuation of the Greenbushes mining and processing operations; while the NPV figure is considered a Technical Value, the Average Valuation Assessed takes account of alternative methods and is considered a market value, based on the definitions of the VALMIN Code.

#### Conclusions

BDA has assessed the various inputs to the Greenbushes valuation and has found that the economic analysis based on the parameters applied to the Mineral Resources shows that with the estimated capital and operating costs the Ore Reserves are viable and meet the requirement for reserves; this is based on the forecast lithium prices for spodumene concentrates provided by Wood Mackenzie for related parties transactions. The economic analysis takes into account the planned expansion of the operations at Greenbushes from a processing rate of around 2Mtpa to 9Mtpa over a seven-year period. It is based on BDA's review of the production schedules, capital and operating costs, and commodity pricing provided by Wood Mackenzie. The economic analysis is based on the Ore Reserves within the Central Lode and Kapanga and indicates that the project is relatively robust over a range of concentrate prices and operating costs.

# 8.0 SOURCES OF INFORMATION

BDA has undertaken site visits to the Greenbushes Mine on several occasions since 2012, most recently in March 2018 and November 2021, and has undertaken a site visit to the Cuola Project in April 2018. BDA has held discussions with Talison technical and management staff on site as well as via teleconferencing, as well as holding brief discussions with SRK and RSC. Meetings have been conducted with Tianqi and representatives of the consulting groups for the Cuola Project.

The principal technical reports and documents reviewed are listed below:

# **Greenbushes Mine Technical Data**

- Greenbushes Lithium Operations: NI43-101 Technical Report, December 21, 2012 Talison Lithium Limited, December 2012
- Greenbushes Water Dams Inspection Report 2014—GHD Pty Ltd, October 2014
- Mining Proposal 2015 Tailings Storage Expansion—Talison Lithium Australia Pty Ltd, December 21, 2015
#### **COMPETENT PERSON'S REPORT**

- Annual Environmental Monitoring Report 2015-2016—Talison and GAM, June 2016
- Summary Report of Rehabilitation Liability Calculation—Talison, June 2016
- Annual Environmental Report and Annual Audit Compliance Report 2015-2016—Talison and GAM, September 2016
- Talison Lithium Onsite Testing Report July August 2016 Greenbushes Operations, Western Australia – Veolia Water Solutions & Technologies (Australia) Pty Ltd, November 2016
- Talison Lithium Pty Ltd, Chemical Grade Plant 2 (CGP2) Project Pre-Feasibility Report MSP Resource Development Consultants, January 2017
- Mine Closure Plan 2016—Talison, February 2017
- Mining Rehabilitation Fund Assessment Notice MF101857 for 2016/2017, Government of Western Australia Department of Mines and Petroleum, July 2017
- Greenbushes CGP3 (Chemical Grade Plant No 3) Concept Study, Lycopodium Limited, January 2018
- Chemical Grade Plant Number 2 Feasibility Study Talison Lithium Pty Ltd, February 2017
- Talison Greenbushes Project Tenements List at April 17, 2018—Talison, April 2018
- Greenbushes Central Lode Pegmatite: Li<sub>2</sub>O Estimate—Talison Lithium Pty Ltd, March 2018
- Mineral Resources and Ore Reserves Update for the Central Lode, March 31, 2018—Talison Lithium Pty Ltd, June 2018
- Greenbushes Tailings Facility 1 Reprocessing—Mineral Resource and Ore Reserve for March 2018—Talison Lithium Pty Ltd, June 2018
- Report on TSF1 Tails Drilling Program—Talison Lithium Pty Ltd, March 2018
- Mine and Mill Production Statistics for April, May and June 2018—Talison Lithium Pty Ltd, September 2018
- Greenbushes Annual Geotechnical Review, PSM Consult Pty Ltd, July 2019
- Western Australian Government Ministerial Approval No. 1111 for the development of Stage 3 and Stage 4 expansion activities at the existing Greenbushes Lithium Mine—WA Minister for Environment, August 2019
- Greenbushes Annual Geotechnical Review, PSM Consult Pty Ltd, August 2020
- Talison Lithium Monthly Reports—Talison Lithium Pty Ltd, December 2018, December 2019, December 2020, January to December 2021
- Greenbushes Mine Hydrogeological Review 2020, PSM Consult Pty Ltd, October 2021
- Greenbushes Lithium Deposits Mineral Resources 2021 Update (Draft 0), SRK Consulting (Australasia) Pty Ltd, December 2021
- Review of Mineral Resources and Ore Reserves of the Greenbushes Lithium Deposit, RSC Consulting, December 2021

- Greenbushes Mineral Resources and Ore Reserves Report- Board Paper, Windfield Holdings Pty Ltd, December 2021
- Greenbushes Mineral Resources and Ore Reserve Statement (Effective Date: August 31, 2021), Talison Lithium Pty Ltd, March 2022
- Lithium Industry Report, Wood Mackenzie (Southeast Asia) Pty Ltd, May 2022

#### **Cuola Project Technical Data**

- Exploration Geology Report of Cuola Spodumene Mining District in Yajiang County, Sichuan Province—No.108 Geological Exploration Brigade of Geology and Mineral Resource Exploration and Development Bureau of Sichuan Province, September 22, 2011
- Feasibility Study Report for the Phase I Mining and Processing Operation of the Yajiang Spodumene Mine of Sichuan Tianqi Shenghe Lithium Company Limited—Lanzhou Engineering & Research Institute of Nonferrous Metallurgy, February 2012
- Initial Engineering Design Study Report for the Phase I Mining and Processing Operation of the Yajiang Spodumene Mine of Sichuan Tianqi Shenghe Lithium Company Limited Lanzhou Engineering & Research Institute of Nonferrous Metallurgy, July 2012
- Environmental Impact Assessment Report for the Phase I Mining and Processing Operation of Yajiang Spodumene Mine of Sichuan Tianqi Shenghe Lithium Company Limited—Sichuan Academy of Environmental Protection Science, December 2012
- Approval of the Environmental Impact Study Report for the Phase I Mining and Processing Operation of Yajiang Spodumene Mine of Sichuan Tianqi Shenghe Lithium Company Limited—Environmental Protection Department of Sichuan Province, February 26, 2013
- Land Reclamation Plan Report for the Phase I Mining and Processing Operation of Yajiang Spodumene Mine—Sichuan Changqing Land Management Company Limited in Chengdu, December 2013
- Directive for Immediately Suspend Production for Mining Operations in Tagong District —Land and Mineral Resources Department of Ganzi Tibetan Autonomous Prefecture, October 16, 2013
- Information Regarding the Mining and Processing Project of the Cuola Spodumene Mine in Yajiang County—Tianqi Shenghe Lithium Company Limited, April 2018

#### **General Data**

- Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves—Report of the Joint Committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia December 2012
- Australasian Code for the Technical Assessment and Valuation of Mineral and Petroleum Assets and Securities for Independent Expert Reports—The VALMIN Code—Report of the Joint Committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia—2015

# **COMPETENT PERSON'S REPORT**

• Hong Kong Stock Exchange—Rules Governing the Listing of Securities on the Stock Exchange of Hong Kong Limited, Chapter 18, Mineral Companies—Disclosure Requirements and Continuing Obligations for Mineral Companies—June 2010

### GREENBUSHES MINERAL RESOURCE AND ORE RESERVE STATEMENT JORC CODE-CHECK LIST OF ASSESSMENT AND REPORTING CRITERIA, TABLE 1

### JORC CODE 2012 Edition Table 1 for Greenbushes Mine, Western Australia, Australia

#### SECTION 1: SAMPLING TECHNIQUES AND DATA

Criteria	Commentary			
Sampling Techniques	• Talison Lithium Pty Ltd (Talison) has drill-sampled the Greenbushes Central Lode, Kapanga and Tailings Storage Facility 1 (TSF1) Mineral Resource estimate (MRE) volumes, with the Central Lode and Kapanga drilled by reverse circulation percussion (RC) drilling and diamond core drilling (DD). The TSF1 MRE volume was drilled using sonic drilling (SD).			
	• The holes drilled from surface at the Central Lode and Kapanga have collar spacings ranging from 25m to 50m across and along strike. The DD holes drilled from underground workings at the northern end of the Central Lode have a close spaced pattern, fanning out from the workings. The underground infill drilling took place from the hangingwall and footwall mine infrastructure. The TSF1 SD holes are drilled on a nominal 200m grid spacing.			
	• Apart from a few holes drilled to collect geotechnical information, the Central holes drilled from surface generally plunge towards local mine grid east to intersect the mineralisation at a high angle. Sample representativity has been ensured by monitoring core recovery to minimize sample loss. SD holes drilled to test the TSF1 resource are vertical.			
	• For the August 31, 2021 Central Lode MRE, the database contains approximately 616 diamond core holes equating to approximately 111km of drilling, and approximately 560 RC holes equating to approximately 77km of drilling. These holes were drilled in numerous programs conducted between 1977 and 2021.			
	• For the August 31, 2021 Kapanga MRE, the drill hole database contains 24 diamond core holes equating to approximately 4.8km of drilling, and 216 RC holes equating to approximately 42km of drilling. Over 90% of the holes were drilled between 2018 and 2021.			
	• For the March 31 2018 TSF1 MRE, the drill hole database			

• For the March 31, 2018 TSF1 MRE, the drill hole database include 34 SD drillholes for a total length of 759m.

# **COMPETENT PERSON'S REPORT**

### JORC CODE 2012 EDITION TABLE 1 FOR GREENBUSHES MINE, WESTERN AUSTRALIA, AUSTRALIA

#### SECTION 1: SAMPLING TECHNIQUES AND DATA

Criteria	Commentary			
Drilling Techniques	• RC drilling using face-sampling bits was used with hole diameters of either 5 1/2 inch (140mm) or 5 1/4 inch (133mm).			
	• DD has been used for deeper holes and for drilling from underground platforms, with a few diamond tail extensions drilled from RC pre-collars.			
	• Triple tube DD has been used in areas of broken ground to improve core recovery for geotechnical logging.			
	• The core from some DD holes drilled to collect data for geotechnical studies has been oriented.			
	• The DDs drilled for Central Lode and Kapanga MRE work include several different core diameters including 36.4mm (BQ), 47.6mm (NQ) and 63.5mm (HQ2, HQ3).			
	• The TSF1 MRE drilling comprised SD to collect 3-inch (76.2mm) cores.			
Drill Sample Recovery	RC recovery:			
	• Selected RC holes have had the cuttings from 1m downhole intervals weighed over the entire hole length to provide data for assessment of the expected mass against the actual recovered mass. A few of the older RC holes have had samples collected over 2m down hole intervals.			
	• RC recovery is logged qualitatively as 'good' to 'poor' with recovery generally logged as 'good' except for samples collected within the first few meters from surface.			
	• The lithia grades from nearby RC and DD holes have been compared to assess the potential for grade bias due to RC fines losses. No material biases between the two drill methods have been identified for the Central Lode data. Review of several pairs of twinned holes contained in the Kapanga dataset showed apparent biases for Li <sub>2</sub> O, raising the possibility of preferential loss of light minerals during RC drilling.			
	DD recovery:			
	• Recovery has been measured as the percentage of the total length of core recovered compared to the drill interval.			
	• Core recovery is consistently high (95 to 100%) in fresh rock			

• Core recovery is consistently high (95 to 100%) in fresh rock with minor losses occurring in heavily fractured ground or for DD drilling in the regolith.

#### JORC CODE 2012 EDITION TABLE 1 FOR GREENBUSHES MINE, WESTERN AUSTRALIA, AUSTRALIA

# Criteria Commentary Triple tube DD has been used to maximize recovery in zones of broken ground and the weathered zone. Recovery monitoring and triple tube drilling are the main methods used to maximize core recovery. The TSF1 SD recovery was photographed and recorded as good with one logging entry and one sample taken per 1.5m core barrel return to allow for expansion and contraction typical in sonic drilling returns. No significant relationships have been identified between grade and sample recovery. Logging RC cuttings and DD and SD cores have been logged geologically and geotechnically with reference to standardized logging codes, to levels of detail that support MRE work, Ore Reserve estimation (ORE) and metallurgical studies. The information collected is considered appropriate to support any downstream studies by the Competent Person. Qualitative logging includes codes for lithology, regolith, and mineralisation for RC, DD and SD samples, with sample quality data recorded for RC such as moisture, recovery, and in 10% of RC sample mass. DD sub-sampling size is recorded. DD cores are photographed, qualitatively structurally logged with reference to orientation measurements where available. Geotechnical quantitative logging includes QSI, RQD, matrix and fracture characterization. The total lengths of all drill holes have been logged. Sub-sampling Techniques and RC sampling: Sample Preparation RC samples were collected from a splitter (riffle, static cone and rotary cone) that collected a 3-5kg split of the primary lot from each downhole sampling interval. Most samples were collected from dry ground conditions. The main protocol to ensure the RC samples were representative of the material being collected was visual logging of sample recovery, weighing sample return on 5-10% of holes and, collection and assay of 5% field duplicates

#### SECTION 1: SAMPLING TECHNIQUES AND DATA

of primary samples.

#### JORC CODE 2012 EDITION TABLE 1 FOR GREENBUSHES MINE, WESTERN AUSTRALIA, AUSTRALIA

#### SECTION 1: SAMPLING TECHNIQUES AND DATA

Commentary

#### DD sampling:

- DD cores samples have been collected over intervals determined by geological boundaries but generally targeting a 1m length within the same zone of contiguous geology.
- Cores were generally half-core sampled with the core cut longitudinally using a core saw having a wet diamond impregnated cutting blade.
- Some of the larger diameter HQ core collected for metallurgical test was quarter core sampled.

SD sampling:

• The TSF1 SD sample intervals are 1.5m down hole with the SD core captured in half PVC pipe and cut with a blade or wire to prepare a 'half core' tailings sample

Laboratory preparation:

- All samples were delivered in pre-numbered sample bags to Talison's on-site laboratory, with the sample chain-of-custody from the drill site to the laboratory managed by the Talison's site technical staff.
- The laboratory then took over the chain-of-custody and used an internal digital tracking system for sample management.
- The samples were then oven dried for 12 hrs at ~110°C before being crushed to a particle size distribution (PSD) of 100% passing 5mm.
- A rotary splitter, was then used to collect a ~1kg sub-sample from the crushed lot.
- For the majority of samples the crushed lots were pulverized using tungsten grinding bowls. During the tantalum mining era up ~2012 most samples were pulverized using standard steel grinding bowls except those expected to represent low iron technical grade plant feed which also used tungsten grinding bowls.
- Following pulverizing, a pulp sub-sample was collected into a small packet to serve as the assaying source lot.

Quality controls:

• All laboratory sample preparation was carried out by trained technicians who followed the specified laboratory procedures for each sample preparation workflow.

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Criteria

# JORC CODE 2012 EDITION TABLE 1 FOR GREENBUSHES MINE, WESTERN AUSTRALIA, AUSTRALIA

#### SECTION 1: SAMPLING TECHNIQUES AND DATA

Criteria	Commentary
	• Independently of the site laboratory, the site geological staff insert certified reference materials at a 1:20 frequency in every batch.
	• Sample pulps are retained for future reference and coarse rejects are discarded.
	• Talison's reviews of quality sample results confirm that the levels of precision, accuracy and levels of potential sample cross contamination are acceptable for MRE work. The precision half absolute relative difference values for field duplicates having grades ≥0.2% Li <sub>2</sub> O is less than ±10% relative for 85% of replicates collected since 2016.
	Sample size versus grain size:
	• Lithia bearing spodumene typically comprises between 15 to 55% of the mineralisation, and as such is in relatively high concentration.
	• The sample sizes collected at the primary and sub-sampling stages are considered appropriate by the Competent Person.
Quality of Assay Data an Laboratory Tests	d • No geophysical tools have been used to determine any analyte concentrations for MRE work.
	• A small aliquot of the sample preparation pulp was collected and digested in sodium peroxide and the resulting solution concentration of lithia.
	• A suite of 36 accessory analytes were also determined using fusion digestion and X-ray fluorescence, however these additional analytes are not included in the Publicly Reported MRE, albeit iron grade has been used to assist in the interpretation of zones of TG mineralisation.
	• Talison's technical staff maintains standard work procedures for all data management steps, with an assay importing protocol established that ensures quality control samples are checked and accepted before data can be loaded.
	• The site laboratory internal quality systems include replicate (pulp repeat) laboratory analyzes, analysis of known standards by XRF, and round-robin interaction with other laboratories.
	• Li <sub>2</sub> O in geological drill samples is not analyzed in replicates; instead, the AAS machine is recalibrated before every batch of samples

#### SECTION 1: SAMPLING TECHNIQUES AND DATA

Criteria	Commentary
	• Known solution standards and blanks are embedded in each batch and the accuracy of the calibration is monitored regularly during analysis. The precision of the AAS analysis technique for lithium is statistically monitored by the laboratory
Verification of Sampling and Assaying	• The pegmatite mineralisation characteristics, the drill coverage, and the resource estimation procedures mean that the resource estimates are not significantly influenced by individual intersections. Talison periodically commissions independent consultants to review the resource models and the supporting data. Data entry is electronic and held in an acQuire SQL database. Internal data entry and validation procedures operate in acQuire, backed up by physical and screen checks
	• Twin holes have been drilled to compare assay results from RC and DD drilling.
	• A 36 element assay suite is compared to lithology which has high contrast between pegmatite and host rocks. From these comparisons Talison's geologist consider that there is no material down hole smearing of grades in the RC drilling and sampling.
	• There have been no adjustments or scaling of lithium assay data.
Location of Data Points	• Throughout years of data collection up to date industry standard equipment available at the time has been used. Most of the recent drill hole collar locations were surveyed by company surveyors using real time kinematic differential global positioning system equipment (RTK-DGPS), to a reported accuracy of less than 10cm. Underground DD collars were surveyed using total station equipment during the time of underground mining
	• Most holes (drilled since 2000) were downhole surveyed using either an Eastman single shot camera or (more recently) gyroscopic equipment. The survey intervals ranged from approximately 5 to 100m, and for most holes, measurements were recorded every 10 to 30m. A few early RC holes have not been surveyed and the short vertical SD holes in TSF1 do not have hole path surveys

#### SECTION 1: SAMPLING TECHNIQUES AND DATA

Criteria	Commentary
	• The mine grid eastings are approximately aligned to the strike of the main pegmatites with the trend of mine grid north approximately 11° west of Magnetic North and 15.7° west of True North.
	<ul> <li>The transformation between local and MGA grid is a two point transform using the following paired coordinates:</li> <li>Location Local X Local Y MGA X MGA Y</li> </ul>
	A10,166.94110,524.225414,290.9666,251,535.324B9,833.49912,778.814413,362.0026,253,615.642
	• Talison adds constant of 1,000m to the mine grid elevations relative to AHD elevations.
	• The digital terrain model is a synthesis of photogrammetric surveys and regular pit surveys and of good quality for MRE work. Active mine workings are surveyed monthly by company surveyors
	• The precision of the TSF1 survey is considered have a precision of ±1m in three dimensions
Data Spacing and Distribution	• For Central Lode, the drill section spacing is typically 50m, with spacings of approximately 25m along section. However, the drill coverage and spacing is quite irregular given the extensive mining and exploration history, and the variable geometry of the pegmatite.
	• For Kapanga, the majority of the holes were drilled on a regular grid with a nominal spacing of 40m along east-west section lines and 50m between section lines
	• The drill hole spacing for the TSF1 estimate is ~200m square collar spacing.
	• Down hole sample intervals for the Central Lode and Kapanga are nominally 1m, with diamond core samples were terminated at geological contacts while a 1.5m down hole sample interval was used for the TSF1 drilling.
	• Central Lode sample results were composited to 3m lengths prior to estimation
	• The majority of Kapanga samples were collected using RC drilling over 1m intervals, and this was retained as the

• TSF1 samples were collected over 1.5m intervals, and this was retained as the composite length

composite length

# **COMPETENT PERSON'S REPORT**

# JORC CODE 2012 EDITION TABLE 1 FOR GREENBUSHES MINE, WESTERN AUSTRALIA, AUSTRALIA

#### SECTION 1: SAMPLING TECHNIQUES AND DATA

Criteria	Commentary
	• The Competent Person considers that these data spacings are sufficient to establish the degree of geological and grade continuity appropriate for the MRE and ORE estimation procedures, and the JORC Code classifications.
Orientation of Data in Relation to Geological Structure	• Nearly all drill holes are oriented to intersect the mineralisation at a high angle and as such, the Competent Person considers that a grade bias effect related to the orientation of data is highly unlikely.
Sample Security	• The drill sites and laboratory are located on the Greenbushes minesite, with both having controlled access
	• The sample chain-of-custody is managed by Talison's technical personnel. Samples were collected in pre-numbered bags, for transport from the primary collection site to the laboratory. This generally happens on the day the samples are collected, or on the following day
	• Sample dispatch sheets are verified against samples received at the laboratory and other issues such as missing samples and so on are resolved before sample preparation commences. The laboratory has ISO 9001 accreditation and has a detailed sample tracking system.
	• The Competent Person considers that the likelihood of deliberate or accidental loss, mix-up or contamination of samples is very low.
Audits or Reviews	• RSC conducted a review of the 2021 MRE and found no fatal flaws and recommended additional twinned holes in the Kapanga deposit.
	• Field quality control data and assurance procedures are reviewed by Talison's technical staff on a daily, monthly and quarterly basis
	• The sampling quality control and assurance of the sampling was reviewed by consultants Quantitative Geoscience in the 2000s, Behre Dolbear Australia in 2018, and as part of IGO's due diligence work by Snowden Mining Industry Consultants in 2019. No adverse material findings were reported in any of these reviews.
	• A 2021 review by SRK Consulting Australasia (SRK) noted that Talison rigorous quality control programs for assay, which have been in place since 2007, cover ~40% of the

#### JORC CODE 2012 EDITION TABLE 1 FOR GREENBUSHES MINE, WESTERN AUSTRALIA, AUSTRALIA

#### SECTION 1: SAMPLING TECHNIQUES AND DATA

Commentary

Central Lode data and effectively all the Kapanga drilling. In a recent Competent Person Report review by Behre Dolbear Australia (BDA), BDA noted that there is an apparent positive bias for lithia when comparing nearby Kapanga RC and DD samples, which may be material given most of the Kapanga drilling is RC. BDA further noted that a similar bias is observed by Talison in pit grade control samples, with a 5% factor applied to adjust grades down for forecasting plant head grades.

Criteria

# **COMPETENT PERSON'S REPORT**

### JORC CODE 2012 EDITION TABLE 1 FOR GREENBUSHES MINE, WESTERN AUSTRALIA, AUSTRALIA

#### SECTION 2: REPORTING OF EXPLORATION RESULTS

Criteria						Commentary		
Mineral Tenure St	Tenement tatus	and	Land	• Greenbushe Pty Ltd (Ta the holding (49%) JV. Albemarle	es is 100% lison). Talis company fo The remai Corp.	owned by Tali son is 51% own or the Tianqi L ning 49% of	ison Lithium A ned by TLEA v ithium (51%) a Talison is ow	which is nd IGO rned by
				• The WA m and OREs a	ineral tenen re tabulated	nents relevant t below.	o Greenbushes	' MREs
				Location	Name	Granted Date	Expiry Date	Area (ha)
				Mining	M01/02	28 Dec 1984	27 Dec 2026	969
				C	M01/03	28 Dec 1984	27 Dec 2026	1000
					M01/04	28 Dec 1984	27 Dec 2026	999
					M01/05	28 Dec 1984	27 Dec 2026	999
					M01/06	28 Dec 1984	27 Dec 2026	985
					M01/07	28 Dec 1984	27 Dec 2026	998
					M01/08	28 Dec 1984	27 Dec 2026	999
					M01/09	28 Dec 1984	27 Dec 2026	987
					M01/10	28 Dec 1984	27 Dec 2026	1000
					M01/11	28 Dec 1984	27 Dec 2026	999
					M01/16	28 Dec 1984	27 Dec 2026	18
					M01/18	28 Dec 1984	27 Dec 2026	70.4
					M07/765	28 Dec 1984	27 Dec 2026	3
				Exploration	E70/5540	8 Mar 2021	27 Dec 2026	222.6
				General Purpose	G01/01	17 Nov 1986	27 Dec 2026	10
					G01/02	17 Nov 1986	27 Dec 2026	10
				Miscellaneous	L01/01	19 Mar 1986	27 Dec 2026	9
				• State Fore Biodiversity the tenure, land.	st (manage v, Conservat with most o	ed by WA ions and Attrac f the remaining	State Departm ctions) covers ~ g (~40%) being	nent of -55% of g private

- M01/06, M01/07 and M01/16 cover the operating mining, and processing areas, an area ~2000ha, and contains the entire MRE. The general purpose leases cover the processing facilities.
- There is a sublease agreement between Talison and Global Advanced Metals (GAM), with the latter owning the rights to all non-lithium metals on the tenements.

#### SECTION 2: REPORTING OF EXPLORATION RESULTS

Criteria				Commentary
Exploration Parties	Done	By	Other	• Mining in the Greenbushes region has been almost uninterrupted since the tin mineral cassiterite was first discovered in 1886, making Greenbushes the longest continuously operating mine in Western Australia.
				• The first tin miner in the area was the Bunbury Tin Mining Co in 1888 followed by Vulcan Mines who carried out oxide tin sluicing operations from 1935 to 1943.
				• Many prospectors held small leases in what is now the operational area sinking hundreds of shallow exploration shafts all over the area and numerous exploration adits seeking alluvial and lode deposits.
				• The Kapanga underground mine operated sporadically in the first half of the 1900s reaching 45m below surface.
				• From 1945 to 1956 tin dredging commenced using more modern equipment and in 1969, Greenbushes Tin NL commenced open pit mining of oxidized soft rock below surface.
				• Hard rock open pit tin-tantalum mining and processing at 0.8Mt/a commenced in 1992 with the ore sourced from the now near completed Cornwall Pit. This mining included underground mine development in 2001 to source high grade tantalum ore when the process capacity was increased to 4Mt/a. In 2002, tantalum demand declined rapidly and the tantalum/tin treatment plant was placed into care and maintenance.
				• Greenbushes Limited commenced open pit mining in 1983 and commissioned a 30kt/a lithium mineral concentrator in 1985. The mining and processing assets were subsequently acquired by Sons of Gwalia Ltd ("SOG") in 1989 and the concentrate production capacity was increased to the 100kt/a in the early 1990s, then increased to 150kt/a by 1997, including the production of chemical grade lithium concentrate.
				• Resource Capital Fund ("RCF") purchased the Greenbushes Mine tenement package from SOG in 2009 creating the lithium and tantalum company Talison Minerals. RCF then split Talison Minerals into two companies Talison Lithium Limited (Talison) with the lithium mining rights on the tenement package and GAM with the rights to non-lithium minerals on the tenure.

• Drilling data available to the 2021 MRE dates back to 1977.

#### SECTION 2: REPORTING OF EXPLORATION RESULTS

Criteria	Commentary
Geology	• The Greenbushes Central Lode Deposit is one of the world's largest and highest lithium grade hard rock deposits. The Central Lode is an elongate steeply northwest dipping, lithium rich pegmatite body, that intruded along the Donnybrook-Bridgetown shear zone ~2.53Ga years ago into the older and largely lithium-barren, high grade metamorphic country rocks of amphibolite (hangingwall) and granofels (footwall) of the Balingup Metamorphic Belt.
	• The tectonic history of the region is complex with up to four phases of correlated deformation and metamorphism. The pegmatite is interpreted to have intruded around the time of the second major tectonic event and was subsequently crosscut by later east-west dolerite intrusives prior to the fourth event.
	• All rocks have been weathered to depths of ~40m below natural surface.
	• Greenbushes' lithium bearing pegmatites present as a series of linear dykes and/or en echelon pods that range from a few meters in strike length up to 3km, and with true thickness ranging from 10 to 300m. The pegmatites have intruded at the boundaries between the major sequences of country rocks.
	• The Kapanga Deposit is a satellite deposit ~300m mine-grid east of the Central Lode with similar geology but with pegmatites generally thinner. The Kapanga pegmatites comprise a package of sub-parallel stacked lodes and pods of variable thickness
	• Several compositional zones are recognized in the pegmatite, with lithium rich zones observed to occur preferentially on the footwall and hangingwall zones of the Central Lode pegmatite. Tin and tantalum occur in the albite zone of the pegmatite and were the motivation for the historic mining at Greenbushes, mainly from the Cornwall Pit. Generally, the mineralisation presents as stacked higher grade lenses within a low grade alteration envelope. The zonation at Kapanga is broadly similar, with concentration of spodumene in the upper parts of the local sequence.
	• The high-grade lithium zone of the pegmatite comprises mostly spodumene and quartz, with local parts of the zone containing up to 50% of the lithium bearing mineral spodumene, which has a lithium concentration of ~8% Li <sub>2</sub> O.

#### **SECTION 2: REPORTING OF EXPLORATION RESULTS**

Criteria	Commentary
	• The lower grade zones of the pegmatites consist of variable proportions of microcline feldspar and albite along with quartz and spodumene with some pegmatite zones containing no spodumene
	• Greenbushes' TSF1 mineral resource is the processing tail from earlier phases of tin and tantalum mining and processing from the Central Lode deposits. As such the tailings have similar mineralogy to the Central Lode pegmatite.
	• The TSF1 'geology' is characterized by a ~7m thick upper layer of higher-grade 'enriched' tailings overlying a ~7.5m lower grade layer 'depleted' layer, which in turn overlies the pre-existing natural surface.
	• All rocks have been extensively lateritised during peneplain formation in the Tertiary, with weathering and lithium leaching effects reaching to depths of up 40m below surface.
Drill Hole Information	• No exploration results are presented in this report.
	• The Competent Person considers the MREs give a balanced view of all the drill hole information.
Data Aggregation Methods	• No drill hole intercepts are reported so this item is irrelevant.
Relationship Between Mineralisation Widths and Intercept Lengths	<ul> <li>Apart from a few geotechnical drill holes and selected underground fan DD holes, the majority of the MRE related drilling intersects the mineralisation at a high angle and as such approximates true thicknesses in most cases.</li> <li>The Competent Person considers that the risk of a grade bias introduced due to a relationship between intersection angle and grade is very low.</li> </ul>
Balanced Reporting	• The Competent Person considers that the MREs are based on all available data and provide a balanced view of the deposits under consideration.
Other Substantive Exploration Data	• For this active mine there is no other substantive exploration data material to the MRE.
Diagrams	• Representative diagrams of the geology and mineral resource extents are included in the main body of this Public Report.
Further Work	• Exploration drilling is continuing within the Greenbushes tenements with several advanced exploration targets on regional pegmatites.

# **COMPETENT PERSON'S REPORT**

### JORC CODE 2012 EDITION TABLE 1 FOR GREENBUSHES MINE, WESTERN AUSTRALIA, AUSTRALIA

Criteria	Commentary
Database Integrity	• Talison capture all geoscientific drill hole information for MRE work using laptop interfaces. The data is then stored in an SQL Server database and managed using acQuire software, which is a well-recognized industry software for geoscientific data storage, manipulation and validation.
	• The acQuire interface has a number of inbuilt validation tools. These include predefined dictionary definitions, valid range check and logical value checks.
	• Historical drill hole data was manually captured on hard copy log sheets, these were manually transcribed and all material geological logging has been captured in the SQL database. As interpretation of the mineralisation is primarily driven by lithia assays, the Competent Person considers any lack of complete historical geology transfer to be not material.
	• In 2006, Greenbushes migrated to an integrated SQL Server database for the storage of exploration and production control data. The earlier data were exported across from a Paradox database or Excel file.
	• Talison selected a random sample of historical assay data transferred into the SQL database and compared the results to the original records to confirm the loading of historical assay records was correct – no material issues were found in this audit process.
	• Talison validates all data following loading through visual inspection of results on-screen both spatially and using database queries and cross section plots. Typical checks carried out against original records to ensure data accuracy include items such as overlapping records, duplicate records, missing intervals, end of hole checks and so on.
	• The Competent Person considers the risk of data corruption through transcription errors between initial collection and use in the MRE process to be very low risk.
Site Visits	• The Competent Person for the MRE is the Geology Superintendent for Greenbushes and as such has detailed knowledge of the data collection, estimation, and reconciliation procedures for this MRE revision.

# **COMPETENT PERSON'S REPORT**

### JORC CODE 2012 EDITION TABLE 1 FOR GREENBUSHES MINE, WESTERN AUSTRALIA, AUSTRALIA

#### SECTION 3: ESTIMATION AND REPORTING OF MINERAL RESOURCES

Criteria	Commentary				
Geological Interpretation	Central Lode and Kapanga:				
	• The Central Lode geological model was prepared by SRK NA and Talison using Leapfrog Geo implicit modeling techniques, and subsequently reviewed and updated by SRK. The Kapanga model was prepared by Talison using Leapfrog Geo implicit modeling techniques and reviewed and updated by SRK.				
	• A second 3D digital wireframe was prepared in a similar process for the more highly mineralised pegmatite using a >0.7% Li <sub>2</sub> O threshold. The high-grade wireframe was nested inside the larger volume pegmatite wireframe.				
	• The models were prepared using extensive datasets that included geological logging data and geochemical data acquired from resource definition drilling. Grade control data and pit mapping data were also used for Central Lode. The models included the main lithological units, structural features, alteration zones, and grade domains				
	• The deposits show significant complexity, which is common for most pegmatite deposits. Alternative interpretations are possible for both the geometry and extents of the pegmatites, and for the alteration zones, which have been defined using probabilistic approaches. However, given the relatively good drill coverage, it is unlikely that alternative interpretations will report significantly different grades and tonnages. It is considered that the uncertainty in the geology model is adequately accounted for in the resource classifications.				
	• A depth of weathering surface was prepared to allow modeling of the oxidized near surface parts of the deposit.				
	TSF1				
	• Multiple current staff at the mining operation were present in the creation of this man-made structure. This along with the survey data that constrains the dam provides for an indicated level of confidence in the geological interpretation of the deposit with respect to spatial constraints and depositional process.				

• Geology logging provides a clear indication of the domain boundaries of the natural surface, unmineralised clay layer

#### SECTION 3: ESTIMATION AND REPORTING OF MINERAL RESOURCES

Criteria	Commentary
	and mineralized sand/silt zone. The internal division of the sand/silt zone is clearly defined by a geochemical break in the 36 element assay suite.
	• The grade and geological continuity of the deposit is a function of the ore types processed through the processing plants that generated the deposited tailings over several years. As tailings are discharged at the walls they flow toward the middle with the heavier spodumene settling out earliest in sub horizontal layers.
Dimensions	Central Lode and Kapanga:
	• The Central Lode consists of a large primary intrusion surrounded by numerous smaller sub-parallel dykes and pods. It has been interpreted over a north-north westerly strike length of approximately 3.5km, and it dips at approximately 40° to the west. The zone is up to 300m wide and has been interpreted to a depth of several hundred meters below surface.
	• The Kapanga deposit is located approximately 300 m to the east of Central Lode. It has been interpreted over a northly strike length of approximately 1.8km. It typically dips at 40–50° to the west, with some steepening to 60° in the southern part of the deposit. The pegmatite has been interpreted as several sub-parallel stacked lodes of varying thickness and length, as well as numerous smaller pods, with an overall thickness of approximately 150m. It has been interpreted to a depth of approximately 450m below the surface.
	• The weathered zone typically extends to a depth of 20–40m, and the majority of the lithium has been leached from this zone.
	• The Publicly Reported MRE is constrained by a 'break-even' pit optimisation shell that has dimensions of 2.8km along strike 150-180m wide horizontally and extending to a maximum depth of 580m below surface.
	TSF1:
	• TSF1's MRE has dimensions of ~1km north south and ~0.7km east west in the mine grid system.
	• The mean death of the combined mineralized tailings

• The mean depth of the combined mineralised tailings (EZ+DZ) ranges between 8 to 15m below current surface.

## **COMPETENT PERSON'S REPORT**

# JORC CODE 2012 EDITION TABLE 1 FOR GREENBUSHES MINE, WESTERN AUSTRALIA, AUSTRALIA

#### SECTION 3: ESTIMATION AND REPORTING OF MINERAL RESOURCES

Criteria			Commentary
Estimation	and	Modeling	Central Lode and Kapanga:
Techniques			• Consultants SRK prepared the Central Lode/Kapanga MRE for Talison.
			• The Mineral Resource Estimates were prepared using conventional block modeling and geostatistical estimation techniques.
		• The same model framework was used for Central Lode and Kapanga. However, they were modeled separately using different datasets and estimation procedures and parameters. The two models were combined into a single model for Mineral Resource reporting.	
		• Leapfrog Edge was used to prepare the Central Lode model. Datamine Studio RM was used to prepare the Kapanga model. The two models were combined and converted to Surpac for handover to Talison's mine planning team.	
	• KNA studies were used to assess a range of parent cell dimensions, and a size of 20×20×20m (XYZ) was considered appropriate given the drill spacing, grade continuity characteristics, and expected end-user requirements for the combined model. Sub-celling down to 5×5×5m was applied to enable the wireframe volumes to be accurately modeled.		
		• The domain wireframes were applied as soft boundary estimation constraints in the Central Lode model and as hard boundary estimation constraints in the Kapanga model.	
		• Probability plots were used to assess for outlier values. Grade cuts were not applied, but distance restrictions were applied to Li <sub>2</sub> O and Fe <sub>2</sub> O <sub>3</sub> grades above selected thresholds in some domains.	
			• The parent cell grades were estimated using Ordinary Kriging. Search orientations and weighting factors were derived from variographic studies. Dynamic anisotropic searching was used in Central Lode to adjust the local search orientations to match any localized changes more closely to the strike and dip of the pegmatite units in the geological model. It was not applied for Kapanga where the pegmatite orientations were observed to be more consistent (at the

current drill spacing).

#### SECTION 3: ESTIMATION AND REPORTING OF MINERAL RESOURCES

Criteria Commentary A multiple-pass estimation strategy was invoked, with KNA used to assist with the selection of search distances and sample number constraints. Extrapolation was limited to approximately half the nominal local drill spacing. Local estimates were generated for the following analytes, both as in situ grades (head grades), and concentrate grades: Kapanga—Li<sub>2</sub>O, Fe<sub>2</sub>O<sub>3</sub>, Sn, Ta<sub>2</sub>O<sub>5</sub>, Al<sub>2</sub>O<sub>3</sub>, SiO<sub>2</sub>, CaO, MgO Central Lode-Li<sub>2</sub>O, Fe<sub>2</sub>O<sub>3</sub>, SnO<sub>2</sub>, Ta<sub>2</sub>O<sub>5</sub>, MnO, Na<sub>2</sub>O, P<sub>2</sub>O<sub>5</sub>, CaO Where possible, the same or similar estimation parameters were used to estimate all variables in each parent cell to ensure that any grade relationships present in the sample data are reproduced in the model. Default grades based on the dataset averages were assigned to cells that did not receive a kriged grade. These cells were flagged accordingly in the model. Model validation included: Visual comparisons between the input sample and estimated model grades Global and local statistical comparisons between the sample and model data An assessment of estimation performance measures including slope of regression, and percentage of cells estimated in each search pass A check estimate using nearest neighbor interpolation. TSF1 Talison prepared a digital block model template in Surpac software in mine grid coordinates. The parent block dimensions were set to 80m squares in the horizontal and 1.5m vertically, which approximates half the information spacing horizontally and agrees with the SD sampling length. Sub blocks were permitted down to 10m squares in the horizontal and 0.75m in the vertical to ensure

volumes defining each estimation layer.

acceptable precision by block volume of the wireframe

### JORC CODE 2012 EDITION TABLE 1 FOR GREENBUSHES MINE, WESTERN AUSTRALIA, AUSTRALIA

Criteria	Commentary
	• The wireframe surfaces were used to prepare blocks for the EZ and DZ as well as the dam walls and the basal clay zone. Only lithia grade and density were estimated.
	• Block grades were estimated from the 1.5m long composites using an inverse distance squared algorithm with a 200m wide horizontal, and 50m vertical search that estimated grades for 98% of the model volume in each layer. Blocks not estimated in the search were assigned the mean grade of composites from each zone.
	• A minimum of three and a maximum of 16 composites were required for a block to be estimated.
Moisture	• Tonnages for both the Central Lode, Kapanga and TSF1 were estimated on a dry basis.
Cut-off Parameters	Central Lode and Kapanga:
	• Talison reported the estimate using a 0.5% Li <sub>2</sub> O block model cut-off within a break-even pit optimisation shell. The cut-off grade is consistent with the operations' process tailing grades at the time the estimate was prepared.
	TSF1:
	• Talison reported the estimate using a 0.7% Li <sub>2</sub> O block model cut-off as the processing plants were typically tailing at 0.6% Li <sub>2</sub> O at the time of estimation and processing of lower grades of tails are believed to be unrealistic. This will be revised in future based on the performance of the operating retreatment plant.
Mining Factors or Assumptions	Central Lode and Kapanga:
	• Talison has assumed that mining will continue by conventional open pit drill and blast, and load and haul as currently used in the active Central Lode pits.
	• RC grade control will be used to define ore prior to mining, and close spaced patterns will be used to delineate pods of TG ore.
	• The resource model will contain some internal dilution, but external dilution has not been intentionally added to the resource model. It is expected that Kapanga will be mined

Criteria			Commentary
		using techniques that that similar to those currently used at Central Lode.	
			• In order to assist with an assessment of the reasonable prospects of eventual economic extraction, Talison used the combined model to conduct a preliminary pit optimisation study. This was based on current and projected operational data and on pricing provided by their corporate division.
			• A series of pit shells were generated, and the Mineral Resource has been limited to the pegmatite contained within the pit shell based on a revenue factor = 1.
			TSF1:
			• The tailings will be mined by conventional load and haul surface methods without blasting and processed through the TRP
Metallurgical	Factors	or	Central Lode and Kapanga:
Assumptions			• Ore will be processed through the existing spodumene concentration plants to produce TG and CG saleable products.
			• Proposed new plants will have similar or superior design parameters to the existing plants.
			• Process plant recovery factors and mineralogy for the existing plants are based on historical processing metrics, with these recoveries considered achievable in new proposed chemical grade plants.
			• Preliminary metallurgical test work on Kapanga indicates similar mineralogy and that saleable spodumene concentrates are achievable.
			• The process flowsheets keep deleterious elements at acceptable levels for customer products and multi-finger stockpile blending is also used to assist in meeting product specifications.
			• The technical grade concentrate produced ranges from 5.0 to 7.2% $Li_2O$ and <0.15% Fe, and chemical grade concentrate grades 6.0% $Li_2O$
			TSF1:
			• The tailings will be processed through the TRP with expected lithia recovery of 70%.

## **COMPETENT PERSON'S REPORT**

### JORC CODE 2012 EDITION TABLE 1 FOR GREENBUSHES MINE, WESTERN AUSTRALIA, AUSTRALIA

Criteria			Commentary
Environmental Assumptions	Factors	or	• The reported Mineral Resources are contained within approved tenement boundaries. Greenbushes is an operating mine that is currently extracting and processing ore from Central Lode. It is expected that future mining, processing, and waste disposal procedures will be similar to the current procedures and be subject to the same or similar permitting requirements.
			• the Competent Person reasonably expects that Greenbushes Operation will obtain all future approvals to mine, process, and extract spodumene concentrates in the MRE, and that there are no known insurmountable impediments to gaining additional approvals for additional process plants, expanded infrastructure and water supply. See the relevant Ore Reserve sections further below for more details
Bulk Density			Central Lode and Kapanga:
		• In situ density of the pegmatite was determined using conventional water displacement methods on over 2,000 drill cores.	
			• Fresh core is relatively impermeable, and porosity is not a significant issue when performing the water immersion tests.
			• The data was used to derive a regression equation for pegmatite to estimate MRE block density based on lithia grade – where Density $(t/m^3) = 2.59 + 0.071 \times \%Li_2O$ .
			• The density test results for waste host rock lithologies are averaged, and these values are assigned as defaults to model cells of equivalent lithology A value of 1.8t/m <sup>3</sup> was applied to the oxidized near surface materials, based on mining reconciliation information.
			TSF1:
			• A density of 1.67t/m <sup>3</sup> was assigned to all tailings (both EZ and DZ) being the average density of five SD core measurements throughout the deposit.
Classification			Central Lode and Kapanga:
			• The MRE has been classified into the JORC Code categories of Measured, Indicated and Inferred Mineral Resource based

### JORC CODE 2012 EDITION TABLE 1 FOR GREENBUSHES MINE, WESTERN AUSTRALIA, AUSTRALIA

#### SECTION 3: ESTIMATION AND REPORTING OF MINERAL RESOURCES

Criteria	Commentary
	on Talison's and the Competent Persons assessment of data quality, data spacing and estimation quality.
	• The classifications applied to the Mineral Resource Estimates are based on a consideration of the confidence in the geological interpretation, the quality and quantity of the input data, the confidence in the estimation technique, and the likely economic viability of the material.
	• The largest source of uncertainty is the reliability of the local estimates and the accuracy of the lithological interpretation, both of which are influenced by drill hole spacing. Based on these considerations, the classifications are largely based on the local drill spacing and estimation performance data.
	• For Central Lode, an interim classification of Indicated was assigned to each pegmatite model cell using criteria that included the number of informing drill holes, the average sample distance, and the estimated slope of regression. An interim classification of Inferred was assigned to the remining pegmatite cells. The interim coding was used to create solids that delineated broader areas of consistent classification, and these solid were used to assign the final classification.
	• For Kapanga, the drill holes and the pegmatite model cells were examined on east-west cross-sections. An Indicated boundary was defined by delineating strings around areas where the drill spacing was regular, the majority of the model cells had been estimated using the first search pass, and the slope of regression exceeded 0.6. Extrapolation distances beyond the drilling were limited to approximately 20–30m. An Inferred boundary was interpreted to capture any remaining pegmatite between 20–50m beyond the Indicated boundary.
	• As described above, the Mineral Resource is limited to the fresh pegmatite contained within a conceptual pit shell generated using a revenue factor = 1.

• JORC Code Measured Mineral Resources were assigned to broken ore stockpiles, where final grade control has given high confidence in the lithia grades. Indicated and Inferred

### JORC CODE 2012 EDITION TABLE 1 FOR GREENBUSHES MINE, WESTERN AUSTRALIA, AUSTRALIA

#### SECTION 3: ESTIMATION AND REPORTING OF MINERAL RESOURCES

Criteria	Commentary
	Mineral Resources were assigned to broken ore stockpiles with lesser quality grade and volume records.
	TSF1:
	• The MRE has been classified as JORC Code Indicated Mineral Resource based on Talison's and the Competent Persons assessment of data quality, data spacing and estimation quality.
	• The outcome of the MRE process reflects the Competent Person's view of the estimates
Audits or Reviews	• Prior MRE estimates and the Talison's estimation processes have been reviewed in 2018 at a high level by Behre Dolbear Australia Pty Ltd (BDA), who concluded that the estimates were consistent with the requirements of the prevailing JORC Code and that reasonable prospects of eventual economic extraction had been demonstrated.
	• In 2020, Snowden Mining Industry Consultants reviewed the prior estimates and process for IGO and concluded there were no fatal flaws in the MRE processes applied for the Central Lode and TSF1 and the estimates were generally low risk.
	• The 2021 MRE revision has been reviewed internally by Talison's senior geological staff.
	• A December 2021, fatal flaw independent review prepared by resource and mining consultants RSC found no fatal flaws in Talison's method of preparation or reporting of the August 2021 MRE and Ore Reserve Estimation (ORE).
Relative Accuracy/Confidence	• No specific statistical studies have been completed to quantify the estimation precision of either the Central Lode, Kapanga or TSF1 estimates.
	• The Mineral Resource Estimates have been prepared and classified in accordance with the guidelines of the JORC Code, and no attempts have been made to further quantify the uncertainty in the estimates.

• The validation checks indicate good consistency between the model grades and the input datasets. The largest source of

### JORC CODE 2012 EDITION TABLE 1 FOR GREENBUSHES MINE, WESTERN AUSTRALIA, AUSTRALIA

Criteria	Commentary
	uncertainty is considered to be the local accuracy of the geological interpretation and grade estimates.
•	The descriptions of the sample collection, preparation and testing procedures, as well as the compiled and assessed QA/QC data, are only available for recent programs, resulting in some uncertainty in the reliability of the earlier datasets. The risks associated with this are partly mitigated against by several factors, including:
•	Most of the earlier data were acquired from diamond core drilling, where recovery issues are easier to identify
•	The samples have all been prepared and tested by the same laboratory, with only minor changes to procedures
•	Routine reconciliation data does not indicate significant data quality issue
•	Most of the resources in the area covered by the early drilling have been mined
•	The uncertainty associated with data reliability is reflected in the resource classifications
•	The Mineral Resource quantities should be considered as global and regional estimates only. The model is considered suitable to support mine design studies, but is not considered suitable for production planning, or for studies that place significant reliance upon the estimates for individual block grades.

### **COMPETENT PERSON'S REPORT**

# JORC CODE 2012 EDITION TABLE 1 FOR GREENBUSHES MINE, WESTERN AUSTRALIA, AUSTRALIA

### SECTION 4: ESTIMATION AND REPORTING OF ORE RESERVES

Criteria	Commentary
Mineral Resource Estimate for Conversion to Ore Reserves	• The MREs for the Central Lode, Kapanga and TSF1 described in the previous sections of this JORC Table 1 were used as the basis for ORE work.
	• The MREs are inclusive of the ORE for both the Central Lode, Kapanga and TSF1 estimates
Site Visits	• The Competent Person for the estimate is Andrew Payne, who is a qualified mining engineer, and an employee of Talison Lithium who holds the position of Mine Planning Superintendent.
Study Status	Central Lode and Kapanga:
	• The Central Lode open pit mine has been in operation since the mid-1980s.
	• The August 2021 ORE study is based on operational budgets, well understood OPEX and CAPEX costs with the level of study equivalent to Feasibility Study or better as defined in the prevailing JORC Code.
	• Process expansions have been costed and scheduled for in- house studies at least a Pre-Feasibility if not Feasibility Study level.
	TSF1
	• The study for the exploitation of the TSF1 ORE is consistent with Feasibility Study as defined in the prevailing JORC Code.
	• The construction of the TRP is complete and commissioning is imminent.
Cut-off Parameters	Central Lode, Kapanga and stockpiles:
	• The cut-off grade is a >=0.7% $Li_2O$ ORE model block threshold after application of key Modifying Factors such as mining, processing and product delivery cost assumptions.
	• An analysis of a breakeven cut-off grade has been completed and is well below $0.7\%$ Li <sub>2</sub> O
	• A cut-off lower than $0.7\%$ Li <sub>2</sub> O is not appropriate for the ORE until test work is completed to test if that material is able to be processed. Material between $0.5\%$ and $0.7\%$ Li <sub>2</sub> O and all pegmatite <0.5% Li <sub>2</sub> O are stockpile for potential processing later.

#### JORC CODE 2012 EDITION TABLE 1 FOR GREENBUSHES MINE, WESTERN AUSTRALIA, AUSTRALIA

#### SECTION 4: ESTIMATION AND REPORTING OF ORE RESERVES

Criteria	Commentary
	• The ORE is reported within the LOM final pit design
	TSF1:
	• The cut-off grade is a >0.7% Li2O ORE model block threshold after application of key Modifying Factors such mining, processing and product delivery cost assumptions.
	• Costs considered include processing and maintenance fixed and variable costs, general administration costs, ore premium including re-handle and overhaul, closure costs and all non-mining related stay-in-business capital expenses.
Mining Factors or Assumptions	Central Lode:
	• The recovery and yield factors translating Resources to Reserves are determined from process plant performance (Technical Grade Plants and Chemical Grade Plant 1) over the last 12 months. Chemical Grade Plant 2 (CGP2) is being commissioned at the time of compiling the Ore Reserve and has not yet reached the modeled recovery or yield. Modeled recoveries and yields for CGP2 have been used to derive the Ore Reserve as those recoveries and yields are expected beyond plant commissioning.
	• The Resource-to-Reserve translation factors for the 2021 Reserves are 100% of tons and 100% of the lithium grade. The Mineral Resource has been reconciled / calibrated to process plant performance, so no factors were necessary.
	• The mining method is contractor mining open pit drill and blast, load and haul, which has been executed at the operation since the mid-1980s.

- The pit development plan is a series of staged cutbacks using practical mining widths and equipment access, and achievable vertical advance rates.
- The pit optimisation that was used to guide the mine design was prepared in Whittle Software using geotechnical parameters recommend by well-respected geotechnical consultant.
- Inferred Resources are not applied to the pit optimisation determining the Reserve shell and Pit Design; however Inferred Resources have been included in the LOM schedule

### JORC CODE 2012 EDITION TABLE 1 FOR GREENBUSHES MINE, WESTERN AUSTRALIA, AUSTRALIA

#### SECTION 4: ESTIMATION AND REPORTING OF ORE RESERVES

Criteria			Commentary
			that underpins the cashflow model. Inclusion of these Inferred Resources is not expected to alter the Ore Reserve
			• The voids from a former underground mine have not been excluded from the ORE, but the tonnage of ~200kt is not material in terms of the reporting estimation precision.
			TSF1:
			• Only the top ~7m of TSF1, which comprises the EZ of mineralisation, is considered for the ORE.
			• An average of 0.2m has been considered as ore loss, mainly due to the vegetation cover.
			• An average of 0.2m has been considered as floor dilution from the underlying DZ.
			• The TSF walls are assumed to remain with a 3:1 slope angle around the margins of the extracted ORE.
			• There are no Inferred Mineral Resources associated with the ORE for TSF1
Metallurgical Assumptions	Factors	or	• Spodumene concentrates have been extracted and sold from Talison's Greenbushes Operation since the mid-1980s using conventional crushing, grinding, gravity, and flotation circuits.
		•	• Processing plant recovery factors from the three (3) existing plants applied to the Reserves calculation are based on historical performance capabilities of the plant, ore grades and ore quality, except for CGP2. This plant was being commissioned at the time of compiling the ORE and has not yet reached the modeled recovery or yield. Modeled recoveries and yields have been used to derive the Ore Reserve as those recoveries and yields are expected beyond plant commissioning.
			• The process flowsheets keep deleterious elements at acceptable levels for customer products and multi-finger stockpile blending is also used to assist in meeting product specifications.
			• Talison defines 'yield' as the mass percent of ore feed to the

process plants that reports to concentrate. The yields are

# JORC CODE 2012 EDITION TABLE 1 FOR GREENBUSHES MINE, WESTERN AUSTRALIA, AUSTRALIA

#### SECTION 4: ESTIMATION AND REPORTING OF ORE RESERVES

Criteria	Commentary
	consistent with the lithia (and hence spodumene mineral) grades fed to each respective plant.
	• The technical grade concentrate produced ranges from 5.0 to 7.2% Li <sub>2</sub> O and <0.15% Fe, and chemical grade concentrate grades 6.0% Li <sub>2</sub> O.
	• The tailings re-treatment plant (TRP), which is soon to be commissioned, will process the TSF1 ORE at ~2Mt/a. The flow sheet involves scrubbing, attrition, desliming, magnetic separation of iron minerals, the flotation of lithium minerals followed by filtration to a concentrate.
	• Greenbushes produces five technical grade products, ranging from 5.0% to 7.2% $\text{Li}_2\text{O}$ with different target maximum ferric oxide grades ranging from a 0.12% up to 0.25% Fe <sub>2</sub> O <sub>3</sub> . Chemical grade concentrate grades 6% $\text{Li}_2\text{O}$ with a 1.0% Fe <sub>2</sub> O <sub>3</sub> Grade.
Environmental	• Greenbushes operates under the Department of Mines, Industry Regulation and Safety (DMIRS) requirements and a Department of Water and Environmental Regulation (DWER) environmental license.
	• Current permits allow a processing rate of ~4.8Mt/a of ore.
	• Approvals to expand the processing capacity to ~9.5Mt/a are in progress with the relevant state and federal authorities and Talison expects that the expansions will be managed under the existing licenses described above.
	• To meet a ~9.5Mt/a process rate will require the identification of new surface water catchment sources.
	• All approvals for the exploitation of the TSF1 ORE are in place.
	• Greenbushes Operation is within a state forest and Talison are in ongoing consultation with the Department of Biodiversity, Conservation and Attractions with respect to mine closure.
Infrastructure	• Greenbushes has mined and processed lithium ore since the mid-1980s and all necessary infrastructure is in place to support the currently approved operations.
	• The two planned additional chemical grade plants (CGP3 and CGP4) will require additional power supply and Talison are

### SECTION 4: ESTIMATION AND REPORTING OF ORE RESERVES

Criteria	Commentary
	working with Western Power to install a 133kV powerline from Bridgetown to the mine to power the new processing operations.
	• A 250 room camp has been established for the GCP2 construction workforce and can be used in future for construction of future plants CGP3 and CGP4.
	• Investigations are underway to provide additional catchment water supply from the eastern side of the mine area.
	• An additional TSF is required to store excess tailings. Strategies for the location of this facility are being formulated. A lack of tailings storage is not expected to impact on planned production targets and therefore Ore Reserves.
	• Strategies are being formulated to provide additional waste dump capacity to support the mining of these Reserves. Land tenure or government approvals are not expected to impact on planned production targets and therefore Ore Reserves
	• Applications are in progress to clear areas for additional waste rock dumping.
	<ul> <li>No other significant infrastructure is anticipated and sustaining capital costs for infrastructure are included in current plans and supporting studies.</li> </ul>
	• With the construction of CGP2, Talison has added a concentrate storage shed and associated materials handling facilities at the Port of Bunbury. Additionally, a water treatment plant has been installed at the mine site.
	<ul> <li>The ramp-up schedule for the pit optimisation study assumed product CY end productions of ~0.88Mt (CY21), ~1.13Mt (CY22 and CY23), ~1.13Mt (CY24), ~1.54Mt (CY25), ~1.7Mt (CY26), and ~2.1Mt (C27 onwards)</li> </ul>
	• In August of 2019 Talison received Ministerial Approval No. 1111 to undertake Stage 3 and Stage 4 expansion of Greenbushes including the development of larger open pit, construction of two additional chemical grade processing plants and the TRP, and additional crusher and centralized ROM, a new mine services area and explosives storage and handling facility, expansion of the Floyd's Waste Dump, and the establishment of new infrastructure corridors for a bypass

road, powerline, pipeline and road corridors.

# JORC CODE 2012 Edition Table 1 for Greenbushes Mine, Western Australia, Australia

#### SECTION 4: ESTIMATION AND REPORTING OF ORE RESERVES

Criteria	Commentary
Costs	• Capital costs for production expansions include the cost associated with the completion of the TRP plant and the construction of CGP3 and CGP4. The remaining costs for the TRP are based on EPCM estimates by the construction contractor and Talison estimates for owner's costs. The costs for the additional two chemical plants are based on in-house Feasibility Studies and Talison's prior experience with the construction of the newly commissioned CGP2 plant.
	• Sustaining capital costs are estimated based on Talison's prior experience of cost relative to the value of installed processing operations.
	• Mining costs are based on current open pit contractor mining costs and have been adjusted for 'rise and fall' terms.
	<ul> <li>Processing costs (including tailings costs), product transportation costs and administration costs are based on operating budgets, that have been adjusted for planned increases in production and are based on Talison's past extensive experience relating to fixed and variable costs.</li> </ul>
	• WA State royalties are levied at 5% of sales revenue after allowing for deductions of overseas shipping costs, where applicable.
Revenue Factors	• Long term chemical grade product prices and exchange rates are based on reputable, independent forecasts. Long term technical grade product prices are based on current prices and are assumed to remain flat in real terms.
	• Price and foreign exchange assumptions for Greenbushes are managed by Talison. Sales agreements are commercial in confidence but are consistent with independent forecasts.
Market Assessment	• The continued strong growth in the rechargeable battery sector is expected to drive increasing demand for lithium.
	• Talison expects to see a decline in market share as forecast lithium market growth outpaces the rate of growth of Talison's sales because of production expansions.
Economic	• An inflation rate of 2.5% per annum was assumed for all prices and costs, except capital costs in 2022 where 6.25% was assumed.
	• The NPV of the mine plan was determined using a nominal discount rate of 10% per annum.
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# JORC CODE 2012 EDITION TABLE 1 FOR GREENBUSHES MINE, WESTERN AUSTRALIA, AUSTRALIA

#### SECTION 4: ESTIMATION AND REPORTING OF ORE RESERVES

Criteria	Commentary
	• The NPV is most sensitive to changes in product price, exchange rates and sales volumes.
Social	• Talison has strong working relationships with the local community and key stakeholders and considers that it has a social license to operate.
	• Proactive community programs include community programs and projects, tourism, environmental actives, and schools and education programs.
	• Talison is also a significant employer in the local community with most of its workforce living within a 20-minute drive from the operation.
Other	• Talison considers that there:
	• Are no material naturally occurring risks associated with the current operation or planned future expansions.
	• No material issues relating to current legal and marketing agreements.
	• Are reasonable grounds to expect that all necessary government approvals will be received within the timeframes anticipated for the Feasibility Study expansion plans.
Classification	• The OREs are classified after due consideration of the MRE classifications with Measured Mineral Resources converting to Proved Ore Reserves and Indicated Mineral Resources converting to Probable Ore Reserves after due consideration of all Modifying Factors as described in the JORC Code.
	• The results reflect the Competent Persons view of the Central Lode and TSF1 OREs.
	• No portion of Probable Reserves is derived from Measured Resources.
Audits or Reviews	• The prior ORE estimates have been reviewed in 2018 at a high level by Behre Dolbear Australia Pty Ltd (BDA), who concluded that the estimates are consistent with the requirements of the prevailing JORC Code and that reasonable prospects of eventual economic extraction had been demonstrated.

#### SECTION 4: ESTIMATION AND REPORTING OF ORE RESERVES

Criteria	Commentary
•	In 2019 and 2020, Snowden Mining Industry Consultant reviewed the estimates and concluded there were no fatal flaws in the prior ORE processes applied for the Central Lode and TSF1 and the estimates were generally low risk.
•	In December 2021, fatal flaw review prepared by resource and mining consultants RSC found no fatal flaws in Talison's method of preparation or reporting of the August 2021 MRE and ORE.
•	In December 2021, review of the mine design for the Central Lode – Kapanga Pit by geotechnical consultants PSM found the pit design largely compliant with prior design recommendations, with suggestions as to some minor revisions related to small local areas of potential higher failure risk related to steeper than recommend over slopes and the presence of underground workings.
•	BDA in a 2021 review for a Tianqi Prospectus, stated that planned mining rates and mining recovery factors are an acceptable basis for future planning, and that geotechnical conditions are good. BDA also reported that Talison's planned expansions are practical and achievable at low risk give planned replication of existing facilities in which Talison has developed significant expertise. Additionally, BDA stated that it could see no reason that future development applications for the operation would not be forthcoming.
Discussion of Relative Accuracy/ • Confidence	No specified statistical studies have been completed to quantify the estimation precision of either the Central Lode or TSF estimates.
	The August 2021 OPE is undermined by a new block model

• The August 2021 ORE is underpinned by a new block model which has been calibrated to historical mine to mill reconciliations and therefore no factors have been applied to neither tons nor grade.

### CUOLA PROJECT MINERAL RESOURCE STATEMENT JORC CODE-CHECK LIST OF ASSESSMENT AND REPORTING CRITERIA, TABLE 1

#### JORC CODE 2012 EDITION TABLE 1 FOR CUOLA LITHIUM PROJECT, SICHUAN, CHINA

#### SECTION 1: SAMPLING TECHNIQUES AND DATA

Criteria	Commentary
Sampling Techniques	Primary sampling for the Cuola lithium project was completed using diamond core drilling; this was supplemented with surface trench channel sampling. Core sample intervals were determined by geological logging of the core, generally for all the pegmatite intercepts. Sampling length varies from 0.5m to 2.0m, averaging around 1m, honouring the geology. Surface trenches were dug by excavators (about 80%) or by hand (about 20%). Trenches were generally dug in the direction perpendicular to the pegmatite veins and to the depth of the fresh bedrock to reveal the contact of pegmatite veins with schist wall rocks. Surface trench channel samples were collected generally from the trench bottom; sample channels were generally 10cm wide and 5cm deep; sample interval was generally 1-2m, honouring the geology.
Drilling Techniques	Core drilling was conducted by Chinese made drill rigs. The drill hole size is mostly 75mm in diameter with a recovered drill core size of 56mm, which is considered a reasonable core size to collect a good sample for grade analysis.
Drill Sample Recovery	Drill core recoveries for each drill run were determined during geological logging. Core recoveries were generally reasonably good, with a range from 80.3% to 99.8%, averaging 91.7%, for the entire hole and a range of 82.1% to 100.0%, averaging 92.3%, for the pegmatite intervals.
Logging	Drill core for each hole was logged by a geologist on site. Drilled length, drill core length, remaining unrecovered core length, and core recovery for each drill run was recorded; lithology, mineralization and structural information of the core were logged and recorded in detail. Each individual core box was photographed before sampling and the photos were kept in a digital database for future reference and verification.
Sub-sampling Techniques and Sample Preparation	Core samples were collected by a mechanical core splitter by splitting the core in the middle to separate the core into two halves. One half of the core was collected as samples for grade analysis, and the other half was stored in the original core box for future verification, check sampling, metallurgical test sampling,
#### SECTION 1: SAMPLING TECHNIQUES AND DATA

Criteria	Commentary
	and any other relevant studies. Samples were trucked to the primary analytical laboratory, the West-South Metallurgical Geology Analytical and Test Centre ("West-South Test Centre") located in Pi County, Sichuan Province, which is authenticated in metrology by Certification and Accreditation Administration of China and also holds a Class A qualification certificate issued by the Land and Resource Ministry of China, for grade analysis. Sample preparation was conducted by the West-South Test Centre. All samples were crushed, ground and split according to a standard procedure. A 50g pulp sample was produced for grade analysis. A duplicate pulp sample and the coarse rejects were sent back to Tianqi Shenghe for future verification grade analysis and metallurgical testing work.
Quality of Assay Data and Laboratory Tests	Sample analysis was conducted by the West-South Test Centre. Samples were dissolved by a mixture of nitric acid, hydrofluoric acid and perchloric acid, and were analysed by the Inductively Coupled Plasma-Atomic Emission Spectrometry ("ICP-AES") method for $\text{Li}_2\text{O}$ , $\text{Nb}_2\text{O}_5$ , $\text{Ta}_2\text{O}_5$ , and BeO. Each sample was also analysed for Sn by the oscillopolarography method. Quality assurance/quality control (QA/QC) for sample analysis was carried out by internal check analysis (duplicate sample analysis by the original analytical laboratory), external check analysis (check sample analysis by an independent secondary analytical laboratory) and inserting analytical standards in each batch of the samples. Three blind standard samples were included in each butch of 10 samples to monitor the accuracy of the analytic results. The analytical results of the standards show the analyses are within an acceptable variation range of the standard sample grades.
Verification of Sampling and Assaying	In order to independently verify the reliability of Tianqi Shenghe's sample $Li_2O$ grade, BDA took 20 randomly-selected check samples from the duplicate pulp samples from Tianqi Shenghe's warehouse. These samples were given new BDA sample numbers and were submitted to the West-South Test Centre for $Li_2O$ grade analysis. Analytical results show that the average $Li_2O$ grade of the BDA check samples is 0.933%, which is only approximately 1% below the average $Li_2O$ grade of the original samples of 0.942%. Reasonable correlation was shown by a scatter plot comparing the BDA check sample grade and the original sample grade. BDA considers that the BDA check samples generally confirm the original sample grades.
Location of Data Points	Drill hole collar location was surveyed after drilling; drill hole down-hole deviation was also surveyed by a down-hole survey instrument at an interval of approximately 50m as well as at the

#### SECTION 1: SAMPLING TECHNIQUES AND DATA

Criteria	Commentary
	bottom of the drill hole; drill hole length recorded by the driller was verified by actual measurement at the same time as the down- hole deviation survey. Surface trench locations were surveyed. A 1:10,000 scale surface geological map was completed for the entire Cuola Project exploration licence area; a more detailed 1:2,000 scale geological map was also completed for the north- western portion of the Cuola Project exploration licence area, where the majority of the Type IV spodumene pegmatite veins are located. The topography was resurveyed in detail and all geological mapping, drilling and trenching activities were conducted based on the new topographic maps.
Data Spacing and Distribution	Sampling covers all the identified spodumene pegmatite veins in the deposit at drill hole/Channel spacing (generally 20m to 60m) appropriate to estimate mineral resources for this type of lithium deposit.
Orientation of Data in Relation to Geological Structure	BDA notes that because of the limitation of drill rigs used for the exploration work by the No.108 Brigade at the time of the drilling, most of the holes were drilled at an angle of 80°, which is less than ideal for the generally steep-dipping spodumene pegmatite veins in the Cuola Project area as the location and thickness of the veins may not be determined accurately when the intersection angle of drill hole with the pegmatite veins is relatively small. However, the nearly horizontal surface trench samples have partially compensated this problem. Because of this orientation limitation, BDA has downgraded the Measured Resource in the original estimate to Indicated Resource for the Cuola Project. BDA recommends the use of more modern drill rigs capable of drilling lower angles for any further drilling for the Cuola Project.
Sample Security	Core samples and surface trench channel samples were transported to the analytical laboratory by truck by the No.108 Brigade with a detailed list of samples. A receipt was provided upon receiving the sample shipment.
Audits or Reviews	BDA reviewed the exploration data and the protocols followed during the drilling and determined that the data presented were generally adequate to support the reported Mineral Resource determinations for the Cuola Project.

## **COMPETENT PERSON'S REPORT**

## JORC CODE 2012 EDITION TABLE 1 FOR CUOLA LITHIUM PROJECT, SICHUAN, CHINA

#### SECTION 2: REPORTING OF EXPLORATION RESULTS

Criteria	Commentary
Mineral Tenement and Land Tenure Status	Tianqi Shenghe acquired the exploration licence for the Cuola Project through auction in October 2008. The licence number was T51320081203021204 with an area of 23.77km <sup>2</sup> . The licence area was defined by six inflection points. After a systematic exploration program conducted from 2009 to 2011, the Mineral Resources were well defined for the project, and related technical and mining studies have been conducted subsequently. Tianqi Shenghe received a mining licence with an area of 2.069km <sup>2</sup> for the Cuola Project on April 6, 2012. The licence number is C5100002012045210124005 and is valid until April 6, 2032; the licence is extendable afterwards. The licence area is separated into four zones with a total of 44 inflection points; these four zones cover all the identified spodumene pegmatite veins with lithium mineral resources within the original exploration licence boundary. The elevation range for the permitted mining area is from 4,100m to 4,580m. The licence allows Tianqi Shenghe to conduct a mining operation at a production rate of 1.2Mtpa. After receiving the mining licence, the original exploration licence for the Cuola Project was relinquished.
Exploration Done by Other Parties	Lithium mineralisation hosted by granitic pegmatite veins in the Jiajika District was first found in the early 1960s by the Ganzi Geological Exploration Brigade of the Geology Bureau of Sichuan Province. Initial systematic exploration work for the Jiajika District was conducted by the No.404 Geological Exploration Brigade of the Bureau of Geology and Mineral Resources of Sichuan Province from 1965 to 1974. A total of 498 granitic pegmatite veins were identified distributed around a granite intrusive, of which 114 veins contains significant lithium mineralisation. The Jiajika District was divided into five sections. The Cuola Project area contains most of the West and Central Sections as well as part of the South Section, North Section and East Section. The currently-operating Jiajika Mine is located in the East Section. The early exploration work was generally focused on the East Section and only limited work was conducted on other sections.
Geology	The Cuola Project area is located on the western limb of the Jiajika dome-shaped anticline and near to the anticlinal core. Fault structures are generally not well developed in the area, but fractures in the north-eastern and north-western directions (X-shaped steep-dipping shear fractures) are well developed and control the distribution of the spodumene pegmatite veins in the project area.

#### SECTION 2: REPORTING OF EXPLORATION RESULTS

#### Commentary

The Jiajika Granite intruded into the southwest portion of the Jiajika dome-shaped anticline core. The erosion depth is relatively shallow and only the fine-grained boundary phase rock is exposed. The rock consists of mostly microcline, albite-oligoclase and quartz with smaller amounts of muscovite and biotite and trace amounts of tournaline, apatite, spodumene, garnet, zircon, titanite, rutile, diopside, epidote, hornblende, pyrite, magnetite, ilmenite and molybdenite. The rock is high in silica (more than 70%), low in Ca, Mg and Fe, and rich in rare metals and volatile elements, with Li content up to 0.06-0.15%.

The pegmatite veins in the Cuola Project area are believed to be the product of crystallisation differentiation of the Jiajika Granite. Different types of pegmatite veins are distributed in concentric zones surrounding the granite intrusion with Type I microcline pegmatite veins generally within the intrusive body, Type II microcline-albite pegmatite veins and Type III albite pegmatite veins in schists near the intrusive contact zone, and Type IV spodumene pegmatite veins, Type V muscovite pegmatite veins and quartz veins further out from the contact zone. The pegmatite veins generally have similar chemical composition as the granite, with higher rare-metal and volatile contents, indicating that the pegmatite veins and the granite might have developed from the same magma source.

A total of 148 pegmatite veins have been identified within the Cuola Project exploration licence area, of which 20 are Type IV spodumene pegmatite veins.

The relatively large No.632, No.602, No.603, No.593 and No.60 pegmatite veins and No.594 pegmatite vein group occur in the west portion of the Jiajika District, around the Cuola Lake, at a distance of 2,000-3,000m from the Jiajika Granite intrusion; these spodumene pegmatite veins form the West Section of the Jiajika District.

The No.104 vein is located south of the Jiajika Lake and east of the Jiajika Granite at a distance of about 70m from the intrusive contact; this pegmatite vein is part of the Central Section of the Jiajika District.

Criteria

#### SECTION 2: REPORTING OF EXPLORATION RESULTS

Commentary The No.668 vein is located at the outer contact zone southeast of the Jiajika Granite at a distance of 600-700m from the contact. It is parallel to the intrusive contact and is an important spodumene pegmatite vein in the South Section of the Jiajika District. Other smaller spodumene pegmatite veins identified are mostly located within the West Section of the Jiajika District. The spodumene pegmatite veins occur as single veins or vein groups. Individual spodumene pegmatite veins can be shaped as regular or irregular veins or lenses, beaded veins, branching and composite veins and tuberculiform veins. They generally infill fractures in the schists and are 2-35m wide and 85-760m long. The pegmatite veins generally dip to the west and northwest; but some of the veins also dip to the east, southeast and south. The veins generally have a high dip angle, but this varies along the dip direction and is locally overturned. The larger spodumene pegmatite veins in the Cuola Project area include the No.632, No.594 (separated into No.594W, No.594M and No.594E),

The Type IV spodumene pegmatite veins generally consist of 35-40% quartz, approximately 5% microcline, 35% albite, 10-20% spodumene, and 2-3% muscovite, with minor amounts of accessory minerals such as garnet, pyrite, aphrizite, apatite, and cassiterite. Spodumene is generally grey or greyish white, occasionally light green in colour. Its shape is platy, plate-columnar or acicular. The mineral generally occurs as fine crystals (1-4cm long and 0.2-0.5cm wide) with small amounts of smaller and larger crystals. The spodumene crystals generally occur perpendicular to the pegmatite vein walls with small amount at an angle to the walls.

No.60, No.602, No.603, No.593, No.668 and No.104 veins.

Based on sampling and analysis results, the average  $Li_2O$  grade of the Type IV spodumene pegmatite veins ranges from 1.21% to 1.47%  $Li_2O$ . These veins also contain some beryllium, niobium, tantalum and tin, but the grades are generally not high enough to warrant economic recovery at current technical and economic conditions. The  $Li_2O$  grade in the pegmatite veins is generally stable, but it can decrease to below the resource estimation cut-off grade of 0.5%  $Li_2O$  towards the ends of the veins along strike. There is commonly a thin low grade shell at the contact with the schist wall rock. The  $Li_2O$  grade also often decreases to below cut-off grade at depth.

Criteria

## SECTION 2: REPORTING OF EXPLORATION RESULTS

Criteria	Commentary
	For each individual spodumene pegmatite vein, at the schist-wall rock contact, there is commonly a 3-5cm wide fine-grained greisenisation zone (consisting of mostly quartz, muscovite and a small amount of feldspar) with very low lithium grade, followed by a 0.5-5m wide fine-grained pegmatite zone (consisting of mostly quartz, feldspar and a small amount of muscovite) with a low lithium grade. The middle zone of the vein is generally the fine- to medium-grained quartz-albite-spodumene pegmatite with a small amount of muscovite and tourmaline and good lithium grade
Drill Hole Information	The geological database used for current mineral resource estimation was all generated by systematic detailed exploration work completed from 2009 to 2011 by the No.108 Brigade.
	Surface trenching and drilling was conducted along exploration lines approximately perpendicular to the pegmatite vein strike designed for each individual pegmatite vein or vein group. The exploration line spacing is 80m for the larger and more regularly- shaped No.632 pegmatite vein and 40m for other smaller and/or less regularly-shaped pegmatite veins or vein groups. A total of 142 diamond drill holes with a total drilled length of 17,575m and a total of 136 surface trenches with a total excavated volume of 28,407m <sup>3</sup> were completed during the period, of which 132 drill holes and 125 trenches intercepted the spodumene pegmatite veins. Drill hole and trench spacing on cross sections were generally 20m to 60m.
Data Aggregation Methods	No drill hole intercepts are reported so this item is irrelevant.
Relationship between Mineralisation Widths and Intercept Lengths	The spodumene pegmatite veins were generally interpreted on cross sections with drill hole and surface trench sampling information. The mineralization widths were based on the interpreted veins and not based on the intercept lengths.
Diagrams	Surface geology maps and typical cross sections with drill hole/ trench information and interpreted spodumene pegmatite veins are included in the CPR.
Balanced Reporting	The Competent Person considers that the Mineral Resource estimates are based on all good available data and provide a balanced view of the deposits under consideration.

## **COMPETENT PERSON'S REPORT**

## JORC CODE 2012 EDITION TABLE 1 FOR CUOLA LITHIUM PROJECT, SICHUAN, CHINA

#### SECTION 2: REPORTING OF EXPLORATION RESULTS

Criteria	Commentary
Other Substantive Exploration Data	The exploration work completed in the 1960s and 1970s by the No.404 Brigade is considered not reliable because of the limitation of technologies for drilling, sampling and sample analysis at that time. Therefore, the drilling information from these earlier exploration programs were not used for current
	Mineral Resource estimation.
Further Work	No further exploration work was planned at this stage.

## **COMPETENT PERSON'S REPORT**

## JORC CODE 2012 EDITION TABLE 1 FOR CUOLA LITHIUM PROJECT, SICHUAN, CHINA

#### SECTION 3: ESTIMATION AND REPORTING OF MINERAL RESOURCES

Criteria	Commentary
Database Integrity	BDA reviewed all the drill hole logs, photographs for all the drill core, analytical certificates for all the analytic samples and the electronic database used for the No.108 Brigade's resource estimation. Comparison of original assay certificate and electronic database for randomly selected samples indicates that there were basically no data entry errors for the electronic database.
Site Visits	A site visit was conducted by BDA's Project Geologist and Competent Person to the Cuola Project in Yajiang County Sichuan Province and to the head office of Tianqi Shenghe in Chengdu, Sichuan from April 14-21, 2018. During the visit, BDA selectively checked the surface geology, located some of the drill holes and surface sample trenches for some of the primary spodumene pegmatite veins. BDA inspected the core storage facility and checked the stored core for some of the drill holes. BDA also visited the incomplete construction work at the project site. In Tianqi Shenghe's head office in Chengdu, BDA discussed the Cuola Project with Tianqi Shenghe's management and technical staff, interviewed the primary technical staff of the No.108 Brigade involved in the 2009- 2011 Cuola Project exploration work and confirmed that the No.108 Brigade did complete the exploration work and Mineral Resource estimates described in their exploration geology report. BDA did not make a site visit since 2018 because of the travel restriction caused by the pandemic in the past couple of years but reviewed a drone video taken in October 2021 by Tianqi Shenghe to confirm that there is no change for the status of the project.
Geological Interpretation	For the purpose of Mineral Resource estimation, all drilling and sampling data, along with other relevant geological information, were digitised into the MAPGIS software system by the No.108 Brigade. MAPGIS is a computer software system widely used in China for preparation of plans and sections for mineral resource estimation. Sections and plans used for the September 2011 Mineral Resource estimation of the Cuola Project were produced by MAPGIS. Based on the surface mapping, drilling and surface trench sampling, the spodumene pegmatite veins and relevant geological information were interpreted on the surface geology

#### **COMPETENT PERSON'S REPORT**

#### JORC CODE 2012 EDITION TABLE 1 FOR CUOLA LITHIUM PROJECT, SICHUAN, CHINA

### Criteria Commentary maps and cross sections. For smaller pegmatite veins, a projected long section interpretation was prepared. Dimensions The current Cuola Project mining licence has an area of 2.069km<sup>2</sup>. The spodumene pegmatite veins within the mining licence occur as single veins or vein groups. Individual spodumene pegmatite veins can be shaped as regular or irregular veins or lenses, beaded veins, branching and composite veins and tuberculiform veins. They generally infill fractures in the schists and are 2-35m wide and 85-760m long. The pegmatite veins generally dip to the west and northwest; but some of the veins also dip to the east, southeast and south. The veins generally have a high dip angle, but this varies along the dip direction and is locally overturned. Estimation and Modelling The parallel section method, a polygonal method based on Techniques projected cross sections, was used for the Mineral Resource estimation of the larger, more important spodumene pegmatite veins in the Cuola Project. Mineral resource estimation for other smaller and/or less important veins was estimated by the polygonal method on projected long sections. Moisture Tonnages were based on dry bulk density measurements and no moisture was included in the estimates. **Cut-off Parameters** Cut-off parameters used for the Mineral Resource estimates include a boundary cut-off grade of 0.5% Li<sub>2</sub>O, a block cut-off grade of 0.7% Li<sub>2</sub>O, and a deposit cut-off grade of 1.0% Li<sub>2</sub>O. A minimum mining width of 1m and a minimum waste exclusion width of 2m were also used for the estimates. Mining Factors or Assumptions No mining limiting factors other than the minimum mining width and minimum waste exclusion width stated above were considered in the Mineral Resource estimates. Mineral Resource estimates have been limited by the horizontal and vertical restrictions on the mining license. Metallurgical Factors or Tianqi Shenghe has conducted some metallurgical testing for the Assumptions Cuola Project spodumene ore samples, which indicates that spodumene can be effectively recovered in the selected metallurgical process.

#### SECTION 3: ESTIMATION AND REPORTING OF MINERAL RESOURCES

## **COMPETENT PERSON'S REPORT**

## JORC CODE 2012 EDITION TABLE 1 FOR CUOLA LITHIUM PROJECT, SICHUAN, CHINA

#### SECTION 3: ESTIMATION AND REPORTING OF MINERAL RESOURCES

Criteria	Commentary
Environmental Factors or	An environmental impact assessment report for the Phase I
Assumptions	600ktpa open-pit mining operation of the Cuola Project was completed by Sichuan Academy of Environmental Protection Science in December 2012, and the Cuola Phase I open-pit mining operation project was approved by Environmental Protection Department of Sichuan Province on February 26, 2013. The Cuola Project site is located at the south-eastern edge of the Qinghai- Tibet plateau at an elevation of over 4,000m and is in an environmentally sensitive area. It is important for Tianqi Shenghe to take appropriate measures for ecological conservation and to avoid any environmental pollution. Tianqi Shenghe's management and staff are all aware of the importance of environmental protection and ecological conservation.
Bulk Density	Spodumene pegmatite bulk density measurement samples were collected from drill cores and surface trenches for the Cuola Project. Bulk density of the dried samples was determined by the wax-coating, water-immersion method. The measurement results show that the bulk density ranges from $2.5t/m^3$ to $2.8t/m^3$ , with an average of $2.71t/m^3$ . The measurement results also show the bulk density of the spodumene pegmatite is slightly positively correlated with the sample Li <sub>2</sub> O grades. The average of the bulk density measurement results for each spodumene pegmatite vein was used as the bulk density of the vein in Mineral Resource estimation.
Classification	Mineral Resources were classified based on the drill hole/surface trench channel spacing for the Cuola Project. For the large No.632 pegmatite vein, Measured Resource was defined by drill hole/ channel spacing of no more than 80m × 40-60m; Indicated Resource was defined by a drill hole/channel spacing of no more than 160m × 60-80m; No extrapolation is allowed from a data point for the Measured and Indicated Resources; Inferred Resources was generally defined by a wider drill hole spacing or extrapolated 40m from the Measured/Indicated Resource blocks. For other smaller pegmatite veins, Measured Resource was defined by drill hole/channel spacing of no more than 40m × 15-20m; Indicated Resource was defined by a drill hole/channel spacing of no more than 80m × 30-40m; no extrapolation is allowed from a data point for the Measured and Indicated

## **COMPETENT PERSON'S REPORT**

## JORC CODE 2012 EDITION TABLE 1 FOR CUOLA LITHIUM PROJECT, SICHUAN, CHINA

#### SECTION 3: ESTIMATION AND REPORTING OF MINERAL RESOURCES

Criteria	Commentary
Criteria	Resources; Inferred Resources was generally defined by a wider drill hole spacing or extrapolated 40m from the Measured/ Indicated Resource blocks. As discussed previously, the surface drill holes were mostly drilled at a high angle of 80°, which is less than ideal for the steep-dipping spodumene pegmatite veins in the Cuola Project, as the thickness and location of the veins may not be determined accurately. Because of this limitation, BDA considers the Measured Resource blocks would be more
	appropriately classified as Indicated. For the purposes of this CPR, BDA has therefore reduced the confidence level of all the Measured Resource blocks in the original resource estimation and has reclassified them as Indicated Resources.
Audits or Reviews	Based on detailed review of the deposit geology, drilling and sampling data, and procedures and parameters used for the estimation of Mineral Resources, BDA is of the opinion that the Mineral Resources estimated by the No.108 Brigade under the 1999 Chinese mineral resource system for the Cuola Project, after reclassifying the Measured Resources to Indicated Resources, conforms appropriately to the equivalent JORC Mineral Resource categories. BDA signed-off the Mineral Resource estimates under 2012 JORC Code. The economic portion of the Indicated Resources can accordingly be used to estimate the Probable Ore Reserves for the Cuola Project.
Discussion of Relative Accuracy/ Confidence	There has been no mine production for the Cuola Project and the Mineral Resource estimates have not been verified by actual mine production. BDA believes that it is very important to reconcile the actual mining production with the Mineral Resource estimates in the future when mining starts for the project. The reconciliation result can be used to adjust the Mineral Resource estimates, if necessary, in the future.

# Section 4 (Estimation and Reporting of Ore Reserves) of the JORC Code Table 1 is not applicable as no Ore Reserves were reported for the Cuola Project in this CPR.

## **COMPETENT PERSON'S REPORT**

#### **APPENDIX III**

#### GLOSSARY

Term/Abbreviation	Description
2012 Act	Mining Rehabilitation Fund Act 2012
AAS	Atomic Absorption Spectroscopy
acQuire	acQuire Technology Solutions Pty Limited
ADB	Action Drill and Blast Pty Ltd
AIMVA	Australasian Institute of Minerals Valuers and Appraisers
Albermarle	Albermarle Corporation Inc.
AMSL	Above Mean Sea Level
AusIMM	Australasian Institute of Mining and Metallurgy
A\$	Australian Dollar
BeO	Beryllium Oxide
bcm	Bank Cubic Meter (in situ volume)
BDA	Behre Dolbear Australia Pty Limited
BD	Bulk Density
BMB	Balingup Metamorphic Belt
C1 Pit	Central Lode 1 Open Pit
C3 Pit	Central Lode 3 Open Pit
CG	Chemical Grade
CGP 1, 2, 3 and 4	Chemical Grade Plants 1, 2, 3, and 4
China	People's Republic of China
CMV	Certified Mineral Valuer
CPR	Competent Persons Report
CRM	Certified Reference Material
CSIRO	Commonwealth Scientific and Industrial Research Organization
Cuola Project	Cuola Lithium (Spodumene) Project
DBCA	WA Department of Biodiversity, Conservation and Attractions
DEC	WA Department of Environment and Conservation
DD	Diamond Drill
dia	Diameter
DIP	Deposit Industrial Parameters
DMP	WA Department of Minerals and Petroleum
DSO	Direct Shipping Ore
DWER	WA Department of Water and Environmental Regulations
DZ	Depleted Zone
EMS	Environmental Management System
Environmental Protection Act	Environmental Protection Act 1986 (WA)
EOML	End Of Mine Life
EPC	Engineering, Procurement and Construction Contract
EPCM	Engineering, Procurement and Construction Management
EZ	Enriched Zone
Fe <sub>2</sub> O <sub>3</sub>	Ferric Oxide
GAM	Global Advanced Metals Ltd
GAMG	Global Advanced Metals Greenbushes Pty Limited
Ganzi Prefecture	Ganzi Tibetan Autonomous Prefecture

## **COMPETENT PERSON'S REPORT**

Term/Abbreviation	Description
GHD	GHD Pty Limited
Greenbushes Mine	Greenbushes Lithium Mine
ha	Hectare
HARD	Half Absolute Relative Difference
HMS	Heavy Medium Separation
ICP-AES	Inductively Coupled Plasma-Atomic Emission Spectrometry
ID <sup>2</sup>	Inverse Distance Squared Technique
IGO	IGO Limited
IIMA	International Institute of Mineral Appraisers
IPO	Initial Public Offering
ISO	International Standards Organization
IVSC	International Valuation Standards Committee
Jiajika District	Jiajika Lithium Mineralisation District
Jiajika Granite	Jiajika Two-Mica Granite Stock
Jiajika Mine	Jiajika Lithium (Spodumene) Mine
Joint Venture	An Incorporated Lithium Joint Venture between Tianqi Lithium
	Corporation (51%) and IGO limited (49%),
JORC Code	Australasian Code for Reporting of Exploration Results, Mineral
	Resources and Ore Reserves" as Prepared by the Joint Ore
	Reserves Committee of the AusIMM, AIG, and the MCA
kg	Kilogram
km	Kilometer
km <sup>2</sup>	Square Kilometer
kt	Thousand Tons
ktpa	Thousand Tons per annum
kV	Kilovolts
Lanzhou Institute	Lanzhou Engineering & Research Institute of Nonferrous
	Metallurgy
LCE	Lithium Carbonate Equivalent
Li <sub>2</sub> O	Lithium Oxide
LOM	Life of Mine
L/s	Liters per Second
m	Meter
М	Million
m <sup>3</sup>	Cubic Meter
Ma	Million Years
Mbcm	Million Bank Cubic Meters
Mbcmpa	Million Bank Cubic Meters Per Annum
Mining Act	Mining Act 1978 (WA)
μm	Micron (m x 10 <sup>-6</sup> )
MnO	Manganese Oxide
mm	Millimeter
MRF	Mining Rehabilitation Fund
MSA	Mine Services Area
Mt	Million Tons
Mtpa	Million Tons Per Annum

## **COMPETENT PERSON'S REPORT**

Term/Abbreviation	Description
MW	Megawatt
Na <sub>2</sub> O	Sodium Oxide
Nb	Niobium
Nb <sub>2</sub> O <sub>5</sub>	Niobium Oxide
NI 43-101	Canadian Securities Administrators' National Instrument 43-
	101—Standards of Disclosure for Mineral Projects
NOI	Mining Notice of Intent
No.108 Brigade	No.108 Geological Exploration Brigade
No.404 Brigade	No.404 Geological Exploration Brigade
NPV	Net Present Value
ОК	Ordinary Kriging
PEM	Prospectivity Enhancement Multiplier
PLS	Pilbara Minerals Ltd
ppm	Parts Per Million
PRC	People's Republic of China
PSM	PSM Consult Pty Ltd
QA/QC	Quality Assurance/ Quality Control
QG	Quantitative Group Pty Limited
Q-Q Plot	Quantile-Quantile Plot
RC	Reverse Circulation
RCF	Resource Capital Fund
RL	Reduced Level
ROM	Run of Mine
RSC	RSC Mining and Mineral Exploration,
SC	Spodumene Concentrate
SEHK	Stock Exchange of Hong Kong Limited
SG	Specific Gravity
SGM	SG Mining Pty Ltd
Sn	Tin
SOG	Sons of Gwalia Ltd
SQM	Sociedad Quimica y Minera de Chile SA
SRK	SRK Consulting (Australasia)
SRK (NA)	SRK Consulting (North America)
t	Tonne
t/m <sup>3</sup>	Tons per Cubic Meter
Та	Tantalum
$Ta_2O_5$	Tantalum Oxide
Talison	Talison Lithium Limited
TG	Technical Grade
TGP	Technical Grade Plant
The Listing Rules	The Stock Exchange of Hong Kong Listing Rules
Tianqi	Tianqi Lithium Corporation
Tianqi Shenghe	Tianqi Shenghe Lithium Company Ltd
TLA	Talison Lithium (Australia) Pty Limited
tpa	Tons Per Annum
tph	Tons Per Hour
TRP	Tailings Retreatment Plant
T <sub>3</sub> xd	Triassic Xinduqiao Formation

## **COMPETENT PERSON'S REPORT**

Term/Abbreviation	Description
T <sub>3</sub> zh	Triassic Zhuwo Formation
TSF 1, 2, 3 and 4	Tailings Storage Facility 1, 2, 3 and 4
U	Uranium
US\$/t	US Dollar Per Ton
VALMIN Code	Code for the Technical Assessment and Valuation of Mineral and
	Petroleum Assets and Securities for Independent Expert Reports
VAT	Value Added Tax
VWP	Vibrating Wire Piezometer
WA	Western Australia
WACC	Weighted Average Cost of Capital
West-South Test Center	West-South Metallurgical Geology Analytical and Test Center
WHIMS	Wet High Intensity Magnetic Separation
Wood Mackenzie	Wood Mackenzie (Asia Pacific) Pty Limited
WTP	Water Treatment Plant
XRF	X-Ray Fluorescence