Exhibit 96.1

SEC Technical Report Summary
Pre-Feasibility Study
Greenbushes Mine
Western Australia

Effective Date: June 30, 2021
Report Date: January 28, 2021

Report Prepared for

Albemarle Corporation

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Table of Contents

List of Tables

List of Figures

List of Abbreviations

The metric system has been used throughout this report. Tonnes are metric of 1,000 kg, or 2,204.6 lb. All currency is in U.S. dollars (US$) unless otherwise stated.

Abbreviation	Unit or Term
A	ampere
AA	atomic absorption
A/m^2	amperes per square meter
ANFO	ammonium nitrate fuel oil
Ag	silver
Au	gold
AuEq	gold equivalent grade
°C	degrees Centigrade
CCD	counter-current decantation
CIF	cost-insurance-freight
CIL	carbon-in-leach
CoG	cut-off grade
cm	centimeter
cm^2	square centimeter
cm^3	cubic centimeter
cfm	cubic feet per minute
ConfC	confidence code
CRec	core recovery
CSS	closed-side setting
CTW	calculated true width
°	degree (degrees)
dia.	diameter
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
FA	fire assay
ft	foot (feet)
ft^2	square foot (feet)
ft^3	cubic foot (feet)
g	gram
gal	gallon
g/L	gram per liter
g-mol	gram-mole
gpm	gallons per minute
g/t	grams per tonne
ha	hectares
HDPE	Height Density Polyethylene
hp	horsepower
HTW	horizontal true width
ICP	induced couple plasma
ID2	inverse-distance squared
ID3	inverse-distance cubed
IFC	International Finance Corporation
ILS	Intermediate Leach Solution
kA	kiloamperes
kg	kilograms
km	kilometer
km^2	square kilometer
koz	thousand troy ounce
kt	thousand tonnes
kt/d	thousand tonnes per day
kt/y	thousand tonnes per year
kV	kilovolt

kW	kilowatt
kWh	kilowatt-hour
kWh/t	kilowatt-hour per metric tonne
L	liter
L/sec	liters per second
L/sec/m	liters per second per meter
lb	pound
LHD	Long-Haul Dump truck
LLDDP	Linear Low Density Polyethylene Plastic
LOI	Loss On Ignition
LoM	Life-of-Mine
m	meter
m^2	square meter
m^3	cubic meter
masl	meters above sea level
MARN	Ministry of the Environment and Natural Resources
mg/L	milligrams/liter
mm	millimeter
mm^2	square millimeter
mm^3	cubic millimeter
MME	Mine & Mill Engineering
Moz	million troy ounces
Mt	million tonnes
MTW	measured true width
MW	million watts
m.y.	million years
NGO	non-governmental organization
NI 43-101	Canadian National Instrument 43-101
OSC	Ontario Securities Commission
oz	troy ounce
%	percent
PLC	Programmable Logic Controller
PLS	Pregnant Leach Solution
PMF	probable maximum flood
ppb	parts per billion
ppm	parts per million
QA/QC	Quality Assurance/Quality Control
RC	rotary circulation drilling
RoM	Run-of-Mine
RQD	Rock Quality Description
SEC	U.S. Securities & Exchange Commission
sec	second
SG	specific gravity
SPT	standard penetration testing
st	short ton (2,000 pounds)
t	tonne (metric ton) (2,204.6 pounds)
t/h	tonnes per hour
t/d	tonnes per day
t/y	tonnes per year
TSF	tailings storage facility
TSP	total suspended particulates
µm	micron or microns
V	volts
VFD	variable frequency drive
W	watt
XRD	x-ray diffraction
y	year

1 Executive Summary

This report was prepared as a Prefeasibility-level Technical Report Summary in accordance with the Securities and Exchange Commission (SEC) S-K regulations (Title 17, Part 229, Items 601 and 1300 until 1305) for Albemarle Corporation (Albemarle) by SRK Consulting (U.S.), Inc. (SRK) on the Greenbushes Mine (Greenbushes).

Greenbushes is held within the operating entity, Talison Lithium Australia Pty Ltd (Talison), of which Albemarle is a 49% owner with the remaining 51% ownership controlled by a Joint Venture (Tianqi/IGO JV) between Tianqi Lithium (Tianqi) and IGO Ltd (IGO) with ownership of 26.01% and 24.99% respectively.

SRK’s reserve estimate is based on the production of chemical grade spodumene concentrate from three existing processing facilities, the two existing chemical grade plants (CGP1 and CGP2) as well as the existing technical grade (TGP) spodumene plant. Talison’s future production from the technical grade plant is planned to target technical grade spodumene products. However, classification of resource applicable for processing as technical grade product does not occur until the grade-control drilling stage and therefore adequate data is not available to characterize production from this plant as technical grade for this reserve estimate. Instead, production from this plant has been assumed as lower value (on average) chemical grade product.

Talison recently constructed a processing facility to recover lithium from historic tailings (tailings retreatment plant or TRP). SRK has excluded the TRP from its reserve estimate due to limited materiality and technical data underlying resource and production assumptions. Finally, Talison has also proposed further expansion of chemical grade processing facilities (referred to as CGP3 and CGP4) which have also been excluded from the analysis due to uncertainty on future development timing. These exclusions are discussed further in the report in Section 2 and 21.

1.1 Property Description (Including Mineral Rights) and Ownership

The Greenbushes property is a large mining operation located in Western Australia extracting lithium and tantalum products from a pegmatite orebody. In addition to being the longest continuously operated mine in Western Australia, the Greenbushes pegmatite is one of the largest known spodumene pegmatite resources in the world. The Greenbushes Lithium Operations property area is approximately 2,000 ha, which is a smaller subset of a larger 10,067 ha land package controlled by Talison. Talison holds 100% of 10,067 Ha of mineral tenements which cover the Greenbushes Lithium Operations area and surrounding exploration areas.

1.2 Geology and Mineralization

The Greenbushes pegmatite deposit consists of a primary pegmatite intrusion with numerous smaller, generally linear pegmatite dikes and pods to the east. The primary intrusion and its subsidiary dikes and pods are concentrated within shear zones on the boundaries of granofels, ultramafic schists and amphibolites. The pegmatites are crosscut by ferrous-rich, mafic dolerite which is of paramount importance to the current mining methods. The pegmatite body is over 3 km long (north by northwest), up to 300 m wide (normal to dip), strikes north to north-west and dips moderately to steeply west to south-west.

Overall, the Greenbushes pegmatite averages approximately 2% Li_2O. Major minerals are quartz, spodumene, albite and K-feldspar. Primary lithium minerals are spodumene, $LiAlSi_2O_6$ (~8% Li_2O) and spodumene varieties kunzite and hiddenite. Minor lithium minerals include lepidolite (mica), amblygonite and lithiophilite (phosphates).

1.3 Status of Exploration, Development and Operations

SRK notes that the property is an active mining operation with a long and robust history, and that results and interpretation from exploration data is generally supported in more detail by extensive drilling and by active mining exposure of the orebody in multiple pits. The area around the current Greenbushes Lithium Operations has been extensively mapped, sampled, and drilled over several decades of exploration work. For the purposes of this report, the active mining, extensive exploration drilling, and in-pit mapping should be considered the most relevant and robust exploration work for the current mineral resource estimation.

1.4 Mineral Resource and Mineral Reserve Estimates

1.4.1 Mineral Resources

The Mineral Resource Estimate (MRE) discussed herein remains based on information which has not materially changed since disclosure on June 30, 2020. SRK notes that very limited additional drilling has been added in the subsequent 12 months, and as of the effective date of June 30, 2021, no update to the MRE was conducted due to lack of material change to the Central Lode data. The mineral resource statement has been updated to reflect revised pit optimization parameters for the June 30, 2021 effective date. These may reflect adjustments in economics, pit slope angles, or other factors which have not modified the input data such as drilling, geology models, or block models. The nearby Kapanga deposit was developed further by Talison and is expected to feature in future disclosure.

Mineral resources have been estimated by SRK and are based on a spodumene concentrate sales price of US$750/t of concentrate CIF China (or US$672/t of concentrate at the mine gate after deducting for transportation and government royalty). SRK generated a 3D geological model informed by various data types (primarily drilling and pit mapping) to constrain and control the shapes of the pegmatite bodies which host the Li_2O. Drilling data from the exploration data set was composited within relevant geological wireframes, and Li_2O grades were interpolated into a block model using ordinary kriging methods. Results were validated visually, via various statistical comparisons, and against recent reconciliation data. The estimate was depleted for current production, categorized in a manner consistent with industry standards, and reviewed with Talison site personnel. Mineral resources have been reported using an optimized pit shape, based on economic and mining assumptions to support the reasonable potential for eventual economic extraction of the resource. A cut-off grade has been derived from these economic parameters, and the resource has been reported above this cut-off. Current mineral resources, exclusive of reserves, are summarized in Table 1-1.

Table 1-1: Greenbushes Summary Mineral Resources Exclusive of Mineral Reserves as of June 30, 2021 Based on US$672/t of Concentrate at Mine Gate– SRK Consulting (U.S.), Inc.

Area	Category	100% Tonnes (Mt)	Attributable Tonnes (Mt)	Li_2O (%)	Cut-Off (% Li_2O)	Mass Yield	100% Concentrate Tonnes @ 6.0% Li_2O (Mt)	Attributable Concentrate Tonnes @ 6% Li_2O (Mt)
Resource Pit 2021	Indicated	31.8	15.6	1.54	0.57	17.2%	5.5	2.7
	Inferred	23.9	11.7	1.05	0.57	10.3%	2.5	1.2
Reserve Pit 2021 *	Indicated	2.6	1.3	0.60	0.57-0.70	5.2%	0.1	0.1
	Inferred	16.8	8.2	1.05	0.57-0.70	10.4%	1.8	0.9
Stockpiles	Inferred	0.3	0.1	1.40	0.50	15.0%	0.04	0.02

Source: SRK, 2021

- Albemarle's attributable portion of mineral resources and reserves is 49%.
- Mineral resources are reported exclusive of mineral reserves. Mineral resources are not mineral reserves and do not have demonstrated economic viability.
- Resources have been reported as in situ (hard rock within optimized pit shell) and stockpile (mined and stored on surface as blasted/crushed material).
- Resources have been categorized subject to the opinion of a QP based on the amount/robustness of informing data for the estimate, consistency of geological/grade distribution, survey information, and have been validated against long term mine reconciliation for the in-situ volumes.
- Resources which are contained within the mineral reserve pit design may be excluded from reserves due to an Inferred classification or because they sit in the incremental COG range between the resource and reserve COG. They are disclosed separately from the resources contained within the Resource Pit. There is reasonable expectation that some Inferred resources within the mineral reserve pit design may be converted to higher confidence materials with additional drilling and exploration effort.
- All Measured and Indicated Stockpile resources have been converted to mineral reserves.
- Mineral resources are reported considering a nominal set of assumptions for reporting purposes:
  - Mass Yields for chemical grade material are based on Greenbushes CGP1 LOM feed mass yield formula. For the LoM material, mass yield is assumed at 29.49% and is subject to a 97% recovery limitation when the lithium oxide grade exceeds 5.5%. Mass yield varies as a function of grade, and may be reported herein at lower mass yields than the CGP1 average.
  - Pit optimization and economics for derivation of CoG include mine gate pricing of US$672/t of 6% Li_2O concentrate, US$ 4.75/t mining cost (LoM average cost-variable by depth), US$ 17.87/t processing cost, US$ 4.91/t G&A cost, and US$ 2.66/t sustaining capital cost.
  - Costs estimated in Australian Dollars were converted to US Dollars based on an exchange rate of 0.76AU$:1.00US$.
  - These economics define a CoG of 0.573% Li_2O.
  - An overall 43% pit slope angle, 0% mining dilution, and 100% mining recovery.
  - Resources were reported above this 0.573% Li_2O CoG and are constrained by an optimized break-even pit shell.
  - No infrastructure movement capital costs have been added to the optimization.
  - Stockpile resources have been previously mined between nominal CoG's of 0.5 to 0.7% Li_2O.
- Mineral resources tonnage and contained metal have been rounded to reflect the accuracy of the estimate, and numbers may not add due to rounding.
- SRK Consulting (U.S.) Inc. is responsible for the mineral resources with an effective date: June 30, 2021.

1.4.2 Mineral Reserve Estimate

The conversion of mineral resources to mineral reserves has been completed in accordance with United States Security and Exchange Commission (SEC) regulations CFR 17, Part 229 (S-K 1300). Mineral reserves were determined based on a spodumene concentrate sales price of US$650/t of concentrate CIF China (or US$577/t of concentrate at the mine gate after deducting for transportation and government royalty). The mineral reserves are based on PFS level study as defined in §229.1300 *et seq*.

The mineral reserve calculations for the Greenbushes Central Lode lithium deposit have been carried out by a Qualified Person as defined in §229.1300 et seq. SRK Consulting (U.S.) Inc. is responsible for the mineral reserves reported herein. Table 1-2 shows the Greenbushes mineral reserves with an effective date of June 30, 2021.

Table 1-2: Greenbushes Summary Mineral Reserves at June 30, 2021 Based on US$577/t of Concentrate Mine Gate – SRK Consulting (U.S.), Inc.

Classification	Type	100% Tonnes (Mt)	Attributable Tonnes (Mt)	Li_2O%	Mass Yield (%)	100% Concentrate (Mt)	Attributable Concentrate (Mt)
Probable Mineral Reserves	In situ	138.1	67.7	1.97	22.6%	31.3	15.3
	Stockpiles	4.6	2.3	1.31	13.4%	0.6	0.3
	In situ + Stockpiles	142.7	69.9	1.95	22.3%	31.9	15.6

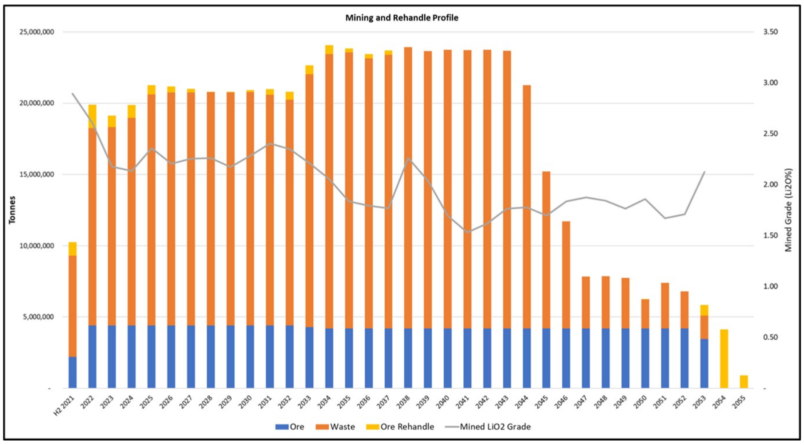
Source: SRK, 2021

- Albemarle's attributable portion of mineral resources and reserves is 49%.
- Mineral reserves are reported exclusive of mineral resources.
- Indicated in situ resources have been converted to Probable reserves.
- Measured and Indicated stockpile resources have been converted to Probable mineral reserves.
- Mineral reserves are reported considering a nominal set of assumptions for reporting purposes:
    - Mineral reserves are based on a mine gate price of US$577/t of chemical grade concentrate (6% Li_2O).
    - Mineral reserves assume 80% mining recovery for ore/waste contact areas and 100% for non-waste contact material
    - Mineral reserves are diluted at approximately 20% at zero grade for ore/waste contact areas in addition to internal dilution built into the resource model (2.7% with the assumed selective mining unit of 5 m x 5 m x 5 m)
    - The mass yield (MY) for reserves processed through the chemical grade plants is estimated by the based on Greenbushes' mass yield formula and the LoM mass yield is 29.49% subject to a 97% recovery limitation when the lithium oxide grade exceeds 5.5%.
    - The mass yield (MY) for reserves processed through the chemical grade plant CGP2 in the next three to four years is estimated by the based on Greenbushes' mass yield formula for a LoM mass yield of 16.77%, and is subject to a 97% recovery limitation when the lithium oxide grade exceeds 5.5%. The CGP2 plant is going through a ramp up period where lower recoveries are expected until all equipment has been optimized and additional capital is spent.
    - The mass yield (MY) for reserves processed through the technical grade plant is estimated by the based on Greenbushes' mass yield formula and the LoM mass yield is 46.18%. There is approximately 3.5 Mt of technical grade plant feed at 4% Li_2O
    - Although Greenbushes produces a technical grade product from the current operation, it is assumed that the reserves reported herein will be sold as a chemical grade product. This assumption is necessary because feed for the technical grade plant is currently only defined at the grade control or blasting level. Therefore, it is conservatively assumed that concentrate produced by the technical grade plant will be sold at the chemical grade product price
    - Pit optimization and economics for derivation of CoG include mine gate pricing of US$577/t of 6% Li_2O concentrate, US$ 4.75/t mining cost (LoM average cost-variable by depth), US$ 17.87/t processing cost, US$ 4.91/t G&A cost, and US$ 2.66/t sustaining capital cost. The mine gate price is based on US$650/t-conc CIF less US$73/t-conc for government royalty and transportation to China.
    - Costs estimated in Australian Dollars were converted to US Dollars based on an exchange rate of 0.76AU$:1.00US$.
    - The price, cost and mass yield parameters, along with the internal constraints of the current operations, result in a mineral reserves CoG of 0.7% Li_2O.
    - The CoG of 0.7% Li_2O was applied to reserves that are constrained by the ultimate pit design and are detailed in a yearly mine schedule
    - Stockpile reserves have been previously mined and are reported at a 0.7% Li_2O CoG
- Waste tonnage within the reserve pit is 459 Mt at a strip ratio of 3.32:1 (waste to ore – not including reserve stockpiles)
- Mineral reserve tonnage, grade and mass yield have been rounded to reflect the accuracy of the estimate, and numbers may not add due to rounding
    - Mt = millions of metric tonnes
    - Reserve tonnes are rounded to the nearest hundred thousand tonnes
- SRK Consulting (U.S.) Inc. is responsible for the mineral reserves with an effective date: June 30, 2021

1.5 Mining Operations

Greenbushes is an operating mine that uses conventional open pit methods to extract mineral reserves containing economic quantifies of Li_2O to produce both chemical and technical grade spodumene concentrates. Drilling, blasting, and load and haul activities are performed by contractors. Grade control is performed with reverse circulation (RC) drills that sample on 2.5 m intervals. In ore areas, mining occurs on 5 m benches and in waste areas, 10 m benches are used. Ore is hauled to the RoM pad or to long-term ore stockpiles. Waste rock is hauled to a waste dump adjacent to the open pit.

The life-of-mine (LoM) production profile is shown in Figure 1-1. The peak annual material movement is approximately 24 Mt and mining spans approximately 32 years (or approximately 35 years when including the processing of low-grade stockpiles at the end of the mine life). The LoM average strip ratio (w:o) is 3.32.



Source: SRK, 2021

Figure 1-1: Mine Production Profile

1.6 Mineral Processing and Metallurgical Testing

Greenbushes operates Chemical Grade Plant Number 1 (CGP1) to recover a spodumene from ore containing about 2.5% Li_2O into lithium concentrates containing about 6% Li_2O. The CGP1 process flowsheet utilizes unit operations that are standard to the industry including: ball mill grinding, heavy media separation (HMS), wet high intensity magnetic separation (WHIMS), coarse mineral flotation and conventional fine mineral flotation. In addition, Greenbushes completed the construction of Chemical Grade Plant Number 2 (CGP2) during 2019 and has initiated commissioning of this facility.

As part of the process design for CGP2, Greenbushes conducted an evaluation of the use of high pressure grinding rolls (HPGR) as an alternative to the ball mill grinding circuit currently used in CGP1. The HPGR was determined by Greenbushes to generate fewer non-recoverable fines (less than 45 µm) and offer the potential of improving overall lithium recovery. The results of this evaluation indicated the following benefits associated with the use of a HPGR instead of ball mill grinding in CGP2:

- Reduction in over-grinding of spodumene enables a reduction in lithium losses with the slimes.
- Better liberation of spodumene in coarse size fractions for improved HMS performance.
- Better liberation of spodumene in the fine fractions.
- Selectively grinding softer minerals than spodumene to a fine size. Iron minerals are therefore concentrated in the fine fractions where they are easier to remove in WHIMS.

- HPGR is easier to adjust on-line to suit variations in ore hardness compared to a ball mill circuit.

Greenbushes used a combination of size distributions, Li_2O analysis of size fractions and liberation data to estimate the yield and lithium recovery that could result by using an HPGR instead of conventional ball mill grinding in the comminution circuit. This resulted in the development of a yield model that estimates incrementally higher lithium recovery in CGP2, which is attributed to HPGR comminution instead of ball mill grinding as practiced in CGP1. This additional lithium recovery has not yet been demonstrated during CGP2 commissioning.

1.7 Processing and Recovery Methods

Greenbushes currently has two ore crushing facilities (CR1 and CR2) and three ore processing plants which include a technical grade plant (TGP), chemical grade plant-1 (CGP1) and chemical grade plant-2 (CGP2) with a nominal capacity of 4.5 Mt/y of pegmatite feed to produce a nominal 1.3 Mt/y of spodumene concentrate. TGP is a relatively small plant that processes approximately 350,000 t/y of ore at an average grade of about 3.8% Li_2O and produces about 150,000 t of spodumene concentrate products. TGP produces a variety of product grades identified as SC7.2, SC6.8, SC5.5 and SC5.0.

During the period of 2017 to 2021 (Jan-Sept) ore tonnes processed in TGP ranged from 232,055 to 373,643 t and ore grades ranged from 3.72 to 3.96% Li_2O. Overall lithium recovery ranged from 68.8 to 75.1% into six separate products. Overall mass yield during this period ranged from 38.4 to 44.9%.

CGP1 and CGP2 process spodumene ore into lithium concentrates containing a minimum of 6% Li_2O and a maximum iron content of 1% iron oxide (Fe_2O_3). The process flowsheets utilized by both CGP1 and CGP2 are similar and include the following major unit operations to produce chemical grade spodumene concentrates:

- Crushing
- Grinding and classification
- Heavy media separation
- WHIMS
- Coarse mineral flotation
- Regrinding
- Regrind coarse mineral flotation
- Fine mineral flotation
- Concentrate filtration
- Final tailings thickening and storage at the tailing storage facility (TSF)

Ore tonnes processed in CGP1 during the period 2016 to 2021 (Jan to Sep) ranged from 1.18 Mt to 1.82 Mt with ore grades ranging from 2.49 to 2.70% Li_2O. During 2020, 1.40 Mt of ore were processed at an average grade of 2.51% Li_2O with 74.9% of the contained lithium being recovered into concentrates averaging 6.06% Li_2O, representing a mass yield of 31.1%. During 2021 (Jan to Sep), 1.36 Mt of ore were processed at an average grade of 2.57% Li_2O. Lithium recovery averaged 75.2% into concentrates that averaged 6.07% Li_2O representing a mass yield of 32%. Generally, Greenbushes' CGP1 yield model provides a good prediction of plant performance.

CGP2 commissioning began during September 2019 and continued through April 2020 and was then shut down and put on care and maintenance during the period of March 2020 to April 2021 due to market demand considerations. CGP2 was then put back into production during May 2021. During the 2020 plant commissioning period from January to April CGP2 processed 280,108 t of ore at an average grade of 2.19% Li_2O and recovered 52.9% of the lithium into 53,089 t of concentrate at an average grade of 6.10% Li_2O and 0.93% Fe_2O_3. Concentrate yield for this period averaged 18.9%. Although product quality specifications were achieved, lithium recovery and concentrate yield were substantially below target. During 2021 (May-September), CGP2 processed 847,058 t of ore at an average grade of 2% Li_2O and recovered 51% of the lithium (versus a predicted recovery of 75%) into 145,230 t of concentrate at an average grade of 5.94% Li_2O and 1.01% Fe_2O_3. Concentrate yield for this period averaged 17.2% versus the model yield projection of 25%. Although product quality specifications were generally achieved, lithium recovery and concentrate yield have continued to be substantially below target.

Greenbushes has continued to investigate CGP2 plant performance, and their metallurgical department issued a summary report during October 2021 which addressed efforts to identify the key problem areas in the plant. In addition, Greenbushes metallurgical staff have developed a new yield equation for CGP2 based on actual performance during the period 2019 to 2021. For purposes of financial modeling SRK has assumed that this updated yield equation will represent CGP2 production during the period of 2023 to 2024 while Greenbushes works to resolve process issues related to CGP2. SRK assumes that these process issues will be resolved by Q1 2025 and from that point on CGP2 yield will be represented by the yield equation that has been established for CGP1. SRK notes that CGP2 and CGP1 flowsheets are similar and both plants process ore from the same mining operation, as such, SRK believes that it is reasonable to expect that CGP2 will eventually achieve design product targets but cautions that at this point design performance of CGP2 remains to be demonstrated and has not yet been confirmed.

In order to further assess CGP2 performance issues, Greenbushes retained MinSol Engineering Pty Ltd (MinSol) to undertake a performance assessment of CGP2 in November 2021 to provide a baseline for the current plant operating conditions versus design and to provide recommendations to optimize CGP2 performance with respect to concentrate grade and recovery. Based in this initial review, MinSol identified the following priority areas as a path forward to address CGP2 process performance:

- Undertake a comprehensive plant audit to better quantify the source and magnitude of recovery and losses.
- Engage instrument suppliers to rectify calibration and accuracy issues to enable plant balance and troubleshooting.
- Reduce the panel apertures on the secondary screen to allow subsequent reduction in primary stacksizer screen aperture to 600um per design.
- Modify the classifier split points per design to reduce load on fines WHIMS, increase feed to coarse flotation and reduce the particle top size into the fines float.
- Undertake a detailed test program to assess the cause for high lithium losses during flotation
- Return the coarse thickener underflow back onto the process (currently a product stream that is directed to tailings).

1.8 Infrastructure

Greenbushes is a mature operating lithium hard rock open pit mining and concentration project that produces lithium carbonate. Access to the site is by paved highway off a major Western Australian highway. Employees travel to the project from various communities in the region. The established facilities on the site include security fencing and guard house access, communications systems, access roads and interior site roads, administrative and other offices, change houses, existing mine services area (MSA), warehousing, shops, crushing plants, processing plants (CGP1/CGP2/TGP), tailings facilities, explosives storage facilities, water supply and distribution system with associated storage dams, power supply and distribution system, laboratory, fuel storage and delivery system, reverse-osmosis water treatment plant, health-safety-training offices, mine rescue area, storage sheds, mine waste storage area, miscellaneous waste storage facilities, and engineering offices. The concentrate is shipped by truck to port facilities located at Bunbury 90 km to the west of the Project. These facilities are in place and functional. An abandoned rail line is present north of the project but not currently used.

Several changes or modifications to the infrastructure are planned/or currently in progress. An upgraded 132 kV power line will be placed in service by 2023. A new Mine Service Area (MSA) will be constructed and operating by Q1 2023 to provide mine heavy and light equipment maintenance facilities and technical services offices as the existing MSA will be impacted by the planned pit progression. A mine access road will be added to reduce truck traffic through Greenbushes. The current explosives handling facilities are being impacted by near-term pit expansion and new facilities are being completed to the west of the processing plant areas where they will not require to be moved again. The warehouse and laboratories are planned to be expanded. The tailings facilities will be expanded with the addition of a new two cell facility known as TSF4 located adjacent to and south of the existing TSF2 and TSF1 facilities. TSF1 will be expanded late in the mine life to meet tailings storage needs. The waste rock facilities will continue to expand on the west side of the pit toward the highway and south toward the permit boundary adjacent to TSF4.

1.9 Environmental Studies, Permitting, and Plans, Negotiations, or Agreements with Local Individuals or Groups

The Project has been in operation as a hard rock mine since 1983 and is fully permitted for its current operations. The Project is in the process of obtaining further approvals for expansion; however, consideration of the expansion has been excluded from this evaluation as detailed assessment information is not yet available. Talison holds the mining rights to lithium at the Project and Global Advanced Metals (GAM) holds the rights to non-lithium minerals. GAM processes tantalum and tin extracted by Talison during mining activities within the Project area under their own operating license and GAM are, therefore, responsible for the environmental management of their premises. Under agreement, Talison provides services to GAM consisting of laboratory analysis and environmental reporting and shared use of some water circuit infrastructure.

Environmental Study Results

The Project is in the southwest of Western Australia in the Shire of Bridgetown-Greenbushes. The town of Greenbushes is located on the northern boundary of the mine. The majority of the Project is within the Greenbushes Class A State Forest (State Forest 20) which covers 6,088 ha and is managed by the Department of Biodiversity, Conservation and Attractions (DBCA) as public reserve land under the Conservation and Land Management Act 1984 (CALM Act). The DBCA manages State Forest 20 in accordance with the Forest Management Plan 2014-2023, that aims to maintain the overall area of native forest and plantation available for forest produce, including biodiversity and ecological integrity. The remaining land in the Project area is privately owned. During development and subsequent modifications to the mine, environmental studies and impact assessments have been completed to support project approval applications, including studies related to:

- Flora and vegetation
- Terrestrial and aquatic fauna
- Surface and groundwater
- Material characterization (geochemistry)
- Air quality and greenhouse gas assessment
- Noise, vibration and visual amenity
- Cultural Heritage

Environmental Management and Monitoring

The Project operates under approvals that contain conditions for environmental management that include waste and tailings disposal, site monitoring, and water management. Primary approvals are authorized under the federal Environment Protection and Biodiversity and Conservation Act 1999 (EPBC Act), the Environmental Protection Act 1986 (EP Act) including the environmental impact assessment approval for the proposed mine expansion (Ministerial Statement 1111), the operation of a prescribed premises (License L4247/1991/13), approval for the construction and commissioning of a prescribed premises for the proposed mine expansion (W6283/2019/1), and under the Mining Act 1978 under an approved Mine Closure Plan (Reg ID 60857) and several Mining Proposals (section 17.3) conditions.

Specific requirement for compliance and ambient monitoring are defined in the License (L4247/1991/13) and Works Approval (W6283/2019/1). The monitoring results must be reported to the regulators (DWER and DMIRS) on an annual basis and include point source emissions to surface water including discharge and seepage locations, process water monitoring, permitted emission points for waste discharge to surface water, ambient surface water quality and ambient groundwater quality monitoring, ambient surface water flow and each spring, complete an ecological assessment of four sites upstream and six sites downstream of the Norilup Dam.

Project Permitting Requirements

Australia has a robust and well-developed legislative framework for the management of the environmental impacts from mining activities. Primary environmental approvals are governed by the federal EPBC Act and the environmental impact assessment process in Western Australia is administered under Part IV of the Environmental Protection Act 1986 (EP Act). Additional approvals in Western Australia are principally governed by Part V of the EP Act and by the Mining Act 1978 (Mining Act) as well as several other regulatory instruments. Primary and other key approvals are discussed in Section 17.

Environmental Compliance

The Project has not incurred any significant environmental incidents (EPA, 2020). Reportable incidents in the 2018-2019 AER period totaled 85 incidents and consist primarily of spills (44), followed by water or tailings incidents (18), flora and fauna incidents (16) and dust incidents (11). Complaints comprised four complaints for noise and blasting, one dust complaint, one light complaint, and one odor complaint.

The Project is responsible for contamination of five sites due to hydrocarbons and metals in soil, and elevated concentrations of metals in groundwater and surface water (Site IDs 34013, 73571, 73572, 75019, and 75017). These sites are classified as “Contaminated – Restricted use” and only permit commercial and industrial uses. This will need to be reviewed for final land use options for closure.

Local Individuals and Groups

The mining tenure for the Project was granted in 1984 and, therefore, is not a future act as defined under the Native Title Act 1993 (a 'future act' is an act done after the January 1, 1994, which affects Native Title). The Project is, therefore, not required to have obtained agreements with the local native title claimant groups.

The Project lies immediately south of the town of Greenbushes and maintains an active stakeholder engagement program and information sessions to groups such as the “Grow Greenbushes.” Senior mine management resides in the town. Talison promotes local education (the Greenbushes Primary School and tertiary sponsorships) and provides support community groups with money and services (allocated in the Environmental and Community budget).

Talison has two agreements in place with local groups:

- Blackwood Basin Group (BBG) Incorporated – offset management agreement whereby BBG have agreed to manage and improve the condition of native vegetation for the purpose of the Black Cockatoo offset requirements.
- Tonebridge Grazing Pty Ltd. – site conservation agreement for the protection and improvement of native vegetation to protect Black Cockatoo habitat.

Mine Closure

Talison has a mine closure plan submitted and approved by DMIRS on 23 February 2017, with their costs updated in October 2016.

Western Australia does not require a company to post performance or reclamation bonds. All tenement holders in Western Australia are required to annually report disturbance and to make contributions to a pooled fund based on the type and extent of disturbance under the Mining Rehabilitation Fund Act 2012 (MRF Act). The pooled fund can be used by the Department of Mines, Industry Regulation and Safety (DMIRS) to rehabilitate mines where the tenement holder/operator has failed to meet their rehabilitation obligations and finances have not been able to be recovered. The interest earned on the pooled fund is used for administration and to rehabilitate legacy abandoned mine sites.

A cost estimate for immediate (unplanned) closure of Greenbushes has been prepared by Talison using the Victorian Government Rehabilitation bond calculator (dpi-bond-calculator-24-feb-2011) as a template to assist them in identifying and costing the rehabilitation, decommissioning and monitoring requirements for the Greenbushes site. The Victorian Government bond calculator uses predefined third-party unit rates based on the typical current market ‘third party rates’ as of July 2010, which may overestimate or underestimate closure costs for Western Australia. Talison has been escalating these unit rates since 2013.

The latest version of closure cost estimate available for review was the 2019 draft estimate. It only includes the facilities that were on site at that time and does not include any future expansions. Changes to the site during 2020 and any future plans are not included. This closure cost estimate totals AU$37,232,334 for Talison's portion of the operation. GAM is responsible for closure for the remainder of the site,

The Victorian Government model used by Talison to estimate closure costs was designed in 2011 using 2010 rates. It does not use site specific rates as is good industry practice. There is no documentation on the basis of the unit rates used in the Victorian model and the government of Victoria was unable to provide any information regarding the accuracy of the rates. Because of this, SRK cannot validate any of the unit rates used in the model or the overall cost estimate.

Furthermore, because closure of the site is not expected until 2056, the closure cost estimate represents future costs based on current site conditions. In all probability, site conditions at closure will be different than currently expected and, therefore, the current estimate of closure costs is unlikely to reflect the actual closure cost that will be incurred in the future.

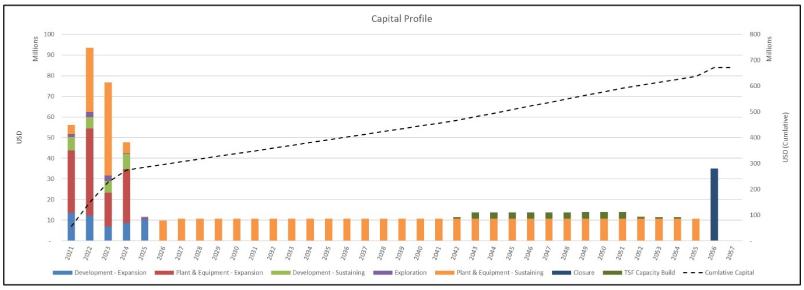
Currently, the site must treat mine water collecting in the Southampton and Cowan Brook Dams prior to discharge due to elevated levels of arsenic and lithium in the water. The sources of elevated lithium and arsenic in the mine water circuit include dewatering water from the pit. However, there has been no study to determine if water that will eventually collect in the pit or from any other point source and discharge will meet discharge water quality standards. Therefore, no assessment of the probability that post-closure water management or water treatment has been performed.

Additionally, contaminated seepage from TSF2 has recently been observed in the alluvial aquifer and is now being collected via French drains constructed along the toe of the embankment and conveyed to the water treatment plant. At this time, no studies have been conducted to determine the cause of the current seepage, the likelihood and duration of continued seepage, or the possibility that additional seepage could occur from the other TSF facilities.

If perpetual, or even long-term, treatment of water is required to comply with discharge requirements, the closure cost estimate provided by Talison could be materially deficient.

1.10 Summary Capital and Operating Cost Estimates

Capital cost forecasts were developed in Australian dollars. The cost associated with the sustaining capital at the operation are presented in Figure 1-2. The total sustaining capital spend over life of mine is forecast at US$374M.



Source: SRK

Figure 1-2: Sustaining Capital Profile

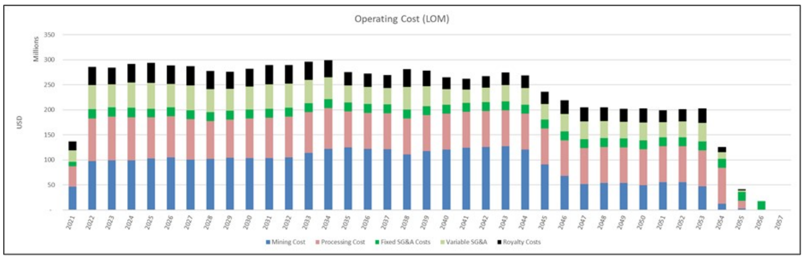
Operating costs were forecast in Australian dollars and are categorized as mining, processing and SG&A costs. Mining costs include the costs to move the ore and waste material to waste dumps, stockpiles or plant feed locations. Processing costs include the costs to process the ore into a concentrate. SG&A costs include the general and administrative costs of running the operation and the selling expenses associated with the concentrate product. A summary of the life of mine average for mining, processing and SG&A costs is presented in Table 1-3.

Table 1-3: Life of Mine Operating Cost Averages

Category	Unit	Value
Mining Cost	US$/t mined	5.30
Processing Cost	US$/t processed	17.86
SG&A Cost	US$/t concentrate	59.71

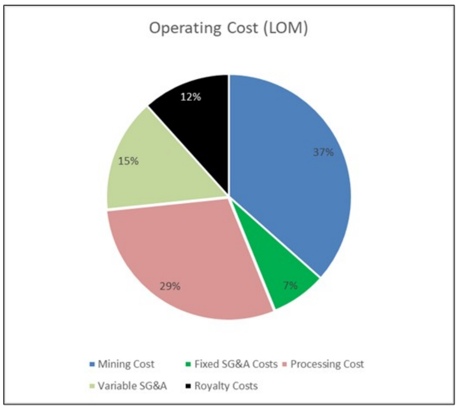
Source: SRK, 2020

These costs are typically broken out into fixed and variable costs. A life of mine summary of the operating cost breakdown is presented in Figure 1-3 and Figure 1-4.



Source: SRK, 2020

Figure 1-3: Life of Mine Operating Cost Profile



Source: SRK

Figure 1-4: Life of Mine Operating Cost Summary

1.11 Economics

Economic analysis, including estimation of capital and operating costs is inherently a forward-looking exercise. These estimates rely upon a range of assumptions and forecasts that are subject to change depending upon macroeconomic conditions, operating strategy and new data collected through future operations and therefore actual economic outcomes often deviate significantly from forecasts.

The Greenbushes operation consists of an open pit mine and several processing facilities fed primarily by the open pit mine. The operation is expected to have a 35 year life with the first modeled year of operation being a partial year to align with the effective date of the reserves.

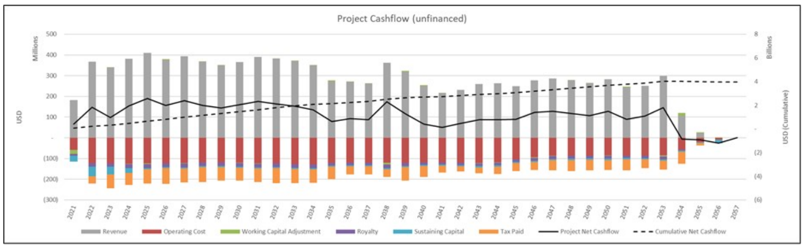
The economic analysis metrics are prepared on annual after tax basis in US$. The results of the analysis are presented in Table 1-4. The results indicate that, at a CIF China chemical grade concentrate price of US$650/t, the operation returns an after-tax NPV@8% of US$3.2B (US$1.6B attributable to Albemarle). Note, that because the mine is in operation and is valued on a total project basis with prior costs treated as sunk, IRR and payback period analysis are not relevant metrics.

Table 1-4: Indicative Economic Results (Albemarle)

LoM Cash Flow (Unfinanced)	Units	Value
Total Revenue	US$M	10,287
Total Opex	US$M	(3,744)
Operating Margin	US$M	6,542
Operating Margin Ratio	%	64%
Taxes Paid	US$M	(1,743)
Free Cashflow	US$M	3,977
Before Tax		
Free Cash Flow	US$M	5,720
NPV @ 8%	US$M	2,198
After Tax		
Free Cash Flow	US$M	3,977
NPV @ 8%	US$M	1,562

Source: SRK

A summary of the cashflow on an annual basis is presented in Figure 1-5.



Source: SRK

Figure 1-5: Annual Cashflow Summary

1.12 Conclusions and Recommendations

1.12.1 Property Description and Ownership

The property is well known in terms of descriptive factors and ownership, and there are no additional recommendations at this time.

1.12.2 Geology and Mineralization

Geology and mineralization are well understood through decades of active mining, and there are no additional recommendations at this time.

1.12.3 Status of Exploration, Development and Operations

The status of exploration, development, and operations is very advanced and active. Assuming that exploration and mining continue at Greenbushes in the way that they are currently being done, there are no additional recommendations at this time.

1.12.4 Mineral Resource

SRK has reported a mineral resource estimation which is appropriate for public disclosure and long term considerations of mining viability. The mineral resource estimation could be improved with additional confidence in development of a detailed structural model to support geotechnical or localized oxidation effects on the deposit, but SRK notes that brittle structure is not critical to reporting of global resources for Greenbushes. In addition, SRK recommends integrating more detailed geological data (such as blast holes and additional pit mapping) into the process, perhaps just supporting smaller scale detailed geological models for short-range planning. This is already active at the operating mine but could potentially be integrated back into the long term resource work to enhance confidence in certain areas.

1.12.5 Reserves and Mining Methods

SRK has reported mineral reserves that are appropriate for public disclosure. The mine plan, which is based on the mineral reserves, spans approximately 32 years (or approximately 38 years when including the processing of low-grade stockpiles at the end of the mine life). Annual material movement requirements are reasonable, with a peak annual material movement of approximately 24 Mt. Over the life of the project, approximately 458 Mt of waste will be mined from the open pit. A feasible waste dump design exists to accommodate the LoM waste quantity; however, a portion of the footprint of the designed waste dump extends over the highly prospective Kapanga lithium deposit. SRK recommends that Greenbushes review its waste dump design to determine whether it will be possible to move the waste dump design to a location other than the area over the Kapanga deposit. The reserves processed at CGP2 assumes that the current ramp up issues with lower recovery will be solved by applying additional capital to the plant. If expected recoveries are not realized, less concentrate will be produced.

1.12.6 Processing and Recovery Methods

A comparison of the CGP1 yield model with actual CGP1 plant performance shows that the CGP1 yield model is generally a good predictor of CGP1 plant performance. However, a comparison of the CGP2 yield model with actual CGP2 plant performance during commissioning shows that CGP2 has significantly underperformed the CGP2 yield model.

During 2021 (May-September), CGP2 processed 847,058 t of ore at an average grade of 2.00% Li_2O and recovered 51.0% of the lithium (versus a predicted recovery of 75.0%) into 145,230 t of concentrate at an average grade of 5.94% Li_2O and 1.01% Fe_2O_3. Concentrate yield for this period averaged 17.2% versus the model yield projection of 25.0%. Although, product quality specifications were generally achieved, lithium recovery and concentrate yield have continued to be substantially below target.

Greenbushes metallurgical staff have developed a new yield equation for CGP2 based on actual performance during the period 2019 to 2021. For purposes of financial modeling SRK has assumed that this updated yield equation will represent CGP2 production during the period 2023 to 2024 while Greenbushes works to resolve process issues related to CGP2. SRK assumes that these process issues will be resolved by Q1 2025 and from that point on CGP2 yield will be represented by the yield equation that has been established for CGP1. SRK notes that that CGP2 and CGP1 flowsheets for are similar and both plants process ore from the same mining operation, as such, SRK believes that it is reasonable to expect that CGP2 will eventually achieve design product targets but cautions that at this point design performance of CGP2 remains to be demonstrated and has not yet been confirmed.

Greenbushes has retained MinSol to undertake a performance assessment of CGP2 in November 2021 to provide a baseline for the current plant operating conditions versus design and to provide recommendations to optimize CGP2 performance with respect to concentrate grade and recovery

1.12.7 Infrastructure

The infrastructure at Greenbushes is installed and functional. Expansion projects have been identified and are at the appropriate level of design depending on their expected timing of the future expansion. Tailings and waste rock are flagged as risks due to the potential for future expansion and location of future resources that are in development. SRK recommends a detailed review of long term storage options for both tailings and waste rock will allow timely planning and identification of alternative storage options for future accelerated expansion if needed.

1.12.8 Environmental Studies, Permitting, and Plans, Negotiations, or Agreements with Local Individuals or Groups

The Project has been in operation as a hard rock mine since 1983 and is fully permitted for its current operations. The Project is in the process of obtaining further approvals for expansion; however, consideration of the expansion has been excluded from this evaluation as detailed assessment information is not yet available.

During development and subsequent modifications to the mine, environmental studies and impact assessments have been completed to support project approval applications. Many of these studies are currently being updated as part of the current expansion efforts; as such, the most up-to-date information was not readily available. Some of the key findings from previous studies include:

- No Threatened Ecological Communities, Priority Ecological Communities or threatened flora have been reported in the vicinity of the mine site.
- There have been seven conservation significant fauna species recorded in the mine development area.
- Surface water drains through tributaries of the Blackwood River which is registered as a significant Aboriginal site that must be protected under the Aboriginal Heritage Act 1972.
- Groundwater is not a resource in the local area due to the low permeability of the basement rock.
- Earlier studies indicated that the pits would overflow approximately 300 years after mine closure; however, more recent modelling suggests that water levels will stabilize in approximately 500 to 900 years and remain 20 m below the pit rims (i.e., no overflow).
- Background groundwater quality data are limited due to a lack of monitoring wells upgradient of the mine, and as monitoring wells are located close to the TSFs and/or in the historically dredged channels; some of these wells have been impacted by seepage and are under investigation and remediation efforts.
- Waste rock is not typically acid generating, though some potentially acid generating (PAG) granofels (metasediments) do occur in the footwall of the orebody. Significant acid neutralizing capacity (ANC) has been shown to exist in waste rock and pit walls.
- Studies into the potential for radionuclides has consistently returned results that are below trigger values.

- There are no other cultural sites listed within the mining development area.

The Project operates under approvals that contain conditions for environmental management that include waste and tailings disposal, site monitoring, and water management. The Project has not incurred any significant environmental incidents (EPA, 2021).

There has been no predictive modeling of the pit lake quality as far as SRK is aware, and this is recommended to inform closure management strategies. There is potential for site water management to be required post-closure until seepage from TSF2 attenuates.

The Project has contaminated five sites listed which encompass the entire mine area due to known or suspected contaminated site due to hydrocarbons and metals in soil, and elevated concentrations of metals in groundwater and surface water. These sites are classified as “Contaminated – Restricted use” and only permit commercial and industrial uses. This will need to be reviewed for final land use options for closure.

Talison has agreements in place with two local groups.

Although Greenbushes has a closure plan prepared in accordance with applicable regulations, this plan should be updated to include all closure activities necessary to properly closure all of the project facilities that are part of the current mine plan including future expansions and facilities. This update should be prepared in accordance with applicable regulatory requirements and commitments included in the approved closure plan. It should also be prepared in sufficient detail that a proper PFS-level closure cost estimate can be prepared.

1.12.9 Summary Capital and Operating Cost Estimates

Greenbushes cost forecasts are based on mature mine budgets that have historical accounting data to support the cost basis and forward looking mine plans as a basis for future operating costs as well as forward looking capital estimates based on engineered estimates for expansion capital and historically driven sustaining capital costs. Forecast costs assumes a constant exchange rate which benefits the current cost structure. In SRK’s opinion, the estimates are reasonable in the context of the current reserve and mine plan.

1.12.10 Economics

The operation is forecast to generate positive cashflow over the life of the reserves, based on the assumptions detailed in this report. This estimated cashflow is inherently forward-looking and dependent upon numerous assumptions and forecasts, such as macroeconomic conditions, mine plans and operating strategy, that are subject to change.

As modeled for this analysis, the operation is forecast to produce 32.3Mt of spodumene concentrate to be sold at a CIF price of US$650/t. This yields an after-tax project NPV@ 8% of US$3.2B, of which, US$1.6B is attributable to Albemarle.

The analysis performed for this report indicates that the operation’s NPV is most sensitive to variations in the grade of ore mined, the commodity price received and plant performance.

2 Introduction

This Technical Report Summary was prepared in accordance with the Securities and Exchange Commission (SEC) S-K regulations (Title 17, Part 229, Items 601 and 1300 through 1305) for Albemarle Corporation (Albemarle) by SRK Consulting (U.S.), Inc. (SRK) on the Greenbushes Mine (Greenbushes). Greenbushes is held within the operating entity, Talison Lithium Australia Pty Ltd (Talison), of which Albemarle is a 49% owner with the remaining 51% ownership controlled by Tianqi/IGO JV.

2.1 Terms of Reference and Purpose of the Report

The quality of information, conclusions, and estimates contained herein are consistent with the level of effort involved in SRK's services, based on: i) information available at the time of preparation and ii) the assumptions, conditions, and qualifications set forth in this report. This report is intended for use by Albemarle subject to the terms and conditions of its contract with SRK and relevant securities legislation. The contract permits Albemarle to file this report as a Technical Report Summary with American securities regulatory authorities pursuant to the SEC S-K regulations, more specifically Title 17, Subpart 229.600, item 601(b)(96) - Technical Report Summary and Title 17, Subpart 229.1300 - Disclosure by Registrants Engaged in Mining Operations. Any other uses of this report by any third party are at that party's sole risk. The responsibility for this disclosure remains with Albemarle.

The Greenbushes facilities produce a range of spodumene concentrate products that are sold into technical and chemical lithium markets. However, for the purposes of developing the reserve estimate herein, SRK has based its economic analysis on the sale of only chemical grade spodumene concentrate. This is because Talison's ability to predict lithium production for technical grade product at a level that meets the standard of uncertainty for a reserve requires grade control drilling. Therefore, instead of assuming sale of technical grade concentrates, SRK has assumed that all product is sold into chemical markets. In SRK's opinion, from a geological standpoint this is a reasonable assumption as any material that is appropriate to feed technical grade production can also be used for chemical grade feed. Further, again in SRK's opinion, it is reasonable (and somewhat conservative) from an economic standpoint as the weighted average price Talison has historically received for technical grade concentrates is higher than the average price for chemical grade concentrate (i.e. assuming receipt of chemical grade revenue likely understates the value of production that would typically go to technical grade markets).

Greenbushes has developed and installed a Tailings Reprocessing Plant (TRP) to reprocess tailings from Tailings Storage Area 1 (TSF1). In SRK's opinion, due to the high level of inherent variability in mineral contained in a tailings storage facility, establishing geological, processing and production data to adequately meet the standard of uncertainty required to support an estimate of reserves is difficult. Further, the quantify of potential production from TSF1 is minimal in the context of the overall Greenbushes reserve. Therefore, the potential spodumene concentrate production from the reprocessing effort has not been included in the reserve estimate.

Greenbushes has developed cost estimates and designs for the expansion of chemical grade spodumene production capacity. These expansion plans are in the form of chemical grade plants three and four (CGP3 and CGP4). Although the engineering work has progressed significantly, there is substantial uncertainty at the time of writing this report on the timing and whether the facilities will be placed in service. Therefore, SRK has not included the development of CGP3 and CGP4 in its analysis to support the reserve estimate and has limited the reserves estimate to production from the constructed facilities (CGP1, CGP2, and the equivalent Technical Grade Plant (TGP) production of chemical grade product). SRK's exclusion of CGP3 and CGP4 does not reflect any opinion on the technical or economic viability of these facilities but is simply due to uncertainty around their timing and development.

Further discussion and reference information for completeness on the TGP, TRP and CGP3/CGP4 is provided in Chapter 21.

The purpose of this Technical Report Summary is to report mineral resources and mineral reserves.

The effective date of this report is June 30, 2021.

2.2 Sources of Information

This report is based in part on internal Company technical reports, previous feasibility studies, maps, published government reports, Company letters and memoranda, and public information as cited throughout this report and listed in the References Section 24.

Reliance upon information provided by the registrant is listed in the Section 25 when applicable.

2.3 Details of Inspection

Table 2-1 summarizes the details of the personal inspections on the property by each qualified person or, if applicable, the reason why a personal inspection has not been completed.

Table 2-1: Site Visits

Expertise	Date(s) of Visit	Details of Inspection	Reason Why a Personal Inspection Has Not Been Completed
Environmental/ Closure	August 19-20, 2020	Day 1: Site overview presentation with Craig Dawson (General Manager – Operations) and meeting with Site Environmental Team. Proceeded to Cornwall Pit, which is currently used for water capture, followed on to C1/C2/C3 Open pit lookout, inspection of the progressive rehabilitation at Floyds WRL, Tailings retreatment plant and finished with a tour of the technical and chemical grade processing plants. Day 2: Inspection of the rehabilitation at TSF3, then to the seepage collection point just below Tin Shed Dam. Inspection of the buttress at TSF 2 and corresponding rehab of buttress, together with the new under drainage on the west side of TSF 2 to capture seepage. Visited Cowen Brook Dam. Overview of the WTP to be commissioned in September 2020 and visit o the storage dams Clearwater, Austins and Southhampton. Finished the tour with a visit to the 3 year old rehab to the west of Maranup Ford Road.	
Other Areas			Site Visit not completed due to Covid-19 travel restrictions

2.4 Report Version Update

The user of this document should ensure that this is the most recent Technical Report Summary for the property.

This Technical Report Summary is not an update of a previously filed Technical Report Summary.

2.5 Qualified Person

This report was prepared by SRK Consulting (U.S.), Inc., a third-party firm comprising mining experts in accordance with § 229.1302(b)(1). Albemarle has determined that SRK meets the qualifications specified under the definition of qualified person in § 229.1300. References to the Qualified Person or QP in this report are references to SRK Consulting (U.S.), Inc. and not to any individual employed at SRK.

3 Property Description

The Greenbushes property is a large mining operation located in Western Australia extracting lithium and tantalum products from a pegmatite orebody. Historically, the operation also produced tin. Active mining of tin began in 1888, with tantalum production commencing in 1942, and lithium production beginning in 1983. In addition to being the longest continuously operated mine in Western Australia, the Greenbushes pegmatite is one of the largest known spodumene pegmatite resources in the world.

3.1 Property Location

Greenbushes is located directly south of and immediately adjacent to the town of Greenbushes approximately 250 kilometers (km) south of Perth, at latitude 33° 52´S and longitude 116° 04´ E, and 90 km south-east of the Port of Bunbury, a major bulk handling port in the southwest of Western Australia (WA). It is situated approximately 300 meters (m) above mean sea level (AMSL).

Source: Talison, 2018

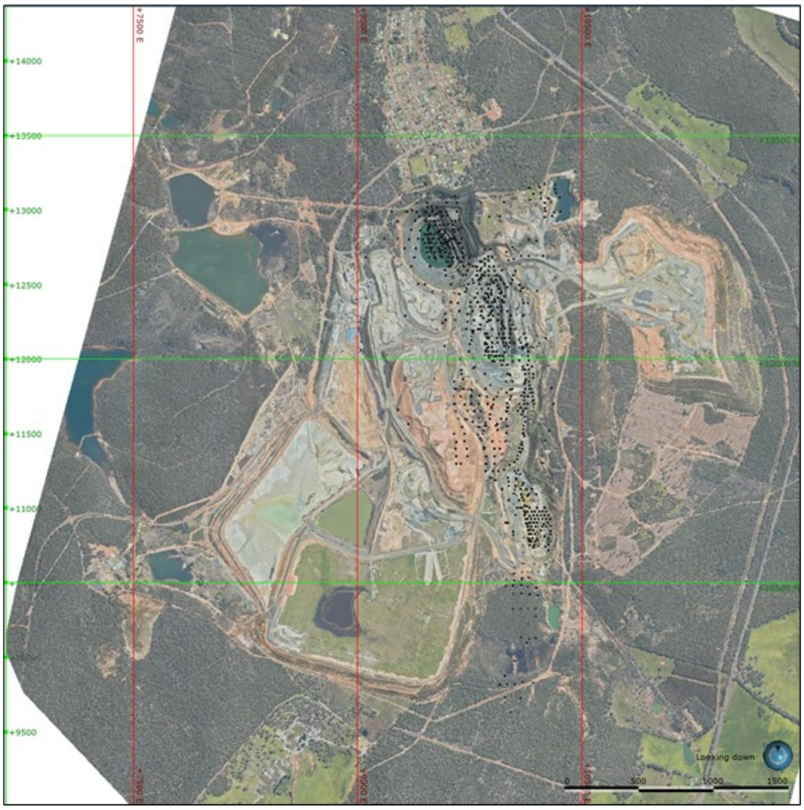
Figure 3-1: General Location Map, Greenbushes Mine

Source: Talison, 2018

Figure 3-2: Greenbushes Regional Location Map

3.2 Property Area

The Greenbushes property area is approximately 2,000 ha, which is a smaller subset of a larger 10,067 ha land package controlled by Talison. A general layout of the operating property utilizing a 2017 aerial photo is shown in Figure 3-3, along with drilling collars used for exploration of the primary pegmatite bodies discussed herein. Mineralized pegmatites occur over the property area, generally trending north – south.



Source: SRK, 2018

Figure 3-3: Property Area

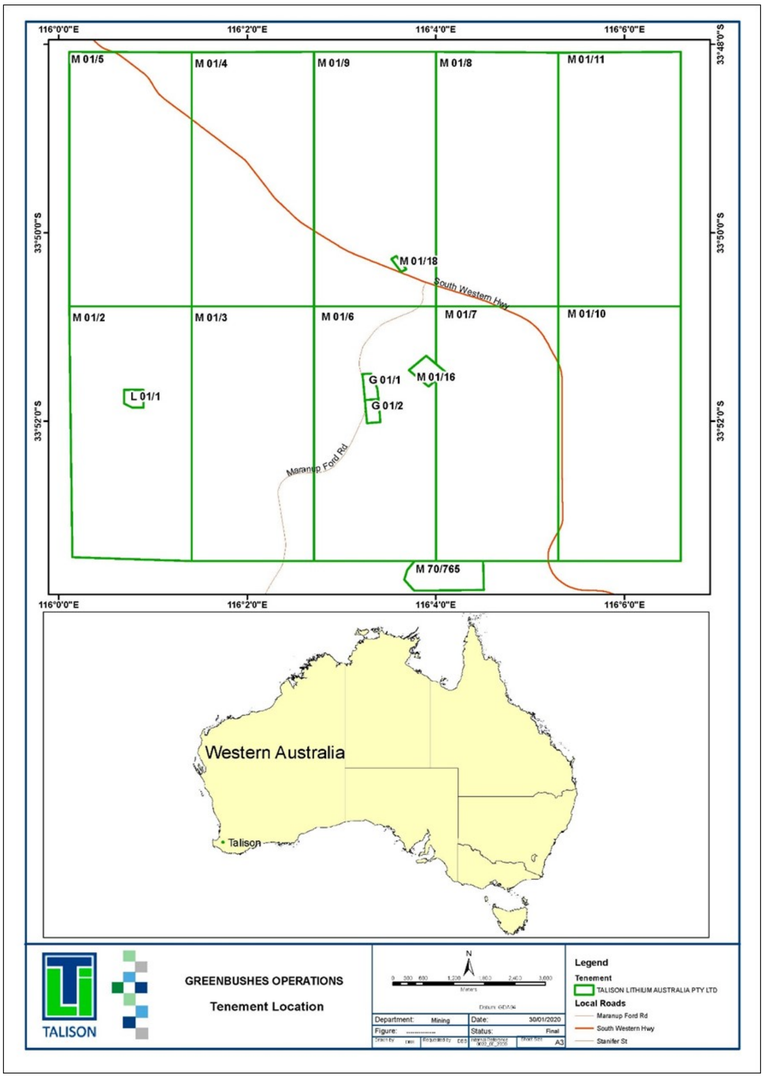
3.3 Mineral Title

Talison holds 10,067 Ha of mineral tenements which cover the Greenbushes area and surrounding exploration areas. As noted in Table 3-1, some types of title are noted as general purpose leases, while others are discrete mining leases. Active mining and exploration is completely contained within mining leases or other licenses as appropriate. SRK notes that the entirety of the mineral resources and mineral reserves disclosed herein are contained within titles 100% controlled by Talison and summarized in Table 3-1. The layout of the relevant property boundaries is shown in Figure 3-4.

Table 3-1: Land Tenure Table

Claim ID	Owner(s)	As Reported Type	Status	Date Granted	Expiry Date	Source As Of Date	Area (Ha)
G 01/1	Talison Lithium Australia Pty Ltd	General Purpose Lease	Active/ Granted	11/14/1986	6/5/2028	11/30/2020	10
G 01/2	Talison Lithium Australia Pty Ltd	General Purpose Lease	Active/ Granted	11/14/1986	6/5/2028	11/30/2020	10
L 01/1	Talison Lithium Australia Pty Ltd	Miscellaneous License	Active/ Granted	3/19/1986	12/27/2026	11/30/2020	9
M 01/6	Talison Lithium Australia Pty Ltd	Mining Lease	Active/ Granted	12/28/1984	12/27/2026	11/30/2020	985
M 01/5	Talison Lithium Australia Pty Ltd	Mining Lease	Active/ Granted	12/28/1984	12/27/2026	11/30/2020	999
M 70/765	Talison Lithium Australia Pty Ltd	Mining Lease	Active/ Granted	6/15/1994	6/19/2036	11/30/2020	71
M 01/3	Talison Lithium Australia Pty Ltd	Mining Lease	Active/ Granted	12/28/1984	12/27/2026	11/30/2020	1,000
M 01/7	Talison Lithium Australia Pty Ltd	Mining Lease	Active/ Granted	12/28/1984	12/27/2026	11/30/2020	998
M 01/4	Talison Lithium Australia Pty Ltd	Mining Lease	Active/ Granted	12/28/1984	12/27/2026	11/30/2020	999
M 01/8	Talison Lithium Australia Pty Ltd	Mining Lease	Active/ Granted	12/28/1984	12/27/2026	11/30/2020	999
M 01/10	Talison Lithium Australia Pty Ltd	Mining Lease	Active/ Granted	12/28/1984	12/27/2026	11/30/2020	1,000
M 01/11	Talison Lithium Australia Pty Ltd	Mining Lease	Active/ Granted	12/28/1984	12/27/2026	11/30/2020	999
M 01/16	Talison Lithium Australia Pty Ltd	Mining Lease	Active/ Granted	6/3/1986	6/5/2028	11/30/2020	19
M 01/9	Talison Lithium Australia Pty Ltd	Mining Lease	Active/ Granted	12/28/1984	12/27/2026	11/30/2020	997
M 01/18	Talison Lithium Australia Pty Ltd	Mining Lease	Active/ Granted	9/16/1994	9/27/2036	11/30/2020	3
M 01/2	Talison Lithium Australia Pty Ltd	Mining Lease	Active/ Granted	12/28/1984	12/27/2026	11/30/2020	969

Source: Department of Mines and Petroleum (W. Australia), 2020



Source: Talison, 2020
Note: Generalized Greenbushes operations area shown in red box.

Figure 3-4: Greenbushes Land Tenure Map

Mining leases entitle the tenement holder to work and mine the land. The operating mine and processing plant area covers a total area of about 3,500 Ha and generally sits on mining leases M01/06, M01/07 and M01/16. Talison holds the mining rights for all lithium minerals on these tenements, while Global Advanced Metals (GAM) holds the mining rights to all minerals other than lithium through a reserved mineral rights agreement dated November 13, 2009. Currently, the only mineral extracted at Greenbushes is lithium although there are also facilities on site for processing tantalum that are on care and maintenance.

All tenements are registered with the mining registrars located in the State of WA. They have been surveyed and constituted under the Mining Act 1978 (WA) (BDA, 2012). Talison continues to review and renew all tenements on an annual basis and ensures compliance with relevant regulatory requirements and fees for maintenance of these tenements.

3.4 Encumbrances

SRK is not aware of any material encumbrances that would impact the current resource or reserve disclosure as presented herein. Infrastructure movement or modifications which could be related to further expansion or development of the current mineral resource or mineral reserve are detailed in section 15 of this report.

3.5 Royalties or Similar Interest

In WA, a royalty of 5% of the royalty value of lithium concentrate sales is payable for lithium mineral production as prescribed under the Mining Act. 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 (BDA, 2012).

3.6 Other Significant Factors and Risks

SRK is not aware of any other significant factors or risk that may affect access, title, or the right or ability to perform work on the property.

4 Accessibility, Climate, Local Resources, Infrastructure and Physiography

4.1 Topography, Elevation and Vegetation

Excerpted from BDA, 2012.

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

4.2 Means of Access

Access to the property is via the paved major South Western Highway between Bunbury and Bridgetown to the Greenbushes Township, and via Maranup Ford Road to the mine. A major international airport is located in Perth, WA, approximately 250 km north of the mine area (BDA, 2012).

4.3 Climate and Length of Operating Season

Excerpted from BDA, 2012.

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

4.4 Infrastructure Availability and Sources

4.4.1 Water

Water is currently supplied from developed surface water impoundments for capture of precipitation runoff, pumping from sumps within the mining excavations and recycled from multiple TSFs. No mine water is sourced directly from groundwater aquifers through production or dewatering wells. The majority of these water sources and impoundments are linked through constructed surface pumps and conveyance.

4.4.2 Electricity

Power is provided by utility line power from existing Western Power transmission that runs along the east side of the deposit. 22kV transmission lines feed off the Western power transmission line from both the north and south to form a loop configuration. The 22 kV transmission then feeds local power distribution to the various loads on the project.

4.4.3 Personnel

The mine and processing facilities are located about 3 km south of the community of Greenbushes part of Bridgetown-Greenbushes Shire and the community of Greenbushes is the closest community to the site. Personnel working at the project typically live within a thirty-minute drive of the project. A number of local communities are within 30 minutes of the site. Skilled labor is available in the region and Talison has an established work force with skilled labor. The current labor levels are approximately 659 people.

4.4.4 Supplies

Supplies are readily available from established vendors and services from the local communities and from the regional capital Perth located 250 km to the north.

5 History

Mining in the Greenbushes area has continued almost uninterrupted since tin was first discovered at Greenbushes in 1886. Greenbushes is recognized as the longest continuously operated mine in WA (BDA, 2012).

5.1 Previous Operations

Excerpted from BDA, 2012.

5.1.1 Tin

Since it was first discovered at Greenbushes 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. However, there was a gradual decline in tin production between 1914 and 1930. Vultan Mines carried out sluicing operations of the weathered tin oxides between 1935 and 1943, while 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.

5.1.2 Tantalum

Tantalum mining at Greenbushes commenced in the 1940s with the advancement in electronics. Tantalum hard-rock operations started in 1992 with an ore processing capacity of 800,000 t/y. By the late 1990s demand for tantalum reached all-time highs and the existing high grade Cornwall Pit was nearing completion. In order to meet increasing demand a decision was made to expand the mill capacity to 4 Mt/y and develop an underground mine, to provide higher grade ore for blending with the lower grade ore from the Central Lode pits. An underground operation was commenced at the base of the Cornwall Pit in April 2001 to access high grade ore prior to the completion of the available open pit high-grade resource.

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. The lithium open pit operation has continued throughout recent times and mining is now focused on the Central Lode zone. Only lithium minerals are currently mined from the open pits. The tantalum mining operation and processing plants have been on care and maintenance since 2005.

5.1.3 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 commissioned at 30,000 t/y lithium mineral concentrator two years later in 1984 and 1985. The lithium assets were acquired by Lithium Australia Ltd in 1987 and Sons of Gwalia in 1989. Production capacity was increased to 100,000 t/y of lithium concentrate in the early 1990s and to 150,000 t/y of lithium concentrate by 1997, which included the capacity to produce a lithium concentrate for the lithium chemical converter market.

The Talison Minerals Group was incorporated in 2007 for the purpose of acquiring the assets of the Advanced Minerals Division of Sons of Gwalia by a consortium of US private equity companies led by Resource Capital Funds. The Talison Mineral Group's assets included the Wodgina tantalum mine located about 1,500 km north of Perth and 120 km south of Port Hedland in the Pilbara region of WA as well as the Greenbushes Lithium Operations. Upon completion of the reorganization of the Talison Minerals Group in 2010, Talison acquired the Greenbushes Lithium Operations, and the remainder of the assets were acquired by GAM.

There are two lithium processing plants that recover and upgrade the spodumene mineral using gravity, heavy media, flotation and magnetic processes into a range of products for bulk or bagged shipment. In the period of 2005 to 2008, demand from the Chinese chemical producers was satisfied by using the Greenbushes primary tantalum plant which had been on care and maintenance. Products from that plant had a lower grade than preferred by the Chinese customers and were supplied as a temporary measure until Talison's lithium concentrate production capacity was increased.

In 2009, Talison's processing plants were upgraded to total nominal capacity of approximately 260,000 t/y of lithium concentrates and in late 2010 capacity was increased to 700,000 t/y of ore feed yielding approximately 315,000 t/y of lithium concentrates.

5.2 Exploration and Development of Previous Owners or Operators

As noted above, the Greenbushes Mine is the longest continuously operating mine in WA and features an extensive exploration and operational history. Exploration work was conducted by previous owners and operators through the various commodities focuses as described in Section 5.1, including drilling (rotary, reverse circulation, and diamond core), surface sampling, geological mapping, trenching, geophysics.

Development work has generally included construction activities related to both open-pit and underground mining, as well as waste dumps, tailings facilities, surface water management infrastructure and more.

6 Geological Setting, Mineralization, and Deposit

6.1 Regional Geology

As stated by G. A. Partington (1990), the Greenbushes pegmatite in WA is intruded into rocks of the Balingup Metamorphic Belt (BMB), which is part of the Southwest Gneiss Terranes of the Yilgarn Craton. The Greenbushes pegmatite lies within, and is geometrically controlled by, the Donnybrook-Bridgetown Shear Zone. It appears to have been emplaced during the orogeny as is evidenced by the fine grain size and internal deformation. The pegmatites are believed to be Archaean in age and are dated at approximately 2,525 million years (Ma). Pegmatites are hosted by a 15 to 20 km wide, north to north-west trending sequence of sheared gneiss, orthogneiss, amphibolite and migmatite which outcrop along the trace of the lineament. A series of syn-tectonic granitoid intrusives occur within the BMB, elongated along the Donnybrook-Bridgetown Shear Zone. The pegmatites have been further affected by subsequent deformation and/or hydrothermal recrystallization, the last episode dated at around 1,100 Ma. Figure 6-1 shows the regional geology.

Source: Talison Lithium Limited

Figure 6-1: Regional Geology Map

6.2 Local Geology

The Greenbushes pegmatite deposit consists of a primary pegmatite intrusion with numerous smaller, generally linear pegmatite dikes and pods to the east. The primary intrusion and its subsidiary dikes and pods are concentrated within shear zones on the boundaries of granofels, ultramafic schists and amphibolites. The pegmatites are crosscut by ferrous-rich, mafic dolerite which is of paramount importance to the current mining methods. The pegmatite body is over 3 km long (north by northwest), up to 300 m wide (normal to dip), strikes north to north-west and dips moderately to steeply west to south-west. The syn-tectonic development of the pegmatite has given rise to mylonitic fabrics, particularly along host rock contacts.

The Greenbushes pegmatite is mineralogically segregated into five primary zones. Internally, the Greenbushes pegmatite consists of the Contact Zone, Potassium Feldspar (Potassium) Zone, Albite (Sodium) Zone, Mixed Zone and Spodumene (Lithium) Zone. The zones differ from many other rare-metal pegmatites in that they do not appear concentric, but are lenticular in nature, with inter-fingering along strike and down dip. They do not have a quartz core. The mine sequence was later subjected to the transgressive east-west dike and conformable sill dolerite intrusions.

The highest concentrations of primary ore minerals are found in specific mineralogical zones or assemblages within the pegmatite. The high-grade lodes within the main pegmatite body exhibit variable dips from 80 to 20° towards the west and south-west. Tantalum (tantalite) and tin (cassiterite) mineralization is concentrated in the Sodium Zone which is characterized by albite (Na-plagioclase), tourmaline and mica (muscovite). The Lithium Zone is enriched in the lithium bearing silicate spodumene. The mixed zone contains lower concentrations of tantalum and lithium. The final major zone is the potassium feldspar microcline which is not as economically important.

In general, the hanging wall to the pegmatite bodies is composed of amphibolite (meta-basalt and sub-volcanic intrusive bodies) whereas the footwall is granofels, dominantly of metasedimentary origin. The amphibolites and dolerites contain occasional stringers and pods of sulphides such as pyrite, pyrrhotite and chalcopyrite. Arsenopyrite and arsenolamprite (native arsenic) are noted in some areas, particularly within granofels and amphibolite inliers in the main pegmatite. Accessory minerals in the pegmatite are apatite and small amounts of beryl and garnet. Waste rocks are not as well-logged or understood at the same level of detail as the pegmatites in general.

Weathering and erosion of the pegmatites has produced adjacent alluvial deposits in ancient drainage systems. These are generally enriched in cassiterite. All rocks have been extensively lateritized during Tertiary peneplain formation; the laterite profile locally reaches depths in excess of 40 m below the original surface.

The C3 Pit shown in Figure 6-3 contains the main lithium deposit. The lithium ore deposit occurs within a large (250 m wide) lithium enriched pegmatite. Spodumene in the Lithium ore zone can make up more than 50% of the rock with the remainder being largely quartz. Toward the northern end of C3 pit, a highly felspathic (K-feldspar) zone separates the high-grade lithium zone from the hanging wall amphibolite and the dolerite sill. Tantalum/tin and lithium ore body mineralization are conformable with the trends of the pegmatites both along strike and down dip.

Between C3 and C1 is the mining area referred to as C2. The pegmatite in this area dips approximately 40° west and has an intermediate composition with moderate lithium oxide Li_2O

values and moderate tantalum pentoxide (Ta_2O_5) values. This is in contrast to C1 and C3 which have large distinct zones of separate Li_2O and Ta_2O_5 high grade.

At the southern end of the Central Lode pits is the C1 pit area. It contains the next largest concentration of high grade spodumene lithium mineralization after C3. The eastern footwall contact in the south of the C1 area dips 35 degrees west steepening toward the north and with depth. The internal grade domains in C1 parallel the eastern footwall contact. The immediate footwall is enriched in tantalum with typical accessory minerals tourmaline and apatite visible. Above are zones of lithium mineralization crosscut by deep weathering near surface altering the pegmatite to kaolin. Moving north the dip of the pegmatite shallows and the lithium domain at more than 1% Li_2O is discontinuous.

6.2.1 Structure

Shear structures in the pegmatites are most strongly developed at margins and in albite rich zones. The orientation of shear fabrics is sub-parallel to the regional Donnybrook–Bridgetown Shear Zone indicating pegmatite intrusion was synchronous with this deformational event. Folding postdates mylonization of the albite zone yet predates or is synchronous with later stages of crystallization. Dilatant zones formed in footwall albite zones during folding and were infiltrated by late stage Sn-Ta-Niobium (Nb) rich fluids which may be the sites for a second stage of high-grade mineralization. Later stage discordant structures have also been interpreted, the most obvious being the “Footwall Fault”, a sub-vertical structure striking north-south across the deposit. Faulted zones vary in structural intensity from heavily jointed to disintegrated rock greater than 30 m in width.

6.2.2 Mineralogy

As stated above, internally the Greenbushes pegmatite displays up to five mineralogically defined zones (Figure 6-4); the Contact Zone, K-Feldspar (Potassium) Zone, Albite (Sodium) Zone, Mixed Zone and Spodumene (Lithium) Zone. Zones generally relate to multiple phases of intrusion and crystallization of the pegmatites.

The zones occur as a series of thick layers commonly with a lithium zone on the hanging wall or footwall, K-feldspar towards the hanging wall and a number of central albite zones. High-grade tantalum mineralization (more than 420 grams per tonne [g/t]) is generally confined to the Albite zone within the deposit. The Spodumene and K-Feldspar Zones typically have tantalum-tin grades of less than 100 ppm.

Table 6-1 summarizes the main minerals associated with the historically economic elements Tantalum (Ta), Tin (Sn) and Lithium (Li) at Greenbushes. Currently, only Lithium minerals are exploited and processed at Greenbushes.

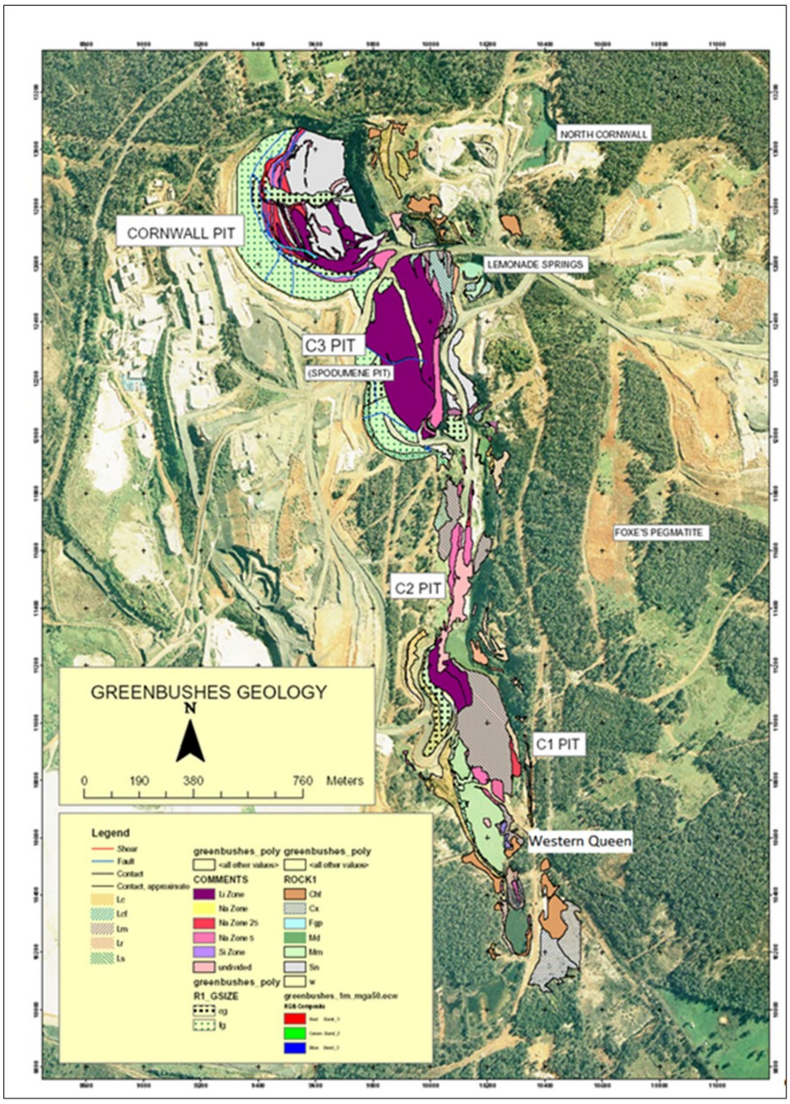
Table 6-1: Major Lithium and Tantalum Ore Minerals

Tantalum	Composition	Lithium	Composition
Columbo Tantalite	$(Fe,Mn)(Nb,Ta)_2O_6$	Spodumene	$LiAlSi_2O_6$
Stibio Tantalite	$(Nb,Ta)SbO_4$	Varieties	
Microlite	$((Na,Ca)_2Ta_2O_6(O,OH,F))$	Spodumene – White	
Ta – Rutile (Struverite)	$(Ti,Ta,Fe^{3+})_3O_6$	Hiddenite – Green	(Fe,Cr)
Wodginite	$(Ta,Nb,Sn,Mn,Fe)_{16}O_{32}$	Kunzite – Pink	(Mn)
Ixiolite	$(Ta,Fe,Sn,Nb,Mn)_4O_8$	Other Lithium Minerals	
Tapiolites	$(Fe,Mn)(Ta,Nb)_2O_6$	Lithiophilite	$Li(Mn^{2+},Fe^{2+})PO_4$
Holite	$Al_6(Ta,Sb,Li)[(Si,As)O_4]_3(BO_3)(O,OH)_3$	Amblygonite	$(Li,Na)Al\ PO_4(F,OH)$
Tin		Holmquisite	$Li(Mg,Fe^{2+})_3Al_2Si_8O_{22}(OH)_2$
Cassiterite	SnO_2	Lepidolite	$K(Li,Al)_3(Si,Al)_4O_{10}(OH)_2$

Source: Talison, 2018

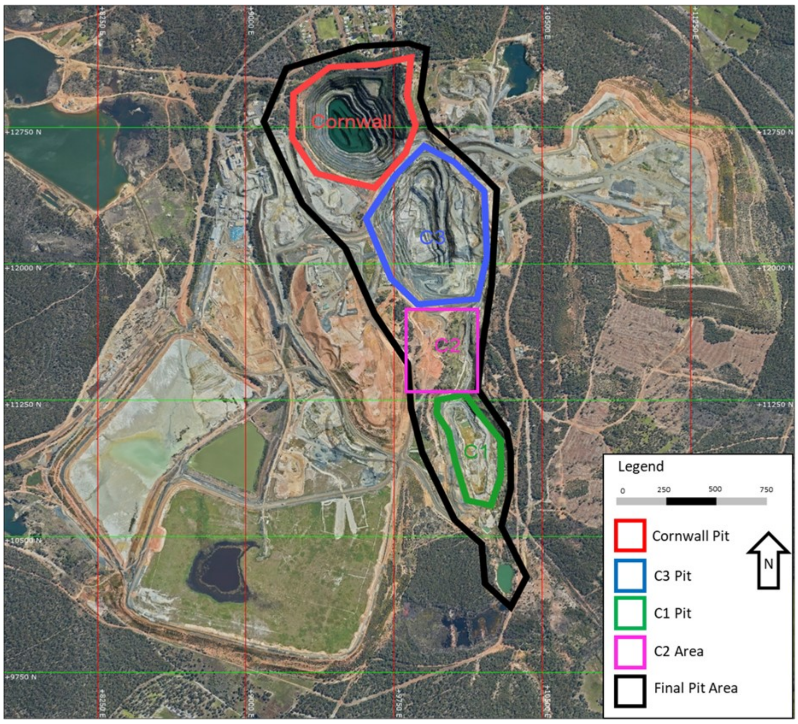
Major minerals are quartz, spodumene, albite and K-feldspar. Primary lithium minerals are spodumene, $LiAlSi_2O_6$ (~8% Li_2O) and spodumene varieties kunzite and hiddenite. Minor lithium minerals include lepidolite (mica), amblygonite and lithiophilite (phosphates). Spodumene is hard (6.5-7) with an SG of 3.1-3.2. Highest concentrations (50%) of Spodumene occur in the C1 and C3 pits.

When spodumene is weathered and oxidized the lithium ions leach into the environment, the result is spodumene pegmatite weathered to clay. This is of little to no economic value to the current operation. Oxidation of the pegmatites has generally occurred in near-surface weathering or along selected structures internal to the pegmatites. Only the near-surface weathering is considered to materially affect the pegmatite from a process mineralogy standpoint.



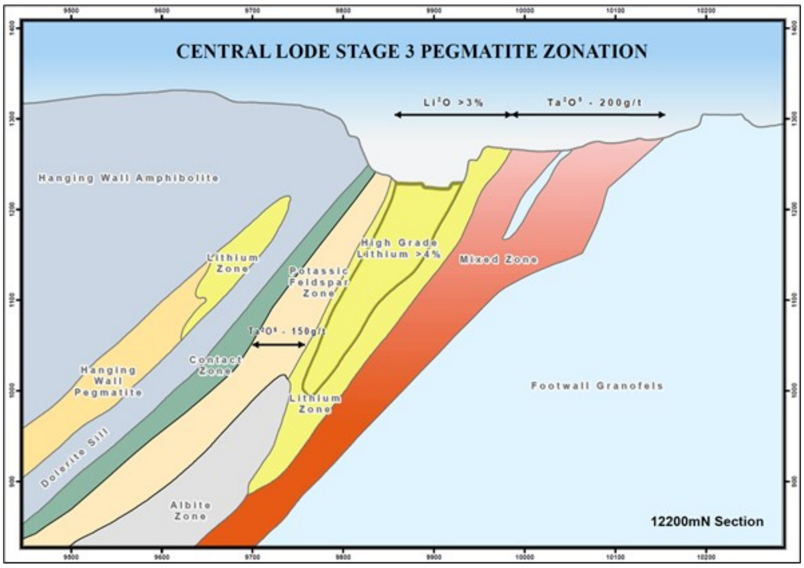
Source: Talison, 2018

Figure 6-2: Greenbushes Local Geology Map



Source: SRK, 2020
Note: Aerial photo taken from 2017.

Figure 6-3: General Area of Interest Nomenclature – C1, C2, C3, and Cornwall Pit Areas



Note: Section looking north.
Source: Modified from BDA, 2012

Figure 6-4: General Stratigraphy and Greenbushes Pegmatite Mineral Zoning

7 Exploration

1.1 Exploration Work (Other Than Drilling)

The primary mechanism of exploration on the property has been drilling for the past 40 years. While other means of exploration such as geological mapping, surface geochemical sampling, and limited geophysics have been considered or applied over the years, weathering and associated leaching of the near-surface pegmatites results in economic lithium mineralization not commonly being recognized via surface investigations (BDA, 2012).

For the purposes of this report resource and reserve estimate, in SRK's opinion, active mining, exploration drilling, and in-pit mapping provide the most relevant and robust exploration data for the current mineral resource estimation. In-pit mapping of the pegmatite and waste rocks is the most critical of the non-drilling exploration methods applied to this model and mineral resource estimation, as detailed in Section 11 of this report.

The area around the current Greenbushes Lithium Operations has been mapped and sampled over several decades of modern exploration work. While other nearby exploration targets have been identified and developed over the years, they are not included in the mineral resources disclosed herein and are not relevant to this report.

SRK utilized pit mapping from Talison geologists to refine the geological modeling.

7.2.1 Significant Results and Interpretation

SRK notes that the property is not at an early stage of exploration, and that results and interpretation from exploration data is generally supported in more detail by extensive drilling and by active mining exposure of the orebody in multiple pits.

1.2 Exploration Drilling

Drilling at Greenbushes has been ongoing for over forty years. There are a total of 1,166 reverse circulation (RC) and diamond drill holes (DDH) drill holes to date which support the geological model and mineral resource. The drill hole database has been compiled from more than 25 contracted drilling companies. The original RC drilling dates back to 1977 in the most current drilling in the database is as recent as 2020. There are 563 RC holes in the database, 14 combination RC and DDH holes, 585 DDH holes, and four holes that are of an undefined/unknown type. A complete breakdown is shown in Table 7-1.

Table 7-1: Holes by Type Included in the 2020 Resource Statement

Type	# Holes Drilled	Total Meters
DDH	380	74,360
DIA	1	172
DIA BTW	199	30,583
DIA/BTW	5	1,044
RC	563	78,333
RC/DDH	14	4,904
Trench	1	186
Blank	3	310
Total	1,166	189,892

Source: SRK, 2020

7.2.1 Drilling Surveys

Resource drillholes contained in the Greenbushes database date back to 1979. More recent (post-2000) down hole surveys used Eastman Single Shot cameras, while the later reverse circulation (RC) programs (since hole RC214) utilized either a gyroscopic or a reflex electronic tool. Eastman down-hole surveys were recorded at 25 m down hole and thereafter every 30 m to a minimum of 10 m from the final depth. The geologist checks the driller's dip and azimuth written recordings by viewing all single shot photographic discs prior to data entry into the database.

Prior to 2000, surveys were based on a variety of industry standard methods that cannot be verified but, in SRK's opinion, can be relied upon. Checks of surveys within the database, by comparing overlapping data between older and post 2000 drill holes, support the opinion that the surveying is reliable. Some of the RC holes drilled before 2002 were apparently not down-hole surveyed and were instead given linear design parameters based on collar orientations in the database. Also, some of the older vertical diamond holes were not down-hole surveyed. In SRK's opinion, this is not a material issue given the relatively shallow drilling depths and tendency of vertical holes to not significantly drift.

The location of recent surface drill hole collars is surveyed by the mine surveyors using a differential GPS system accurate to less than 1m. Historical collars were surveyed using industry standard equipment available at the time and are reliable in SRK's opinion. Environmental rehabilitation programs to relocate historical collars using their coordinates and a handheld GPS have been successful and acts as a validation of historical collar surveys.

During drilling of angled holes, the drillers use cameras survey tools to take surveys at approximately every 30 m as the hole progresses. Upon the completion of recent holes gyroscopic tools have been run to give closer spaced readings not influenced by ground magnetics. Vertical holes are typically surveyed less regularly and only at the end of hole for holes less than 100 m depth. Holes intersected during mining are surveyed and comparisons to the hole trace show the down hole surveys are reliable (Talison, 2020).

7.2.2 Sampling Methods and Sample Quality

The Greenbushes pegmatite is sampled by a combination of RC and diamond drilling programs. The drill patterns, collar spacing, and hole diameter are guided by geological and geostatistical requirements for reliability of geological interpretation and for confidence of estimation in mineral resource block models.

Drill core samples provide intact geological contact relationships, mineralogical associations and structural conditions, while RC drill sampling provides mixed samples from which mineral proportions are estimated by visual examination.

A sample interval of 1 m is used as the maximum default length in RC and diamond drilling. Analysis of the deposit characteristics has been used to determine the appropriate sample interval in drill holes.

Distinguishing the dark internal and hosting waste rock from the light pegmatites in drill core is clear and obvious. Where unaffected by shearing, the geological contacts are abrupt, often regular and intact. Although contact relationships are masked in RC chips, the pegmatite/waste contact positions are inferred within the sample length. Both diamond drill and RC drill holes are distributed throughout the lithium deposits (Talison, 2020).

7.2.3 Diamond Drilling Sampling

In SRK's opinion, diamond drill holes (DDH) are considered by most to be authoritative and the most representative sampling of subsurface materials available. Diamond core is collected in trays marked with hole identification and down hole depths at the end of each core run. Pegmatite zones are selected while logging and intervals are marked up for cutting and sampling. All pegmatite intersections are sampled for assay and waste sampling generally extends several meters on either side of a pegmatite intersection. Internal waste zones separating pegmatite intersections are routinely sampled, although in a small proportion of holes drilled prior to 2000 some waste zones separating pegmatite lenses have not been assayed.

Core recovery is generally above 95%. A line of symmetry is drawn on the core and the core is cut by diamond saw. Historically BQ and NQ core has been half core sampled with more recent HQ core quarter cut and sampled. The typical core sampling interval for assay is 1 m, but shorter intervals are sampled to honor geological boundaries and mineralogical variations.

To date, in SRK's opinion, diamond core recovery and sampling is suitable for the purposes of mineral resource estimation.

7.2.4 RC Drilling Sampling

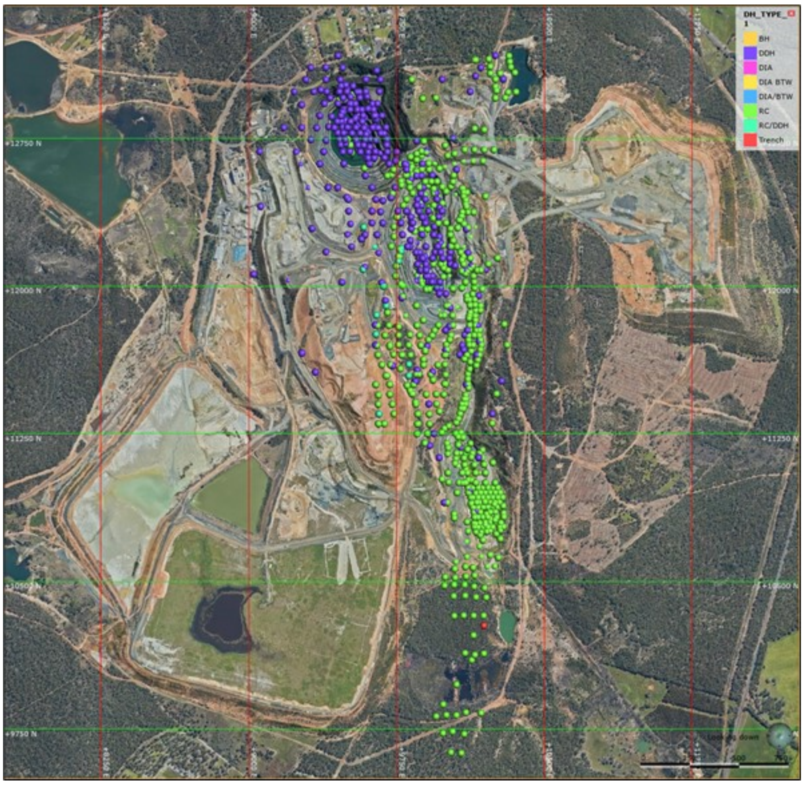
RC samples are collected by face sampling hammer for every meter drilled over the full length of the hole via a cyclone attached to the rig and split at the rig by the drilling contractor using either a riffle splitter, rotating cone splitter or stationary cone splitter. A sample of approximately 3 to 4 kg is submitted to the laboratory. In some old RC holes, the regular sampling length was 2 m. Field duplicates are taken every 20 m and submitted to the laboratory for quality assurance/quality control (QA/QC) purposes. RC drill hole bit size is normally approximately 4.5 inches or 5.25 inches. The drilling conducted since the last resource update were all drilled using a 5.25 inch bit size.

All pegmatite intersections are submitted for assay. The sections sampled will normally extend several meters into the waste rock hosting the pegmatite. As with diamond drilling, internal waste zones separating pegmatite intersections are also sampled, although in some old holes some of this internal waste sampling is incomplete. Pegmatite intersections are visually distinguishable from waste zones in drill chips during drilling.

Drill cutting reject piles are reviewed by site geologists when geological logging and intervals with poor recoveries are recorded. The drill samples are almost invariably dry, and recoveries are consistently high (Talison, 2020).

7.2.5 Drilling Type and Extent

The drilling at the project is both RC and DDH which extends from south of the C1 pit to north of the Cornwall pit. The holes are drilled in a variety of orientations, primarily vertically or perpendicular to the pegmatite. There is approximately 1,189,895 m of resource drilling. Holes are spread relatively uniformly and at reasonable spacings throughout the Central Lode deposits, and mineralization is defined by exploration drilling at 25 to 50 m drill spacings for exploration purposes. More detailed grade control drilling is conducted in near-term production planning areas, as are very detailed blast holes during production.



Source: SRK, 2020

Figure 7-1: Drilling Type and Extents

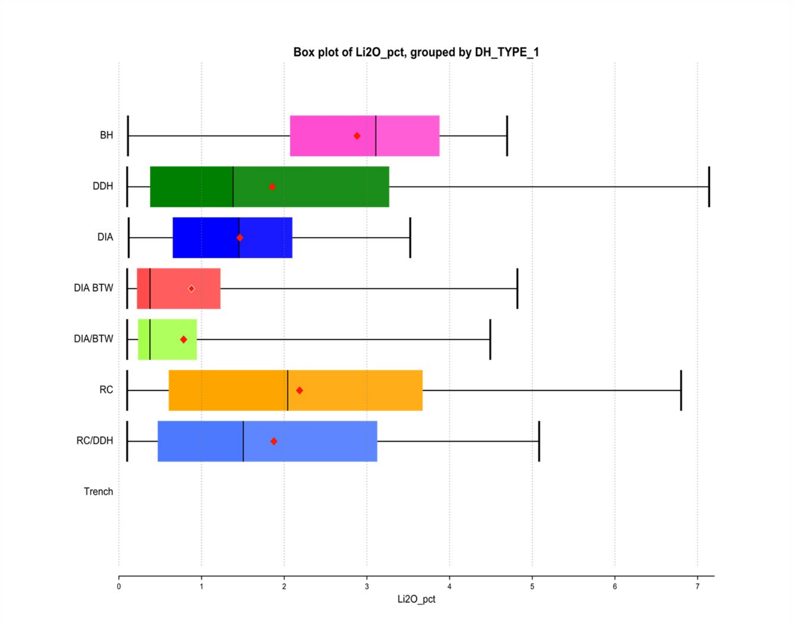
7.2.6 Drilling, Sampling, or Recovery Factors

SRK is not aware of any material factors to the drilling that would affect the results.

To evaluate the various types of drilling, SRK compared overall means of multiple drilling types on a global and local basis. Global comparisons for drill types are shown in Figure 7-2, and demonstrate that the different types do feature different mean % Li_2O values. In SRK’s opinion, the spatial component of where the specific type of drilling occurred is the source of variance in the means at a global comparison scale. For example, it is natural that the blast hole data or the RC data (which features closely spaced grade control drilling) would be higher grade on average than the DDH drilling, which is sparser, exploration focused (i.e. finding the limits of the orebody), and less likely to be located in the higher grade portions of the pegmatite.

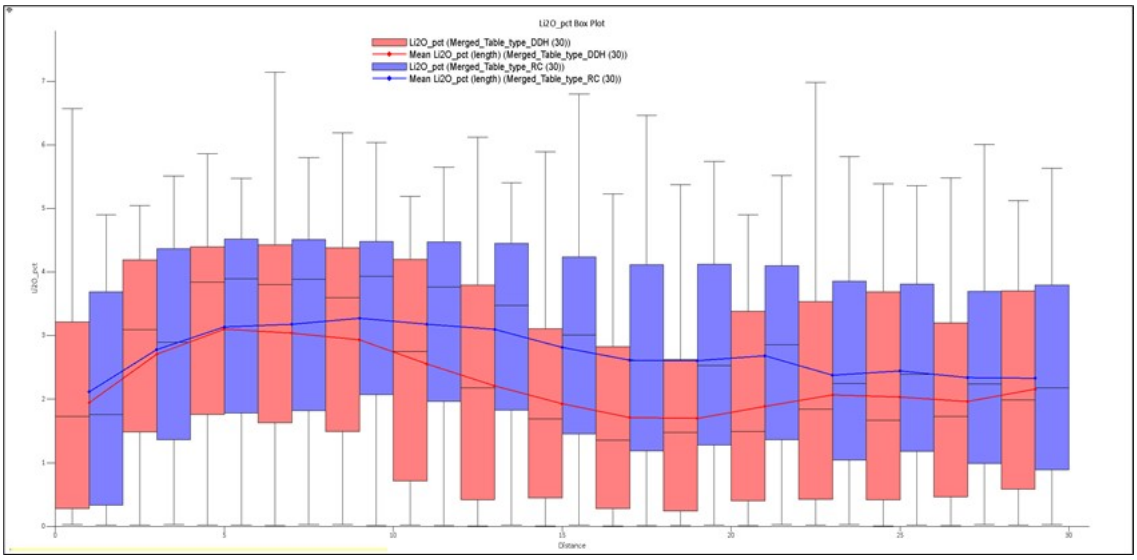
SRK notes that only DDH and RC drilling were considered for the mineral resource estimation (i.e. not blast holes) and that these data types were compared on a more local basis as well.

To do this, RC samples were compared against paired closely-spaced DDH samples based on the distance between the two, and SRK noted similar trends in grade distribution between the two data types as shown in Figure 7-3. These comparisons feature excellent comparison of RC and DDH sample grades at very close spacings, with deviations happening at distances greater than approximately 10m. In SRK's opinion, is of the opinion that this likely reflects inherent geologic variability or variability of grade within the pegmatites rather than a consistent bias in drilling methodology. SRK also notes that, as distances between samples increase to more global populations, that the inherent spatial bias of the RC grade control drilling (preferentially located within the ore zones of the pegmatite) likely influences overall global comparisons to favor the RC drilling with a higher mean Li_2O.



Source: SRK, 2020
Note: BH = Blastholes, DDH = Diamond Drill Hole, DIA = Diamond Drill Hole, DIA/BTW = Diamond Drilling Thin Wall, RC = Reverse Circulation, RC/DDH = Reverse Circulation with Diamond Drill "Tail"

Figure 7-2: Box and Whisker Plot – Li_2O by Drilling Type



Source: SRK, 2020
Note: Only RC vs. DDH drilling shown.

Figure 7-3: Drilling Type Mean Comparison – By Average Separation Distance

To consider the possible impact of drilling recovery (only noted in DDH drilling) SRK reviewed recovery information for those holes where it was logged.

Recovery logs are made of all diamond drill core as a part of the standard logging procedure which includes collection of geological, mineralogical and structural information. Core recoveries within the fresh pegmatite range from 95% to 100%. SRK noted no bias in Li_2O or relationship with recovery in those samples where both are noted.

Weight measurements are made of RC samples from selected holes to understand potential impacts with recovery in RC drilling, but are not quantitative due to the drilling method. Site geologists also inspect the size of the cutting piles, and intervals differing from the norm in size or moisture content are noted on drill logs. RC sample recovery generally has been assumed to be excellent.

7.2.7 Drilling Results and Interpretation

SRK utilized the logged geology to develop geological models utilizing industry standard 3D implicit modeling practices. Talison uses the drilling information for the same process, as well as detailed short term modeling and grade control/mine planning.

Analytical data for Li_2O and other elements was interpolated in 3D to develop geochemically distinct domains within the geological model and were driven by structural or interpreted grade continuity models.

7.3 Hydrogeology

SRK reviewed the previous groundwater and surface water studies at Greenbushes, including water balance and groundwater modeling.

The hydrogeologic data collected indicate that the mineral resource is overlain by a relatively low permeability groundwater system consisting of lateritic caprocks and well developed saprolitic clays which yield very little water. Beneath these weathering products, exists a sharp to gradual transition into the fractured bedrock. Within this transition zone the variably weathered bedrock and remnant fractures form the highest yielding groundwater due to the enhanced permeability. Deeper within the bedrock, localized faults and fractures may result in enhanced permeabilities. Based on testing completed, hydraulic conductivity (K) for the weathered bedrock zone ranges from 0.01 m/d to 1 m/d, while the bedrock (pegmatite/greenstone) has a K of 3.0 x 10-4 m/d to 6.0 x 10-3 m/d (GHD, 2019a), although it should be noted that these values are based on bulk averages within a fracture bedrock groundwater system.

Local aquifers are hosted within the surficial alluvial sediments (where present), at the interface between the saprolitic profile and the underlying basement rocks, and within the deep fracture basement rocks. In general, the alluvial aquifers received most of the recharge from precipitation, with limited vertical migration through the lower clay-rich sediments, to the bedrock contact zone and deeper. Any impacts from TSF seepage would be limited to the alluvial aquifer, with only minimal probability of infiltration to deeper groundwaters.

In SRK’s opinion, the completed hydrogeologic studies, collected data, and subsequent analysis is appropriate for the overall low hydraulic conductivity of the local hydrogeologic system.

7.4 Geotechnical Data, Testing and Analysis

A geotechnical study for the Central Lode LoM pit for the Greenbushes operations was conducted by PSM Consult (2020). The Central pit is currently in operation, and they have good experience with slope and bench performance. In SRK's opinion, the geotechnical data collected has sufficient coverage around the pits to demonstrate knowledge of pit sector characterization and strength properties of the rock mass. SRK has not conducted any new field geotechnical work for this report. Rather we have reviewed and rely on the work conducted by PSM.

Data Collection

The characterization data comprised geotechnical borehole logging, televiewer interpretation, oriented core logging, geotechnical mapping, photogrammetry, piezometer and laboratory testing data from historical and recent site investigation programs. The data collected from the 2018/2019 investigation represents a substantial increase in the available geotechnical data for Greenbushes.

Geology and Structure

The Greenbushes Pegmatite Group is situated within the regional-scale Donnybrook-Bridgetown Shear Zone. On a mine-scale, the geology consists of amphibolites and granofels which host the pegmatite intrusions, and late mafic dolerite dikes and sills which intrude the entire sequence. A weathering profile extends to about 30 m below the surface (up to 60 m in places).

Major geologic structures are at or nearby major lithologic contacts and faults/shears that are typically steeply to moderately dipping to the west. Two primary fault zones will impact slope stability. The Northern Dolerite Sill Fault Corridor is exposed in the current Cornwall and C3 pits. The Pegmatite Shear Zone (PSZ) consists of soil to low strength rock material located behind the northern portion of the west wall. The orientation of the PSZ dips favorably into the wall, has a thickness of 20 to 50 m and the spatial extent appears to be limited by the lack of exposure in the Cornwall Pit and boreholes south of 12,000N.

Structural Domains

11 structural domains were identified from televiewer and photogrammetry data. The west wall has steeply dipping structures with variability from north to south and within the Dolerite lithologies. The Pegmatite is separated into two domains with the main set steeply to moderately dipping to the west.

Discontinuity shear strengths were assessed from direct shear tests and using typical joint characteristics from logging. The shear strength ranged from 36° to 41° friction with assumed zero cohesion. The estimated strengths also considered lithology, defect shape and roughness characteristics.

Rock Mass Strength

The rock mass was separated into 14 units based on weathering, lithology and strength characteristics. Below the near-surface upper weathered zone the rock masses are high strength with UCS values from 50 to 190 MPa, with the exception of the PSZ which is very weak rock. Strengths were assessed using GSI values, except for the upper weathered zone where triaxial test results were used.

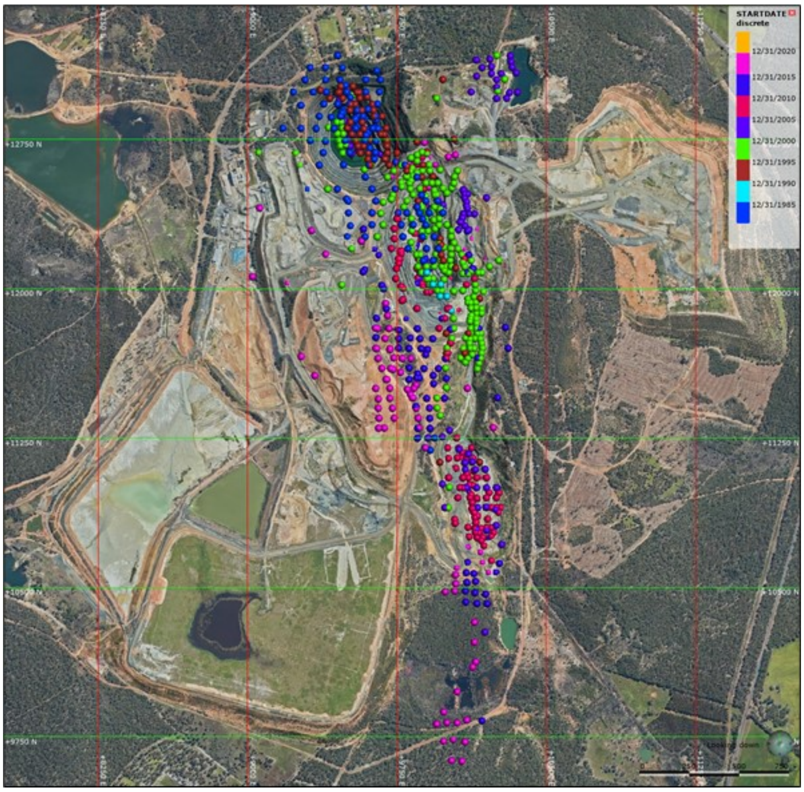
Hydrogeology

The impact of hydrogeology on slope stability has been limited due to insufficient data. Vibrating wire piezometers were installed during the recent field investigation. The water table is estimated to be between 30 to 60 m below surface at the base of the weathered zone. It is understood that perched aquifers form during winter from precipitation recharge; however, connectivity of the perched aquifer is uncertain.

Data Gaps

Uncertainties in the geotechnical model include the following:

- Variability in the upper weathered zone and location of the contact between the Granofels and Amphibolite behind the east wall
- The character and orientation of modeled faults, the extent of the PSZ and the length and waviness characteristics of structures
- Rock mass conditions within the PSZ and strength of Amphibolite units behind the east wall
- The pore pressure response to mining of the basement geology and the connectivity with the weathered zone



Source: SRK, 2020

Figure 7-4: Plan View Illustrating Exploration Drilling by Date

8 Sample Preparation, Analysis and Security

8.1 Sample Preparation Methods and Quality Control Measures

Quoted and modified from the 2018 Central Lode Resource Update (Talison, 2018), this section covers the best-known information about sample preparation, with added appropriate information for 2020.

Drill samples from RC drilling programs are collected and bagged at the rig as drilling progresses. The RC samples are collected in sequential, pre-numbered bags directly at a discharge chute on the sample splitter to which the sample bag is attached. The splitter is either fed via a closed sample collection circuit at the drill hole collar or is fed manually from a sample bagged at the cyclone.

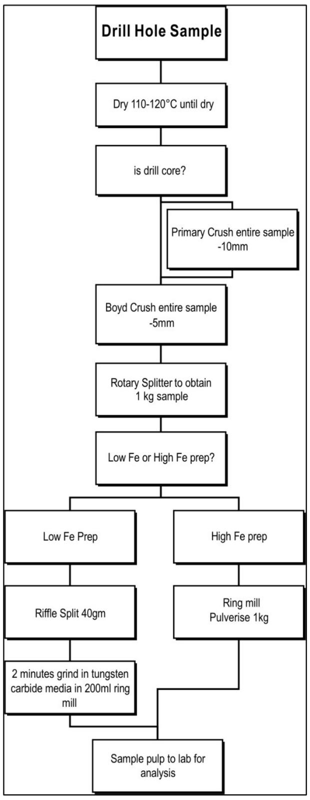
Drill core samples are also collected sequentially in pre-numbered sample bags after cutting with a diamond saw. The integrity and continuity of the core string is maintained by reassembling the core in the tray. If any apparent geological discontinuities are noted within or at the end of core runs these are resolved by the logging geologist.

All sample preparation and analytical work is undertaken at the operation’s on-site laboratory, which is ISO 9001: 2008 certified and audited in accordance with this system, most recently in June 2016. The Greenbushes laboratory provides quick and secure turn-around of geological samples using well established quality control procedures. The laboratory also services processing plant samples and samples from shipping products.

Upon submission to the laboratory, samples are entered into the laboratory sample tracking system and issued with an analytical work order and report (AWOR) number. Separate procedures have been developed for RC and diamond drill samples.

Preparation, analysis and management of geological samples are covered comprehensively in laboratory procedures. The sample preparation flow sheet is shown in Figure 8- and can be summarized as follows: all samples are dried for 12 hours at a nominal 110ºC; thereafter samples are passed through a primary crusher to reduce them to minus 10 millimeters (mm), followed by secondary crushing in a Boyd crusher to -5 mm. A rotary splitter is used to separate an approximate 1kg sub-sample, which is ground in a ring mill to minus 100 µm.

Historically, two routes have been used for the preparation of geological samples. The first utilizes standard ferrous pulveriser bowls, while the second uses a low iron preparation method with a non-ferrous tungsten bowl. The low iron preparation as shown in Figure 8-1 has been used for all samples in recent drilling programs. All resource drilling sample pulp residues are retained in storage. Coarse sample rejects are normally discarded unless specifically required for further test work. Sample preparation is carried out by trained employees of the company in the Greenbushes site laboratory following set laboratory procedures.



Source: Greenbushes 2018 Resource Update

Figure 8-1: Greenbushes Drill Hole Sample Preparation Procedure

8.2 Sample Preparation, Assaying and Analytical Procedures

Excerpted from the 2018 Central Lode Resource Update (Talison, 2018), this section covers the best-known information about assay preparation, with added appropriate information for 2020.

Due to the long history of operations at Greenbushes, the meta-data regarding assaying is somewhat incomplete; however, the recording of analytical data has been at the current standard since at least 2006. As far as can be determined, all assaying of drill samples has been by XRF and Atomic Absorption Spectroscopy (AAS). The majority of samples have been analyzed for 36 elements at the Greenbushes laboratory. Sodium peroxide dissolution and AAS is used for Li_2O

determination. The other elements/oxides are analyzed by XRF following fusion with lithium metaborate. The analysis of geological samples for Li_2O by AAS and other elements/oxides by XRF is documented in laboratory procedures.

Over time, the detection limits of some elements assayed at the Greenbushes laboratory have improved, as outlined in Table 8-1, with implications for the accuracy of some of the older assays in the database. This appears only to be significant for the low concentration elements and has no material effect on the resource model estimates. Current detection limits remain as listed for PW2400 (low level) June 2001. Detection limits are stored in the acQuire geological database.

Table 8-1: Greenbushes Laboratory Detection Limit History

Element	Detection Limit (%)		
	PW1400 - 1983	PW2400 – Nov 1995	PW2400 (Low Level) – June 2001
Ta_2O_5	0.005	0.005	0.001
SnO_2	0.005	0.005	0.002
Li_2O	0.010	0.010	0.010
Na_2O	0.005	0.005	0.005
K_2O	0.005	0.005	0.005
Sb_2O_3	0.005	0.005	0.002
TiO_2	0.005	0.005	0.005
As_2O_3	0.005	0.005	0.005
Nb_2O_5	0.005	0.005	0.002[1]
Fe_2O_3	0.005	0.005	0.005
U_3O_8	0.005	0.005	0.002

[1] The detection limits for June 2001 are current apart from Nb_2O_3, which reduced from 0.005% to 0.002% in 2010
Source: BDA, 2012

In 2002, a proportion of underground drill core samples were sent to the Ultra Trace Pty Limited Laboratory in Perth, WA, for analysis. XRF was used to analyze for Ta, Sn and other components, and ICP for Li_2O analysis.

8.3 Quality Control Procedures/Quality Assurance

The majority of this summary comes from previous public reporting (BDA, 2012) and internal Talison reporting on mineral resource updates as of 2018. The processes and procedures are the same at the effective date of this report.

QA/QC systems at Greenbushes have developed over time and therefore vary for the dataset used for the 2020 Mineral Resource Estimation. Duplicate field samples are collected and analyzed for RC drill holes but not diamond core samples. Current RC drilling practice is to submit a field duplicate sample for every 20 samples submitted. These duplicates are collected in the same way as the routinely assayed samples. Results are recorded in the acQuire database software and QA/QC reports generated for each drill program.

The quality of the recent drill program was accepted for Li_2O resource estimation. QA/QC relating to all previous drilling has been completed and data accepted with each successive drill program and resource update.

8.4 Assay QA/QC

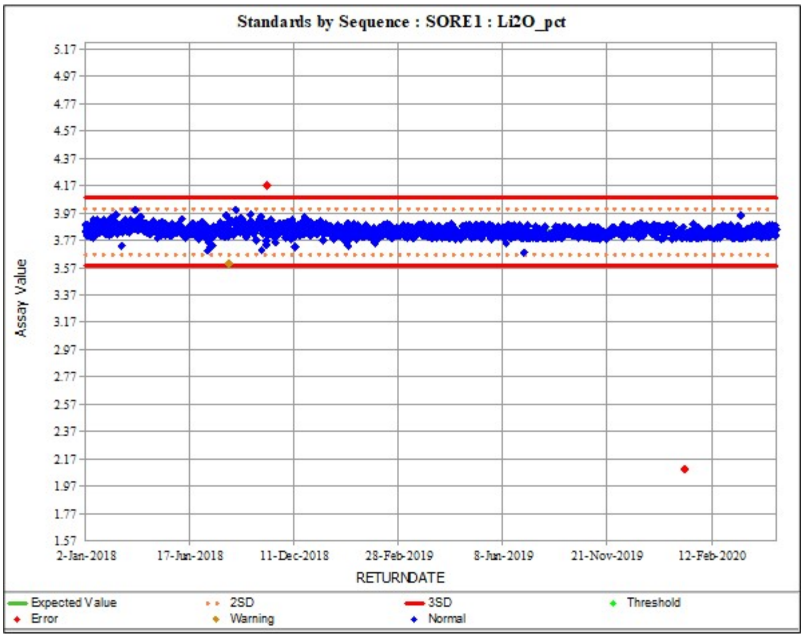
QA/QC systems have relied upon the Greenbushes laboratory's internal quality systems, which include replicate (pulp repeat) laboratory analyses and analysis of known standards by XRF, both included in each batch of drill samples. Greenbushes also has participated in round-robin reviews of analyses with other independent laboratories as checks on their internal processes. Li_2O in geological drill samples is not analyzed in replicated samples to calibrate the machine; instead, the AAS machine is recalibrated before every batch of samples.

Known solution standards and blanks are embedded in each batch and the accuracy of the calibration is monitored regularly during the analysis of each batch. The results are also captured in the database. The precision of the AAS analysis technique is statistically monitored using plant processing and shipping data. In SRK's opinion, the resulting precision at mining grades is of high quality and confirms the quality of the AAS method employed.

In SRK's opinion, the QQ plots of RC drill sampling results do not indicate any significant bias between the original and check sample populations. Scatter plots of original and field duplicates for Li_2O from recent RC holes show less variability than the same plot over all the RC resource holes suggesting a reduction in sample error. Plots for half absolute relative difference (HARD) show less sampling error in recent RC data compared to the overall RC data. A scatter plot for Li_2O replicates from RC samples shows acceptable repeatability of results.

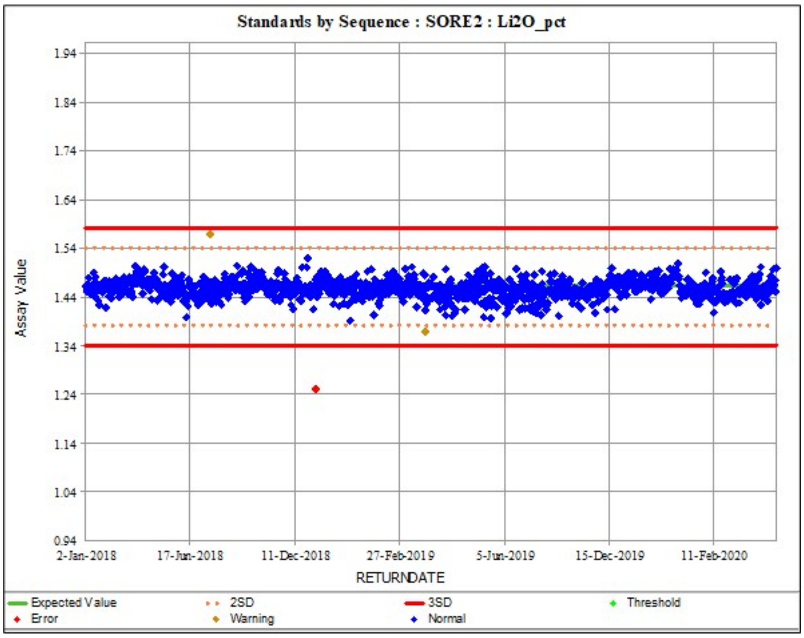
8.5 QA/QC - Recent Drilling

The post-2016 RC drilling samples were submitted to the site laboratory with the geology department submitting custom certified reference material (CRM) standards SORE1 and SORE2. The CRM was prepared by ORE Research and Exploration Pty Ltd in early 2014 from run of mine material having grades and matrix relevant to the deposit. The custom geological standards SORE1 and SORE2 performed within 2SD for Li_2O analysis in all 403 laboratory batches since January 2017. Talison has continuously evaluated and monitored the QAQC and noted this performance for all relevant sampling, so the analytical accuracy for the database is considered acceptable for Indicated and Inferred resource reporting (Figure 8-2 and Figure 8-3) in SRK's opinion.



Source: Talison, 2020

Figure 8-2: Results for CRM SORE1



Source: Talison, 2020

Figure 8-3: Results for CRM SORE2

Approximately 5% of pegmatite samples submitted to the laboratory are duplicated in the field. The results are first reviewed using a scatter plot (Figure 8-4) during the drilling program and duplicates with greater than 20% variation investigated. As the reliable determination level of the laboratory is 0.05% Li_2O, duplicates with Li_2O assays less than 0.2% Li_2O are ignored for monitoring. A primary sample of 0.2% Li_2O with a duplicate of 0.25% Li_2O would present as an error with half absolute relative difference (HARD) of 11%.

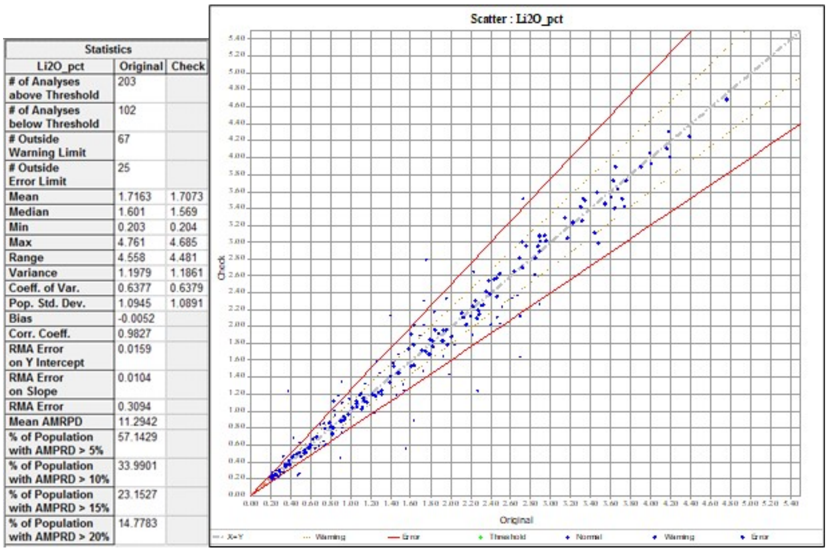
Errors include misallocation of the duplicate pair by the rig geologist when creating the sample listing in excel due to dragging number formulas down the sheet. This will result in the sample allocation being 1 m out on the hole and a sample paired with its adjacent sample rather than it's duplicate. This error is resolved by going back to the written field sample collection sheet.

Another common error is a similar miss ordering of samples through the laboratory process. In the last couple of years barcode labelling and QR readers have greatly reduced the opportunity for sample miss ordering in the laboratory. There are still a couple of processes such as when samples are dissolved in solution in reusable glassware that rely on good procedure and keeping things ordered. This will also offset sample location by 1 m on drill holes, on a review of the returned results a preceding or following sample will show as essentially identical to the duplicate rather than the result reported. Note that the whole 36 element suite is correlated for a sample not just the Li_2O value.

Samples are taken for every meter drilled so field duplicates not resolved by the previous two methods are typically addressed by re-splitting the bagged sample and submitting the second sample (a duplicate) for several samples around the failure. Good correlation of the additional duplicates to their samples confirms the original sample allocation on the hole is correct. Where poor correlation remains and there is no confidence in the alignment of results to the hole then the whole assay job may be re-split to get acceptable results which was the case for an assay job on RC484 which was clearly mixed up in the laboratory.

There are some failed duplicates that remain unresolved which are interpreted to be due to the natural variation within a coarse-grained variable mineralogy at the sample location. These have strong correlation between many elements in the assay suite but differ on several others. These will often occur in a mixed mafic and pegmatite mineralogy where a sample interval crosses a lithology boundary.

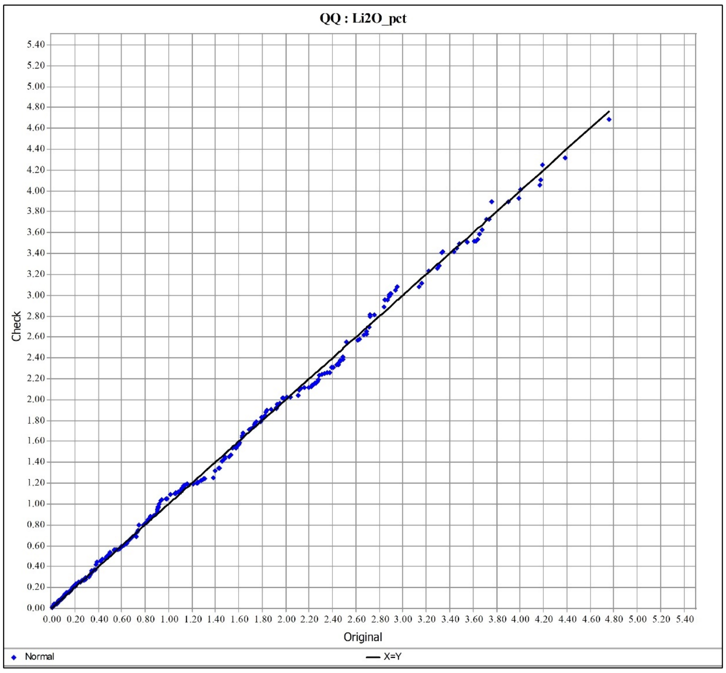
Some remaining failed duplicates are interpreted to be due to poor drilling conditions that affect a sample either natural such as water coinciding with a duplicate position or mechanical such as hydraulic failure of splitter mechanisms. There are some that will be due to poor field practice. The simple (although time consuming) resolution of many failed duplicates to show the underlying data, in SRK’s opinion, was representative and gives enough confidence in the dataset to use for MRE of Li_2O. A QQ plot (Figure 8-5) of field duplicates during recent drilling does not show bias between the primary and duplicate sample populations. The splitter hygiene and operation during the program is therefore interpreted as acceptable.



Statistics		
Li2O_pct	Original	Check
# of Analyses above Threshold	203	
# of Analyses below Threshold	102	
# Outside Warning Limit	67	
# Outside Error Limit	25	
Mean	1.7163	1.7073
Median	1.601	1.569
Min	0.203	0.204
Max	4.761	4.685
Range	4.558	4.481
Variance	1.1979	1.1861
Coeff. of Var.	0.6377	0.6379
Pop. Std. Dev.	1.0945	1.0891
Bias	-0.0052	
Corr. Coeff.	0.9827	
RMA Error on Y Intercept	0.0159	
RMA Error on Slope	0.0104	
RMA Error	0.3094	
Mean AMRPD	11.2942	
% of Population with AMPRD > 5%	57.1429	
% of Population with AMPRD > 10%	33.9901	
% of Population with AMPRD > 15%	23.1527	
% of Population with AMPRD > 20%	14.7783	

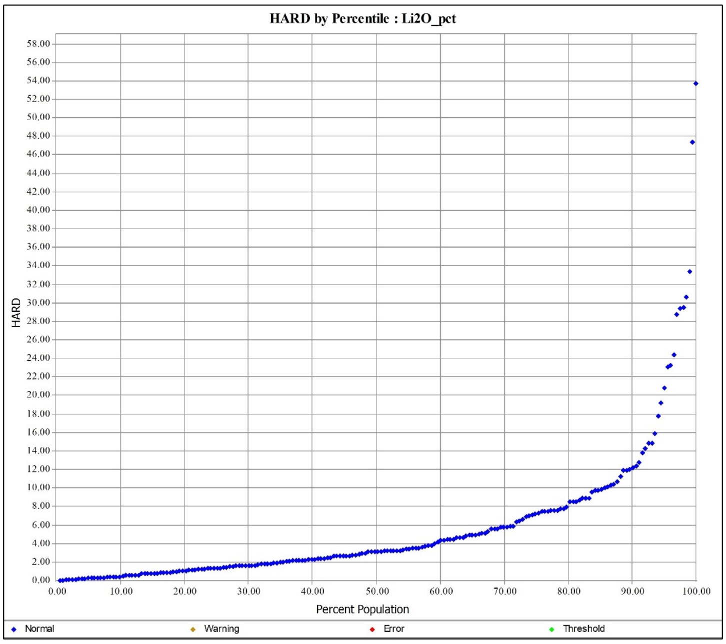
Source: Talison, 2020

Figure 8-4: Scatterplot of Recent Field Duplicates >0.2% Li_2O



Source: Talison, 2020

Figure 8-5: QQ Plot of Field Duplicates Post-January 2016



Source: Talison, 2020

Figure 8-6: HARD Plot of Field Duplicates Post January 2016

A HARD plot displays 85% of the data with Li_2O >=0.2% has a HARD value of less than 10% which is acceptable for the current level of disclosure (Figure 8-6).

8.6 Opinion on Adequacy

SRK has reviewed the sample preparation, analytical and QAQC practices employed by Talison for the Greenbushes deposit, and notes the following:

- In SRK’s opinion, the current and historical analytical procedures are or were consistent with conventional industry practices at the time that they were conducted. The majority of the resource is supported by modern drilling with recent QAQC, and analyses as described above.
- In SRK’s opinion, recent QAQC is robust in design and monitoring and demonstrates that the analytical process is sufficiently accurate for supporting mineral resource estimation.
- SRK has considered the historical nature of the drilling, and the limited QAQC associated with it, in the mineral resource classification.

9 Data Verification

The database was verified by SRK via the use of scripting to test the available lab assay certificates against the database assay values. Tests were set up on a pass/fail basis for each element in each of the available samples. Failures were individually analyzed to ensure the error was not due to logic failures in the scripting.

SRK was provided a total of 6,918 usable assay certificates the earliest of which date from 2006. More certificates in multiple formats were provided (pdf, excel, csv, paper) which cover the period prior to 2006 of which many are not material to the Central Lode area.

9.1 Data Verification Procedures

Verification was completed by compiling analytical information provided in the supplied certificates and cross referencing with the analytical file for the project. Analytical certificates in both Comma Separated Value (CSV) and Excel (XLS) file format were used in verification. As mentioned, certificates were supplied in other formats including pdf and paper; however, verification was not attempted on those.

Verification on the on the XLS and CSV data was done using the Python scripting language to merge and compare the certificate data against the analytical file (Table 9-1). Tests were done on the string values of Li_2O geochemistry from the certificates, matched by sample ID. Assumptions for these tests in comparing the data sets are as follows:

- In cases where the merged file’s value was below the detection limit, half the lower limit of detection was applied.
- For example, <0.01 became 0.005 for comparison purposes

Merged results from the comparison were imported back to Excel for comparison and analysis. Matched tests were assigned a numeric code of “1,” and failures a “0.” Through this analysis, SRK compared 45,408 records from the database against the original analytical data and noted a match rate of over 98.5%. Errors were likely related to the challenges in matching samples between data sets (see Section 9.2).

Values were identified for Li_2O comparison from 51.9% of the data used in the mineral resource estimation. The complete analytical file includes 87,412 samples. From the analytical certificates provided, SRK was able to identify 45,408 unique samples.

Table 9-1: Data Verification Summary

Number of samples in the assay file for comparison	87,412
Number of samples identified in the lab certificates for comparison	45,408
Total percentage of samples compared from the assay file	51.9%
Number of tests compared per sample	1 (Li_2O)
Maximum number of possible matches between identified lab certificate sample and assay file samples when comparing	45,408
Actual number of matches between lab certs and assay database when comparing sample tests	44,761
Percentage of matched tests	98.5%

Source: SRK, 2020

Assay Sheet Data Quality Analytic Procedure

The sample IDs in the assay sheets contained a widely varying set of characters with little consistency. “Fuzzy” matching was attempted to correlate nomenclature across laboratories and generations of data, but mismatches in the naming is likely the source of the majority of the failed comparisons.

Example: Sample ID from certificate: UGX10362.

SRK tested the assay database for:

- UGX10362
- *GX10362
- *X10362
- *10362

If no matches are found, then there is no comparison for this sample.

Duplicate sample IDs in the assay sheets were eliminated from analysis unless all values from duplicate samples were identical.

Within the analytical certificates provided, and due to variability in the naming, formatting, and characters of the sample IDs described in the lab assay sheets, only 45,408 unique sample IDs of the 87,412 sample IDs from the digital drilling database (51.9% of the total) were able to be corresponded to sample IDs in the assay sheets across both verification phases.

Data Comparison

SRK compared Li_2O grades only for the matched assays from assay sheets and the digital database.

Of these 45,408 values in the assay database, there were 647 mismatches between the values recorded in the assay database and the lab assay sheet resulting in an error rate of approximately 1% (1.42%) and a match rate more than 98% (98.58%) in the assay database.

Li_2O values for all corresponding sample IDs were compared and any value which did not match was failed. Only those values which matched were identified as a “pass.”

Errors were provided to Talison, and failures are primarily attributed to shifts in sample nomenclature which could not be dealt with through the scripted data comparison, or mis-identified duplicates as noted in previous sections.

9.2 Limitations

Certificates for lab samples were given to SRK in two batches with the second batch especially difficult to identify in relation to the assay file. Many of the sample IDs in the certificates appeared to have a changing nomenclature scheme that was not reflected in the assay file. As a result, matching many of the assay samples with appropriate sample from lab certificates was challenging.

SRK was unable to perform a site or laboratory visit to verify the stated procedures are being followed. All details and data on QA QC methodology are second-hand and provided by Greenbushes personnel.

Although higher percentages for validation could be completed, the time associated with the process is prohibitive for the purposes of public reporting.

9.3 Opinion on Data Adequacy

In SRK's opinion, that the digital database provided by Talison is of sufficient quality to support mineral resource estimation. Very low incidents of failure were noted in the comparisons made to original source data, and explanations for failures are reasonable and common amongst mining projects with extensive histories and various generations of logging styles and analytical laboratories.

10 Mineral Processing and Metallurgical Testing

Greenbushes operates their Chemical Grade Plant-1 (CGP1) to recover spodumene from ore containing about 2.5% Li_2O into lithium concentrates containing about 6% Li_2O. The CGP1 process flowsheet utilizes unit operations that are standard to the industry including: ball mill grinding, HMS, WHIMS, coarse mineral flotation and conventional fine mineral flotation. In addition, Greenbushes completed the construction of their Chemical Grade Plant-2 (CGP2) during 2019 and has initiated commissioning of this facility.

As part of the process design for CGP2, Greenbushes conducted an evaluation of the use of HPGR as an alternative to the ball mill grinding circuit currently used in CGP1. The HPGR was determined by Greenbushes to generate fewer non-recoverable fines (less than 45 µm) and offer the potential of improving overall lithium recovery. The results of this evaluation are documented in the report, “Chemical Grade Plant Number 2, High Pressure Grinding Roll (HPGR) Study”, April 2017. The results of this study indicated the following benefits associated with the use of a HPGR instead of ball mill grinding in CGP2:

- Reduction in over-grinding of spodumene enables a reduction in lithium losses with the slimes.
- Better liberation of spodumene in coarse size fractions for improved HMS performance.
- Better liberation of spodumene in the fine fractions.
- Selectively grinding softer minerals than spodumene to a fine size. Iron minerals are therefore concentrated in the fine fractions where they are easier to remove in WHIMS.
- HPGR is easier to adjust on-line to suit variations in ore hardness compared to a ball mill circuit.

10.1 Metallurgical Testwork and Analysis

Greenbushes evaluated ball mill grinding versus HPGR comminution by comparing samples from the CGP1 banana screen undersize with samples from closed circuit HPGR testwork. For this analysis closed circuit HPGR crushing of -38 mm feed with a 3.35 mm closing screen was compared with crushing to 12 mm followed by closed circuit ball-mill grinding. This comparison gave an indication of the wt% and Li_2O grade reporting to heavy media separation, coarse flotation, fine flotation and the potential slime losses.In order to estimate the effect that shifting the lithium distribution has on estimated plant yield and recovery, heavy liquid separation (HLS) tests were conducted on selected samples at specific gravities ranging from 2.70 to 3.32 gram per cubic centimeter (g/cc). For this evaluation, lithium reporting to HLS sink products at specific gravities greater than 2.96 g/cc were considered 100% liberated. HLS tests were conducted on plant feed prepared by ball mill grinding (CGP1), conventional crushing, low pressure HPGR comminution and high pressure HPGR comminution. The results show improved liberation with the HPGR when compared to ball mill grinding or conventional crushing. Greenbushes used a combination of size distributions, Li_2O analysis of size fractions and liberation data to estimate the yield and lithium recovery that could result by using an HPGR instead of conventional ball mill grinding in the comminution circuit.

11 Mineral Resource Estimates

11.1 Key Assumptions, Parameters, and Methods Used

11.2 Geological Model

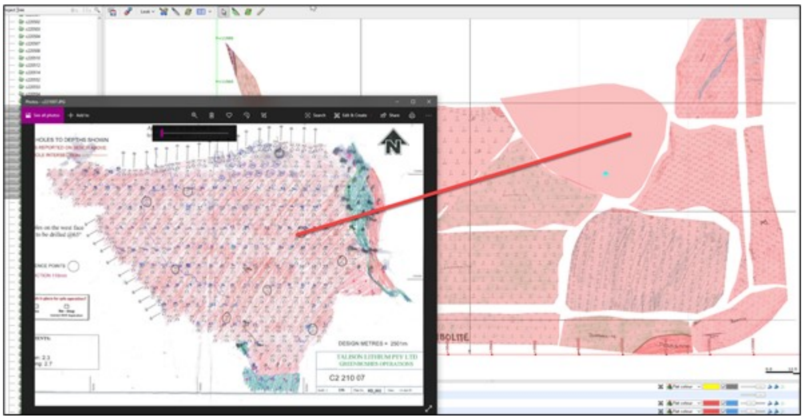
In order to constrain and control the MRE, a geological model was required to approximate the geological features relevant to the estimation of mineral resources, to the degree possible, given the data and information generated at the current level of study. SRK developed this model, in collaboration with Greenbushes geologists and Albemarle personnel, to leverage the site-based expertise and improve the overall model consistency. Geological information supporting the development of the model was generally collected by Greenbushes geologists and contractors.

The geological model is comprised of multiple features which have been modeled to either be independent of each other or, in some cases, may depend on the results from another modeling process. An example of this, is the way in which a structural model may influence the results of the lithology model or the final resource boundaries.

The combined 3D geological model was developed in Leapfrog Geo software (v5.1.1). In general, model development is primarily based on lithology logging from drilling but incorporates a range of other geological information including;

- Alteration and mineralogical logging
- Geological mapping (historic and modern)
- Interpreted cross sections (historic and modern)
- Surface/downhole structural observations
- Historic drill logging (historic samples are not incorporated into the MRE)
- Interpreted polylines (surface and sub-surface 3D)

Of note is the integration of extensive pit mapping from individual mapping sheets, compiled into a mosaic image and draped on relevant periodic topographic surfaces to when the mapping was conducted. As shown in Figure 11-1, these sheets denoting benches or specific production areas were georeferenced and draped over topography to enable digitization of contacts for rock types at very fine detail. This provides excellent geological context in addition to the dense drilling and enables the model to rely on observations made in the pit which may or may not have been as well defined by the drilling.



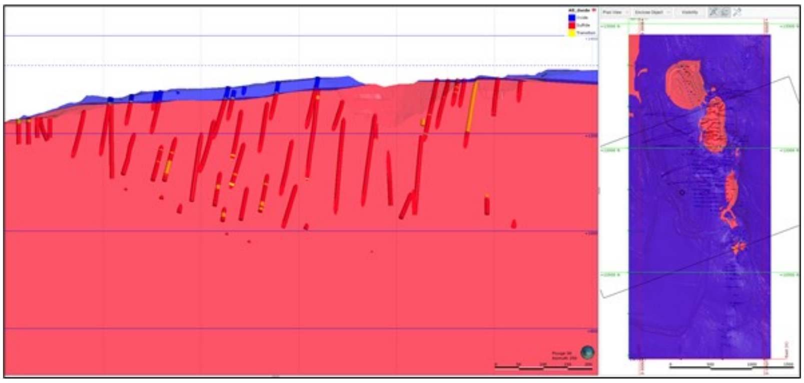
Source: SRK, 2020

Figure 11-1: Example of In-Pit Geological Mapping Integration for 3D Modeling

The models developed for Greenbushes were designed to address the complex and multifaceted nature of the area geology. This includes an oxidation model for characterizing oxidized, transition, and fresh material, a lithology model for characterizing and quantifying geological bodies present, a depletion model to address previously mined out material, and a number of numerical models to identify and segregate domains by geochemical indicators (lithium).

Oxidation Model

The oxidation model was developed by grouping coding within the geologic logging into three categories. The original data provided by Greenbushes has five subjective categories: extreme (e), high (h), moderate (m), weak (w), and fresh (f). The general grouping used by SRK, grouped extremely and highly oxidized material as “Oxide” (e, h) and non-oxidized or “Fresh” rock (m, w, f). SRK considered the moderately oxidized or transition material (where logged) as a part of the overall fresh rock zone. A small quantity of codes was subjectively changed to produce a more geologically believable model. This occurred if they were either out of place geologically, very small and averaged into another unit, or inherently inaccurate due to variances in logging criteria over time. Though the original assignment of oxidation values was subjective and varied from logger to logger, the broad categories used were suggested by Greenbushes personnel and are thought to be reasonable in SRK’s opinion.



Note: Section looking southwest
Source: SRK, 2020
Note: Logged transition intervals are incorporated into fresh rock for the purposes of simplifying the model.

Figure 11-2: Cross Section View of Oxidation Model

Lithology/Structural Model

The lithology model was developed by first creating grouped and selectable lithology tables in Leapfrog Geo. Codes which generally defined pegmatite (P and PC for example), were grouped into a single pegmatite code for the purposes of modeling. The same technique was applied to other primary rock types. An interval selection table was then built from the grouped codes, to allow for designation of more detailed features such as the dozens of discrete dolerite dikes. The pegmatite was created as an intrusive model and utilizes drilling intercepts to model contacts between pegmatite and other older/host rock contacts using structural trends from regional and pit-level geological observations. It was further refined through use of digitized polylines and polygons which were digitized either by Greenbushes personnel based on interpretation, drawn on bench-level pit maps, or created constrain pegmatite extents where drillhole data was sparse. Pegmatites of less than 2.5 m were filtered out and not inherently modeled implicitly.

In addition to the pegmatites, SRK modeled other in-situ waste rock types such as amphibolites (A), granofels (G), and dolerites (D). Amphibolites were modeled as intrusions around the pegmatite and dolerites, based on the observed regional trend of the known amphibolites. SRK notes that the amphibolites are certainly more extensive than what is currently defined by the model, but the data external to the drilling area is sparse. Granofels were modeled as the external host rock outside of all other rock types, although it is likely a mix of amphibolite, dolerite, and granofels. Dolerites were primarily modeled as intrusions with trends based on observations from pit mapping, regional interpretation from drilling, and the overall continuity observed in sections. The notable exception is for the many dolerite dikes which are modeled as “veins”, generally from selected intervals in drilling as defined by Talison geologists, digitized interpretations from observations made by exploration personnel, or digitized in-pit bench mapping. Finally, surficial (erosional) rock types were grouped as alluvial material and modeled together as a near-surface depositional feature which overlies all older rock types. SRK also modeled fill material within the pit areas or in tailings/waste construction areas to the degree that this data was available in drilling/mapping. This model should not be the authoritative perspective on fill materials, as other studies or data exist which likely provide more detail on quantities and conditions of fill materials for construction or infrastructure.

No major brittle structures were modeled as a part of this work, as structural data defining brittle faults in the pit is minimal. Talison geologists have noted that offsetting or brittle structural features are not critical to the current geological understanding, so SRK has not modeled them from the limited data available. Structural data was incorporated as strike and dip measurements from the pit areas, as well as overall 3D interpretations on trends for pegmatites and dolerites separately. These were developed along section and in 3D views based on the mapping and drilling intervals.

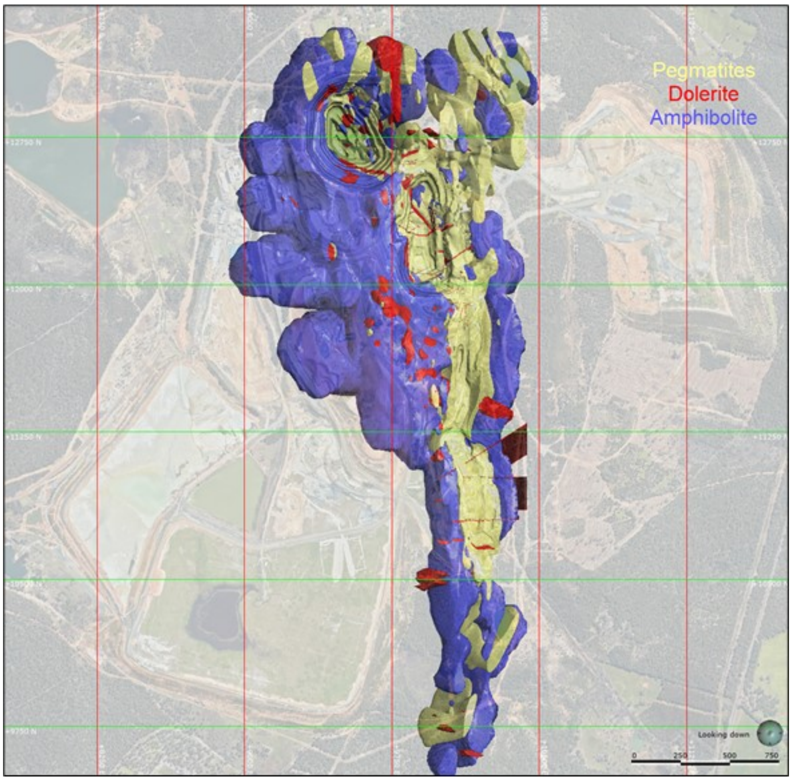
The geological model is shown in plan view and cross section in Figure 11-3 and Figure 11-4.

In SRK's opinion, the level of data and information collected during both the historic and modern exploration efforts is sufficient to support the geological model and the MRE. In some cases, geological information was used to define trends or general morphology of units. For some units, "snapping" of the model to data types was utilized, wherein others were left to approximate logging intervals in cases where close-spaced drilling was at odds with mapping in the pit at a lower resolution than the model itself is capable of addressing. These occurrences are few but did exist within the pit areas. To examine the relative accuracy of the modeling process against the reality of the logging, SRK examined the overall percentages of logged other rock types contained within the modeled pegmatites, and vice versa (Table 11-1). SRK notes that the pegmatite model features an internal dilution of 3.15%, with the majority of dilutive material being associated with internal dolerite dikes for the pegmatite. SRK notes that, given the local internal complexity of the pegmatites and the waste rocks, that this type of internal dilution for a geological model is appropriate.

Table 11-1: Model vs. Drilling Comparison

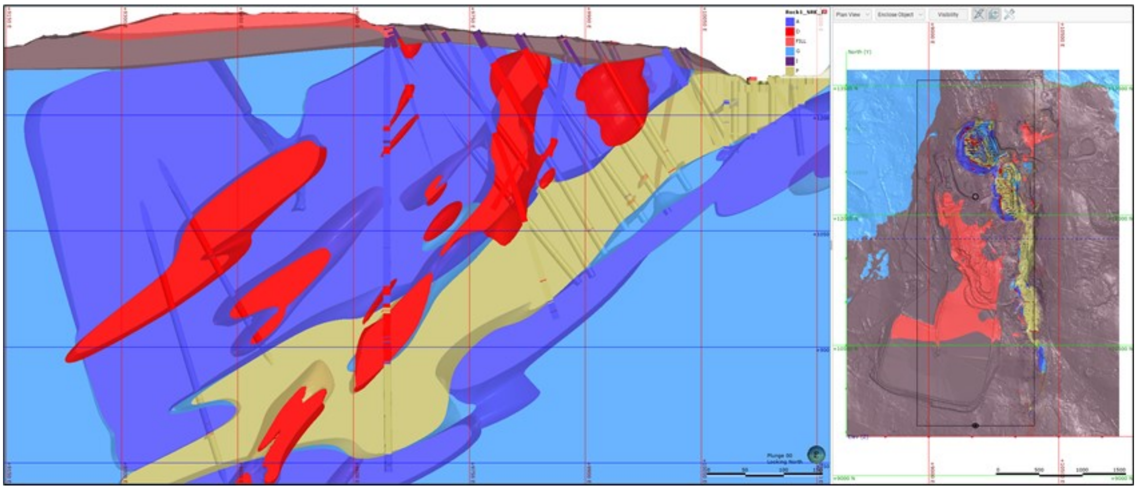
Model Values Matching Drilling Pegmatite		
Model Lithology	**Model Length (m)**	**Percent Length**
Pegmatite	109,891	96.85%
Dolerites	2,578	2.27%
Surface(Alluvial)	570	0.50%
Granofels	304	0.27%
Amphibolites	121	0.11%
Model Values Matching Drilling Amphibolites		
Model Lithology	**Model Length (m)**	**Percent Length**
Amphibolites	39,930	98.17%
Pegmatite	219	0.54%
Granofels	204	0.50%
Dolerites	180	0.44%
Surface(Alluvial)	141	0.35%
Model Values Matching Drilling Dolerites		
Model Lithology	**Model Length (m)**	**Percent Length**
Dolerites	14,793	94.25%
Pegmatite	571	3.64%
Surface(Alluvial)	124	0.79%
Granofels	124	0.79%
Amphibolites	85	0.54%
Model Values Matching Drilling Granofels		
Model Lithology	**Model Length (m)**	**Percent Length**
Granofels	17,226	95.74%
Dolerites	361	2.01%
Pegmatite	274	1.52%
Surface(Alluvial)	99	0.55%
Amphibolites	32	0.18%

Source: SRK, 2020



Source: SRK, 2020
Note: Granofels and surface/alluvial material removed.

Figure 11-3: Plan View of 3D Lithology Model



Source: SRK, 2020
Note: Looking North and section width +/- 50m

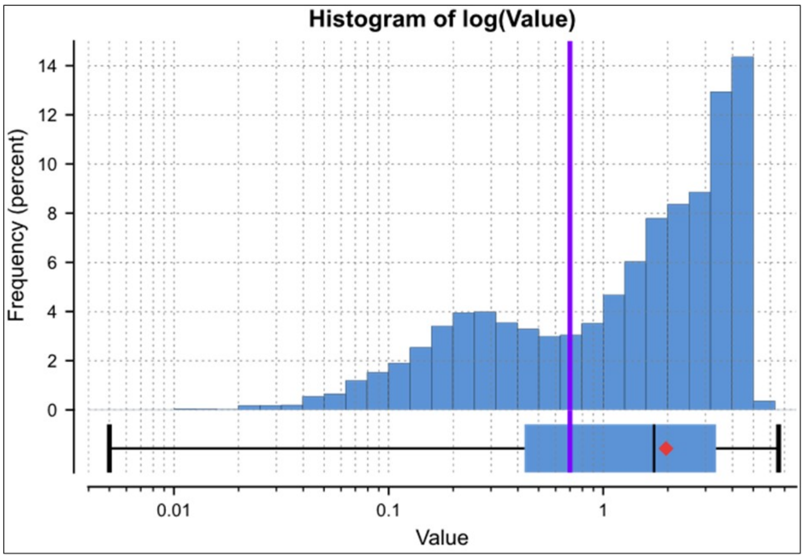
Figure 11-4: Cross-Section View of Geological Model

Mineralization Model

Historically, the pegmatite geological model has been separated into spodumene-dominant pegmatite and pegmatites which may feature less spodumene or be more tin-tantalum rich. Talison has found in previous years that a 0.7% Li_2O cut-off for analyses tends to define this spodumene-rich pegmatite domain well. SRK conducted some initial exploratory data analysis on the Li_2O assays within the pegmatite geological model, and notes that there is a fairly distinct bimodal population in a histogram of the Li_2O as shown in Figure 11-5. Visualizing these intervals on section and 3D above and below the 0.7% Li_2O CoG (Figure 11-6) show that these >=0.7% assays do define a relatively contiguous and spatially discrete area of the pegmatite that corresponds to interpretation of higher spodumene pegmatite.

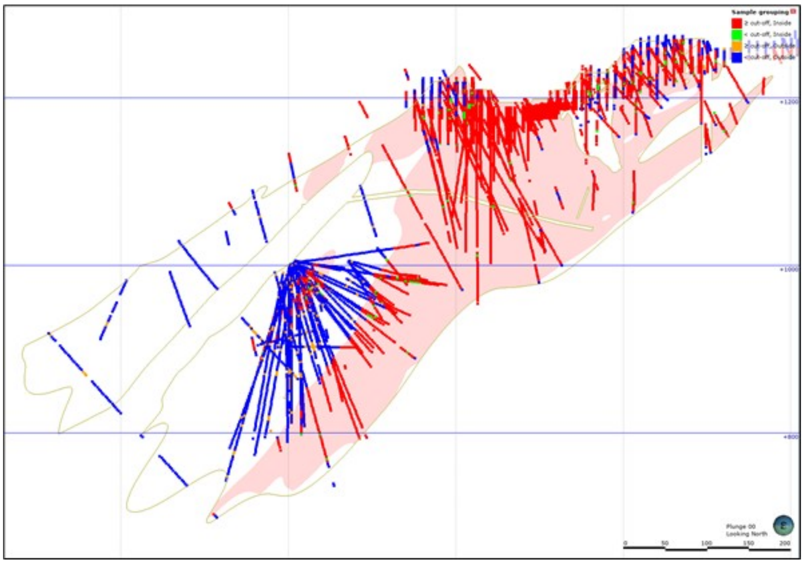
SRK elected to model the spodumene-rich portions of the pegmatite using an indicator interpolation approach, bound by the pegmatite itself but considering the overall internal structural trends as defined by the pegmatites. The indicator modeling process was conducted also using Leapfrog Geo, compositing the samples to a 3 m nominal length, with a probability factor for the indicator of 50%. SRK reviewed this probability factor (as well as a suite of cut-off grades) in the context of geological continuity defined by the continuous Li_2O variable, relative dilution of intervals below the CoG, and exclusion of those intervals above the CoG, and comparison to the geological volumes as shown in Table 11-2. Tables like this were produced for every scenario and reviewed along with the wireframe itself with Talison geological staff for reasonability with interpretation. The resulting shape comprises about 36% of the overall pegmatite body, generally in the upper portions (although it does plunge in the northern areas under C3). Lithium does occur external to this shape, but as noted in the statistics for the model, approximately 4% of samples above the CoG are excluded. Internal to the indicator model, approximately 4% of total samples are included which are below the CoG.

SRK utilized the >0.7% Li_2O indicator volume internal to the pegmatite as the higher-grade domain for estimation, and remaining pegmatite as the lower grade domain for estimation.



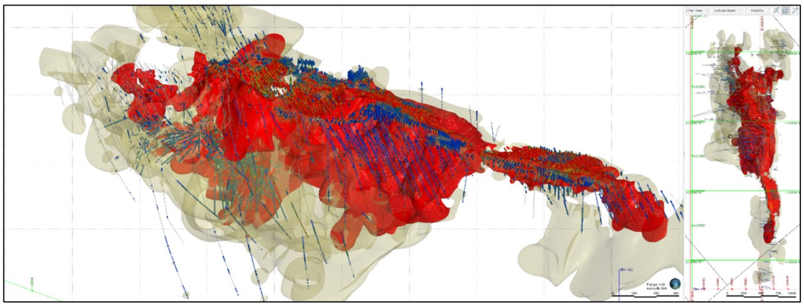
Source: SRK, 2020

Figure 11-5: Li_2O Histogram of Raw Assays Internal to Pegmatite



Source: SRK, 2020

Figure 11-6: Pegmatite Distribution of Composited Li_2O Assays Around 0.7% Li_2O



Source: SRK, 2020
Note: >0.7% Li_2O = Red, <0.7% Li_2O = Yellow

Figure 11-7: Perspective View of 0.7% Li_2O Spodumene Pegmatite

Table 11-2: Statistics for Li_2O Indicator Model

Indicator Statistics	Li_2O - Pegmatite	
Total Number of Composites	46,960	
Cut-Off Value	0.7	
	≥ cut-off	**< cut-off**
Number of points	32,177	14,783
Percentage	0.69	0.31
Mean value	2.73	0.28
Minimum value	0.70	0.01
Maximum value	6.56	0.70
Standard deviation	1.23	0.17
Coefficient of variance	0.45	0.61
Variance	1.50	0.03
Output Volume Statistics		
Resolution	6.00	
Iso-value	0.50	
	Inside	**Outside**
≥ Cut-Off		
Number of samples	30,812.00	1,365.00
Percentage	66%	0.3%
< Cut-Off		
Number of samples	1,317.00	13,466.00
Percentage	0.3%	29%
All points	Li_2O	
Mean value	2.70	0.36
Minimum value	0.04	0.01
Maximum value	6.56	4.99
Standard deviation	1.27	0.41
Coefficient of variance	0.47	1.12
Variance	1.62	0.16
Volume	83,768,607	-
Number of parts	1	418
Dilution	4.1%	
Exclusion	4.2%	
Pegmatite Volume % Diff	230,100,000	36%

Source: SRK, 2020

11.2.1 Exploratory Data Analysis

After refinement of the geological model into the higher and lower grade Li_2O pegmatite, SRK conducted detailed exploratory data analysis on a wide range of elements within each domain. Of note were elements of potential economic interest, including Li_2O, Fe_2O_3, SnO_2 and Ta_2O_5. Additional elements for the purposes of density assignment or materials type characterization include MnO, Na_2O, P_2O_5 and SiO_2. Data was split on the basis of the resource development exploration drilling (RDEX) and the grade control (GC) drilling for this analysis, primarily due to the spatial distributions of each dataset. Raw sample statistics for the elements of interest, as well as specific gravity (SG) within the pegmatite are summarized in Table 11-3.

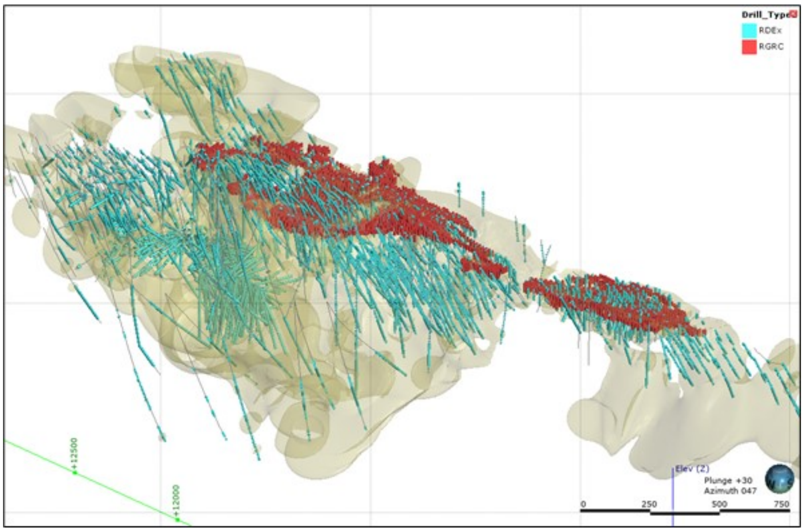
Of note, SRK had the following observations of the analyses within the pegmatite domains between the two data types:

- The GC drilling is consistently higher in average Li_2O content, due to the nature of it being almost entirely in the active mining areas. Other elements are generally similar.
- Elements are relatively consistently accounted for across the drilling types, with Mn and SiO_2 being the least-assayed-for amongst the elements of interest.
- The GC dataset, due to being isolated and clustered in the production areas, does show significant differences in internal variance of Li_2O (measured by the CV) and other elements.
- Other elements such as Sn or Ta are generally of very low quantities in the pegmatite, and do not occur in high enough concentrations to warrant consideration in the mineral resource.
- Fe_2O_3 % is also relatively low but is affected significantly by the contributions of limited waste samples from dolerite or amphibolite. Greenbushes geologists generally do not consider estimated Fe_2O_3 grades in the resource as definitive characteristics for materials typing or reporting, and instead rely on a calculated Fe variable from other elements.

Table 11-3: Descriptive Statistics for Raw Sample Data – RDEX vs. GC Within Pegmatite

Name		Count	Length	Mean	Standard Deviation	Coefficient of Variation	Variance	Minimum	Lower Quartile	Median	Upper Quartile	Maximum
RDEx		66825	78,219									
	Fe_2O_3_pct	63818	73,639	1.29	1.90	1.47	3.62	0.01	0.51	0.79	1.28	60.71
	Li_2O_pct	62591	72,117	1.46	1.40	0.96	1.96	0.00	0.26	0.95	2.40	7.14
	MnO_pct	54604	58,217	0.10	0.14	1.43	0.02	0.00	0.04	0.06	0.10	3.81
	Na_2O_pct	63880	73,713	3.28	2.25	0.69	5.08	0.00	1.51	2.78	4.64	20.78
	P_2O_5_pct	62066	71,185	0.38	0.56	1.46	0.31	0.00	0.15	0.24	0.37	10.56
	SG_d	1528	1,387	2.76	0.14	0.05	0.02	1.59	2.66	2.75	2.87	3.79
	SiO_2_pct	54604	58,217	72.22	5.68	0.08	32.25	18.51	69.86	72.96	75.35	97.39
	SnO_2_pct	64809	74,879	0.05	0.07	1.52	0.00	0.00	0.01	0.03	0.05	3.53
	Ta_2O_5_pct	66318	77,329	0.02	0.02	1.12	0.00	0.00	0.01	0.01	0.02	1.14
RGRC		30804	70,419									
	Fe_2O_3_pct	29292	66,747	1.53	3.35	2.19	11.22	0.03	0.24	0.41	0.78	29.41
	Li_2O_pct	29292	66,749	2.55	1.58	0.62	2.50	0.02	1.10	2.72	4.01	6.43
	MnO_pct	29292	66,747	0.05	0.06	1.04	0.00	0.00	0.03	0.04	0.06	2.03
	Na_2O_pct	29292	66,747	1.72	1.32	0.77	1.75	0.03	0.70	1.37	2.38	10.33
	P_2O_5_pct	29292	66,747	0.19	0.16	0.82	0.03	0.00	0.09	0.16	0.26	6.65
	SG_d	0	-									
	SiO_2_pct	29292	66,747	72.20	5.95	0.08	35.36	33.99	71.38	73.90	75.56	93.61
	SnO_2_pct	29292	66,747	0.02	0.03	1.68	0.00	(0.00)	0.01	0.01	0.02	1.75
	Ta_2O_5_pct	29292	66,747	0.01	0.02	2.00	0.00	0.00	0.00	0.01	0.01	3.19

Source: SRK, 2020
Note: Statistics are length-weighted and reported inside pegmatite geologic wireframe. Intervals may have been split for the purposes of statistical reporting across model domains.



Source: SRK, 2020
Note: Red holes are RC grade control, Blue are exploration (mixed RC/DDH)

Figure 11-8: Spatial Relationship of RDEX and GC Drilling

Based on these observations, SRK elected to only utilize the RDEX dataset for the purposes of estimation for the resource. Due to the extensive RDEX dataset which is far more spatially representative than the GC dataset, there are no material gains to be had from using the GC data for long term resource estimation purposes, and possible risk due to the clustered nature of the drilling and the observed bias in the GC sampling.

Considering then only the RDEX data, statistics were again reviewed for the data inside the 0.7% Li_2O pegmatite domain, and outside, as shown in Table 11-4. Other than expected increases in the Li_2O means, and relative decreases in Fe_2O_3, SRK notes that there also is far more SG data located in the higher grade domains than the lower. Sn and Ta tend to increase in the low-grade domain, consistent with observations of the Li-bearing pegmatites being broadly discrete from the Sn/Ta pegmatites. In general, the statistics support the domaining process by showing them to be geochemically and mineralogically distinct.

Table 11-4: RDEX Drilling Statistics, by Pegmatite Resource Domain

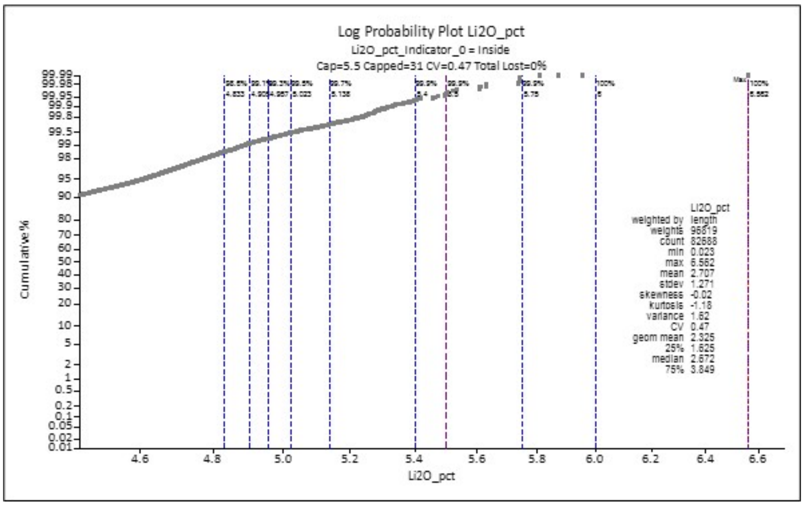
Name		Count	Length	Mean	Standard Deviation	Coefficient of Variation	Variance	Minimum	Lower Quartile	Median	Upper Quartile	Maximum
High Grade		36,998	43,052									
	Fe_2O_3_pct	35,345	40,292	1.02	1.59	1.57	2.54	0.01	0.46	0.67	1.00	32.35
	Li_2O_pct	35,646	40,793	2.32	1.28	0.55	1.64	0.00	1.28	2.14	3.38	7.14
	MnO_pct	29,482	30,289	0.07	0.09	1.37	0.01	0.00	0.03	0.05	0.07	3.13
	Na_2O_pct	35,326	40,259	2.29	1.53	0.67	2.35	0.04	1.08	2.04	3.23	20.78
	P_2O_5_pct	34,484	39,096	0.26	0.30	1.16	0.09	0.00	0.12	0.20	0.29	8.78
	SG_d	1,213	1,109	2.79	0.13	0.05	0.02	1.59	2.71	2.79	2.89	3.62
	SiO_2_pct	29,482	30,289	73.15	3.90	0.05	15.22	45.06	71.83	73.71	75.45	95.09
	SnO_2_pct	35,143	39,776	0.03	0.03	1.20	0.00	0.00	0.01	0.02	0.03	1.16
	Ta_2O_5_pct	36,358	41,779	0.01	0.01	1.05	0.00	0.00	0.01	0.01	0.02	1.14
Low Grade		31,068	37,427									
	Fe_2O_3_pct	28,582	33,458	1.66	2.24	1.35	5.00	0.01	0.62	0.99	1.69	60.71
	Li_2O_pct	27,053	31,433	0.35	0.40	1.16	0.16	0.00	0.14	0.24	0.40	4.40
	MnO_pct	25,226	28,030	0.13	0.17	1.31	0.03	0.00	0.05	0.08	0.15	3.81
	Na_2O_pct	28,663	33,565	4.47	2.40	0.54	5.75	0.00	2.41	4.29	6.45	11.60
	P_2O_5_pct	27,691	32,200	0.54	0.73	1.37	0.54	0.00	0.20	0.30	0.53	10.56
	SG_d	322	283	2.65	0.12	0.04	0.01	2.28	2.60	2.63	2.67	3.79
	SiO_2_pct	25,226	28,030	71.16	7.03	0.10	49.41	18.51	67.70	71.36	75.07	97.39
	SnO_2_pct	29,775	35,214	0.07	0.09	1.34	0.01	0.00	0.02	0.05	0.08	3.53
	Ta_2O_5_pct	30,070	35,662	0.02	0.03	1.03	0.00	0.00	0.01	0.02	0.03	0.59

Source: SRK, 2020
Note: Statistics are length-weighted and reported inside 0.7% Li_2O pegmatite shape, and outside. Intervals may have been split for the purposes of statistical reporting across model domains.

11.2.2 Outliers and Compositing

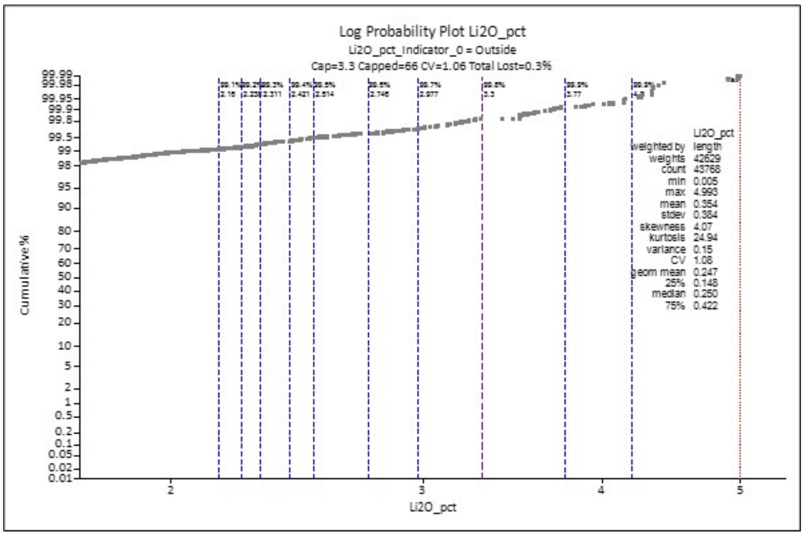
Outlier populations were considered within the Li_2O data only. Outliers in this case are values which dramatically exceed the mean of the population and which may have undue influence on the results of estimation. SRK evaluated the populations of data split between the high and low grade domains utilizing log probability plots and a matrix comparison of multiple potential caps to consider impacts on the coefficient of variation, mean, and total lost grade due to capping. The log probability plots, as shown in Figure 11-9 and Figure 11-10 show stable and consistently increasing populations of grade above the 90th percentile, with breaks in the distribution occurring around 5.4 to 5.6% Li_2O for the higher grade population, and around 3.3% for the lower grade population. To examine the potential impact of these outliers on the overall estimation, SRK reviewed the grade populations at higher limits to determine if there were consistent groupings or clusters of higher grade data which may need sub-domaining and noted that this was not the case. Higher grades at or above these limits are sparse and scattered throughout the deposit (although generally isolated to the larger higher grade core of the deposit). SRK reviewed outlier impact tables for each domain as well, reviewing the impacts to the overall variance and mean metrics, and noted very limited impact to the Li_2O in either case (Table 11-5 and Table 11-6).

SRK selected nominal points of outlier restriction at 5.5% and 3.3% Li_2O for the high and low grade populations respectively. SRK did not “cap” or limit the input dataset prior for estimation, but instead applied outlier restrictions on the estimate itself as described in Section 11.2.



Source: SRK, 2020

Figure 11-9: Log Probability Plot – Li_2O% High Grade Domain



Source: SRK, 2020

Figure 11-10: Log Probability Plot – Li_2O% Low Grade Domain

Table 11-5: Outlier Impact Evaluation – High Grade Domain

Column	Cap	Capped	Percentile	Capped%	Lost		Count	Weight	Min	Max	Mean	Total	Variance	CV
					Total%	CV%								
Li$_2$O_pct							82688	96819	0.023	6.562	2.707	262049	1.62	0.47
Li$_2$O_pct	6.56	0	100%	0%	0%	0%	82688	96819	0.023	6.562	2.707	262049	1.62	0.47
Li$_2$O_pct	6.00	2	100%	0%	0%	0%	82688	96819	0.023	6	2.707	262047	1.62	0.47
Li$_2$O_pct	5.75	9	99.90%	0.01%	0%	0.01%	82688	96819	0.023	5.75	2.707	262045	1.62	0.47
Li$_2$O_pct	5.50	31	99.90%	0.04%	0%	0.02%	82688	96819	0.023	5.5	2.706	262039	1.62	0.47
Li$_2$O_pct	5.40	45	99.80%	0.10%	0.01%	0.02%	82688	96819	0.023	5.4	2.706	262034	1.61	0.47
Li$_2$O_pct	5.14	202	99.70%	0.20%	0.02%	0.07%	82688	96819	0.023	5.138	2.706	261993	1.61	0.47
Li$_2$O_pct	5.02	343	99.50%	0.40%	0.04%	0.10%	82688	96819	0.023	5.023	2.706	261949	1.61	0.47
Li$_2$O_pct	4.96	480	99.30%	0.60%	0.05%	0.20%	82688	96819	0.023	4.957	2.705	261910	1.61	0.47
Li$_2$O_pct	4.91	618	99.10%	0.70%	0.07%	0.20%	82688	96819	0.023	4.905	2.705	261871	1.61	0.47
Li$_2$O_pct	4.83	966	98.60%	1.20%	0.10%	0.30%	82688	96819	0.023	4.833	2.704	261791	1.6	0.47
Li$_2$O_pct	Li$_2$O_pct > 5.5						31	42.6	5.501	6.562	5.727	243.9	0.08	0.05
Li$_2$O_pct	Li$_2$O_pct <= 5.5						82657	96777	0.023	5.497	2.705	261805	1.61	0.47

Note: Red text highlights applied values.
Source: SRK, 2020

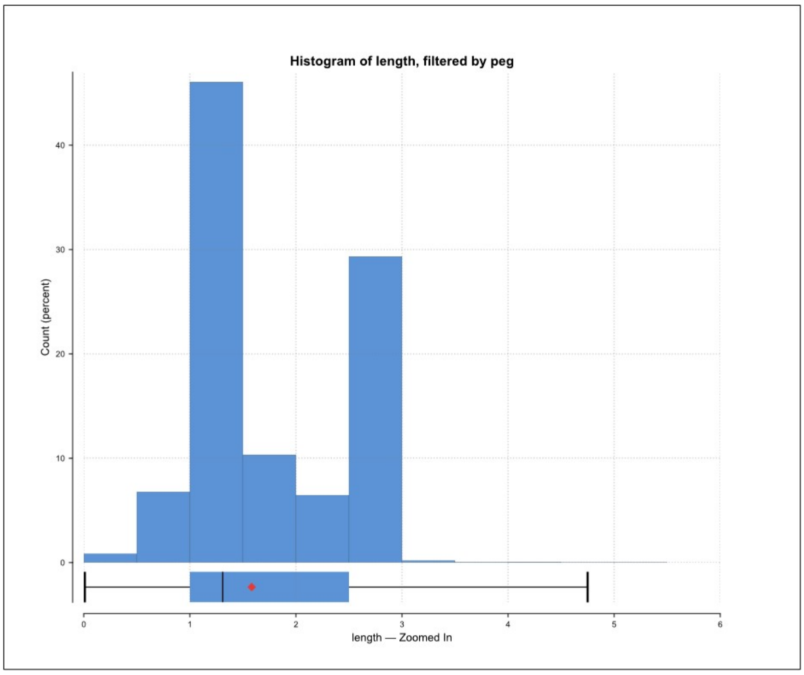
Table 11-6: Outlier Impact Evaluation – Low Grade Domain

Column	Cap	Capped	Percentile	Capped%	Lost		Count	Weight	Min	Max	Mean	Total	Variance	CV
					Total%	CV%								
Li$_2$O_pct							43768	42629	0.005	4.993	0.354	15092	0.15	1.08
Li$_2$O_pct	4.20	17	99.90%	0.04%	0.05%	0.40%	43768	42629	0.005	4.2	0.354	15085	0.15	1.08
Li$_2$O_pct	3.77	32	99.90%	0.10%	0.10%	1.10%	43768	42629	0.005	3.77	0.354	15072	0.14	1.07
Li$_2$O_pct	3.30	66	99.80%	0.20%	0.30%	2.30%	43768	42629	0.005	3.3	0.353	15044	0.14	1.06
Li$_2$O_pct	2.98	115	99.70%	0.30%	0.50%	3.60%	43768	42629	0.005	2.977	0.352	15012	0.14	1.04
Li$_2$O_pct	2.75	166	99.60%	0.40%	0.80%	4.90%	43768	42629	0.005	2.746	0.351	14977	0.13	1.03
Li$_2$O_pct	2.51	217	99.50%	0.50%	1.10%	6.30%	43768	42629	0.005	2.514	0.35	14933	0.13	1.02
Li$_2$O_pct	2.42	260	99.40%	0.60%	1.20%	7%	43768	42629	0.005	2.421	0.35	14911	0.12	1.01
Li$_2$O_pct	2.31	304	99.30%	0.70%	1.40%	7.80%	43768	42629	0.005	2.311	0.349	14882	0.12	1
Li$_2$O_pct	2.24	352	99.20%	0.80%	1.50%	8.50%	43768	42629	0.005	2.238	0.349	14858	0.12	0.99
Li$_2$O_pct	2.16	410	99.10%	0.90%	1.70%	9.30%	43768	42629	0.005	2.16	0.348	14829	0.12	0.98
Li$_2$O_pct	Li$_2$O_pct >3.3						66	74.95	3.405	4.993	3.938	295.1	0.21	0.12
Li$_2$O_pct	Li$_2$O_pct <=3.3						43702	42554	0.005	3.291	0.348	14797	0.12	1.01

Note: Red text highlights applied values.
Source: SRK, 2020

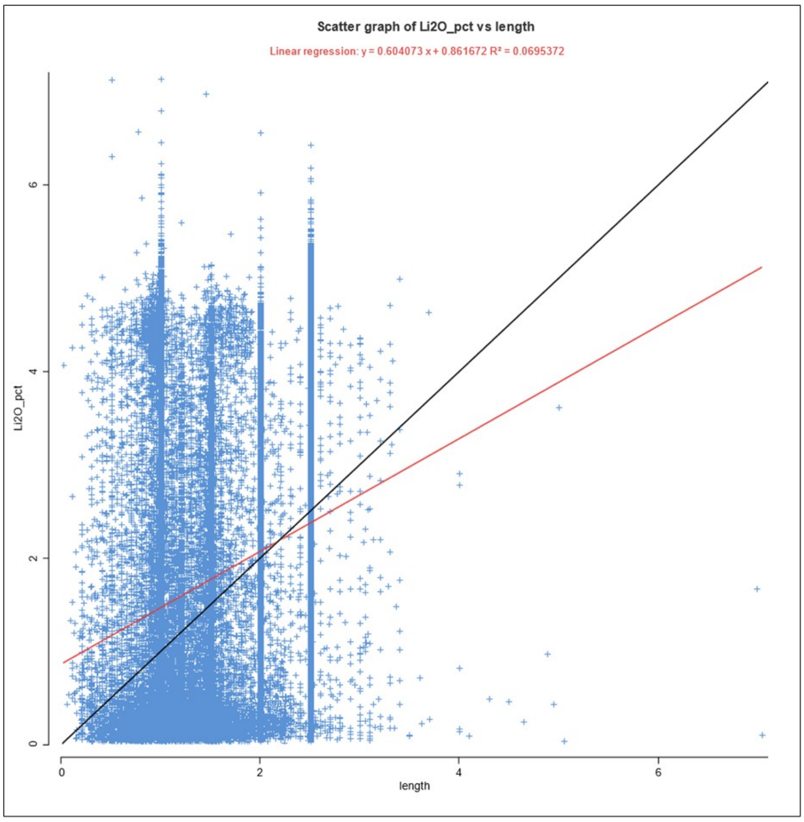
Drilled sample length within the pegmatites was considered for the purposes of understanding the variability of the sample size. Nominally, samples have been collected at 1.5 m intervals for the majority (46.5%) of exploration and development drilling. A comparatively smaller set of samples were collected at intervals between 2.5 m and 3 m (about 30%), with the remaining percentages of samples collected at lengths between or below these populations. Very few samples are taken at lengths longer than 3 m. The histogram distribution of samples within the pegmatite is shown in Figure 11-11. In addition to the distribution of the sample lengths, SRK reviewed the overall relationship between the Li_2O grades and the sample length and noted no bias which would insinuate nominally higher grades associated with shorter samples (Figure 11-12).

In order to make the sample support more consistent for the purposes of estimation, as well as to begin scaling up the sample size to approximate a mining unit, SRK elected to composite the drilling to a length of 3 m. A comparison of the distribution of Li_2O% in original samples vs. composited data is shown in Figure 11-13. In general, compositing results in a reduction of the overall sample population from 112,336 samples to 57,603 composites, with an incremental decrease in the CV from 0.92 to 0.88.



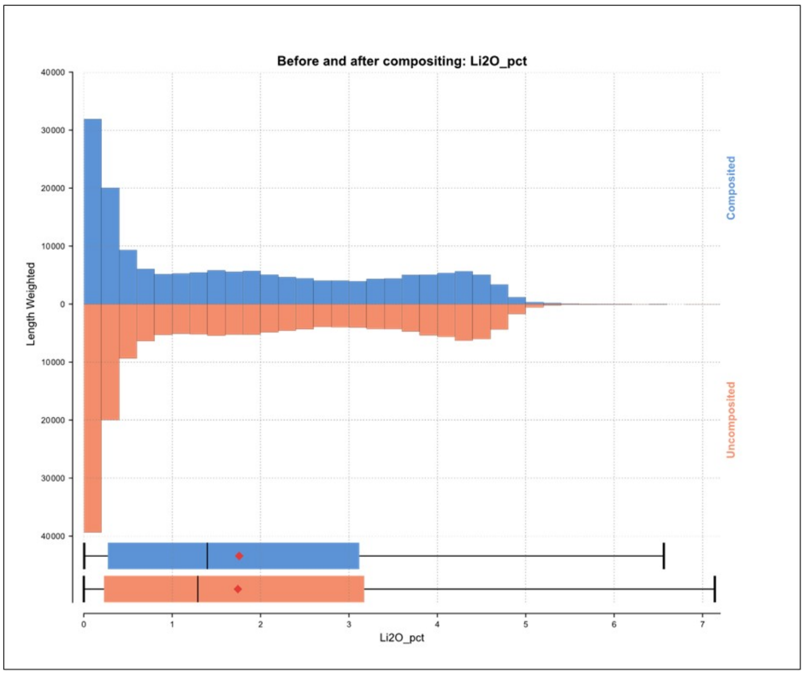
Source: SRK,2020

Figure 11-11: Histogram of Sample Length within Pegmatite



Source: SRK, 2020

Figure 11-12: Scatter Plot Li_2O% and Sample Length



Source: SRK,2020

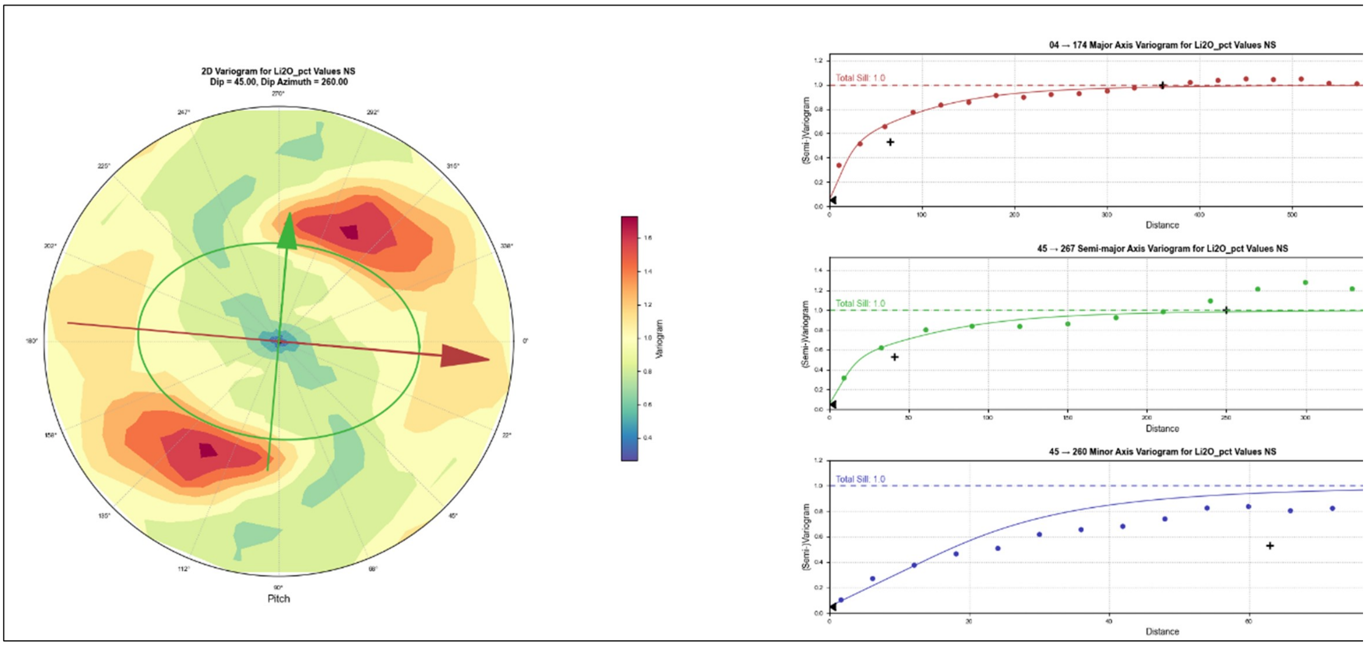
Figure 11-13: Compositing Comparisons – Li_2O%

11.2.3 Continuity Analysis

SRK conducted continuity analysis of the Li_2O grades within the separate resource domains. Although other elements were estimated and utilized geostatistical estimators, only Li_2O is relevant for the long-term mineral resource reporting and will be described herein. Other elements which are estimated are utilized for internal conceptual materials typing and are not considered for resource reporting in any way. Continuity analysis was done through the use of conventional semi variogram calculation using a normal scores transform of the input data and was generated in Snowden Supervisor software for import and review to Leapfrog EDGE. Input data was the 3 m composited drilling data within each relative domain. Orientations were determined based on 3D visualization of the trends of mineralization along with variogram maps showing relative orientations of “best” continuity. Variograms were back-transformed from the normal scores for use in Leapfrog EDGE for estimation purposes.

High Grade Domain

The high-grade domain featured robust variography, with very low nugget effects modeled using the down-hole variogram, and stable experimental variograms out to ranges of 250 to 360 m in the semi-major and major directions respectively. Given the relatively tabular nature of the pegmatite, the minor variogram range is considerably shorter, with a range of about 80 m. This defines an ellipsoid which is generally flattened and oriented along the strike and down dip of the overall pegmatite domain. Individual variograms for the high-grade domain are shown in Figure 11-14.

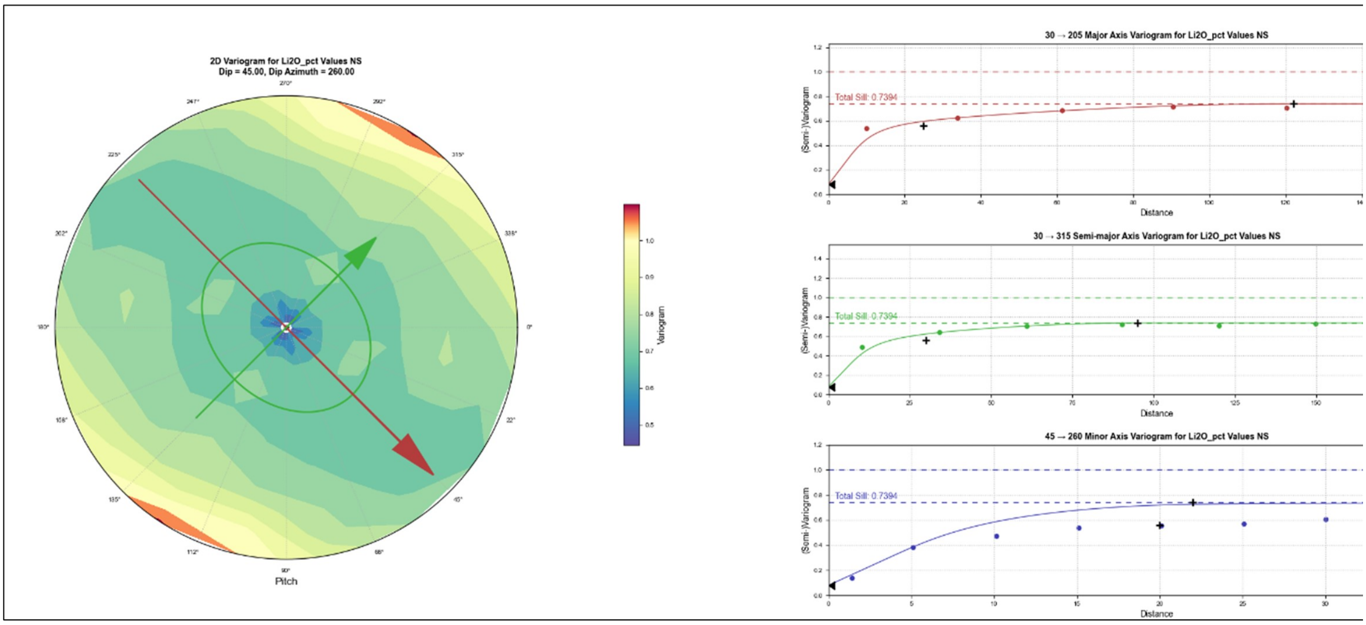


Source: SRK, 2020

Figure 11-14: Modeled Variograms – Li_2O% - High Grade Domain

Low Grade Domain

As would be expected, the lower grade domain featured comparably less robust variography. Very low nugget effects modeled using the down-hole variogram, and stable experimental variograms out to ranges of 90 to 125 m in the semi-major and major directions respectively. Given the relatively tabular nature of the pegmatite, the minor variogram range is considerably shorter, with a range of about 20 to 25 m. This defines an ellipsoid which is very flat and oriented along the strike and down dip of the overall pegmatite domain. In general, the Individual variograms for the high grade domain are shown in Figure 11-15. In general, SRK notes that the continuity analysis for both domains is reasonable and is consistent with the geological orientations and expectations of continuity. Variogram outputs for the two domains as utilized in the kriging estimators in EDGE are summarized in Table 11-7.



Source: SRK,2020

Figure 11-15: Modeled Variograms – Li_2O% - Low Grade Domain

Table 11-7: Li$_2$O Variogram Models

General	Direction						Structure 1						Structure 2					
Variogram Name		**Dip**	**Dip Azimuth**	**Pitch**	**Model Space**	**Variance**	**Nugget**	**Sill**	**Structure**	**Alpha**	**Major**	**Semi-Major**	**Minor**	**Sill**	**Structure**	**Alpha**	**Major**	**Semi-Major**
Li$_2$O_pct HG: Transformed Variogram Model Li$_2$O HG	45	260	5	Normal score	1	0.05	0.48	Spheroidal	3	66	41	63	0.47	Spheroidal	3	360	250	85
Li$_2$O_pct LG: Transformed Variogram Model Li$_2$O LG	45	260	45	Normal score	1	0.08	0.4794	Spheroidal	3	25	30	20	0.18	Spherical		122.1	95	22

Source: SRK,2020

11.3 Mineral Resources Estimates

The geological model and block model discussed herein remains based on information which has not materially changed since disclosure on June 30, 2020. SRK notes that very limited additional drilling has been added to Central Lode in the subsequent 12 months, and as of the effective date of June 30, 2021, no update to the MRE was conducted due to lack of material change. SRK was provided with the additional drilling information and, based on review of the likely changes to the global mineral resource statement, noted changes less than 0.5% to tonnes and Li_2O grades assuming the same processes discussed herein updated with the additional data. As of the effective date of this report, the nearby Kapanga deposit has not been incorporated into this mineral resource estimate, as data collection and technical work supporting disclosure of this area was still in progress.

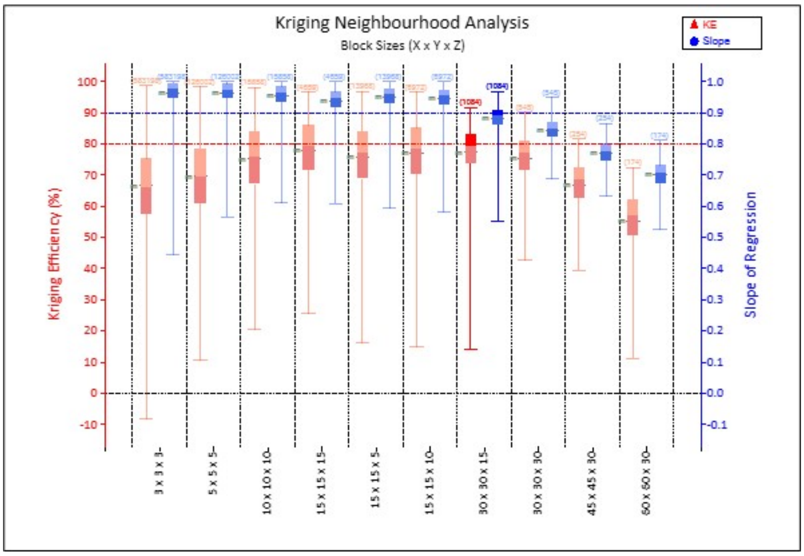
The mineral resource statement based on this model has been updated to reflect revised pit optimization parameters for the June 30, 2021 effective date. These may reflect adjustments in economics, pit slope angles, or other factors which have not modified the June 30, 2020 input data such as drilling, geology models, or block models.

The MRE was completed using Leapfrog EDGE, although inputs and analysis may have been conducted in other software such as Snowden Supervisor or Phinar X10 Geo. SRK notes that there is an extensive history of MREs, mineral reserve estimates, and production at Greenbushes, and that the SRK estimate is considered in that context.

11.3.1 Quanitative Kriging Neighborhood Analysis (QKNA)

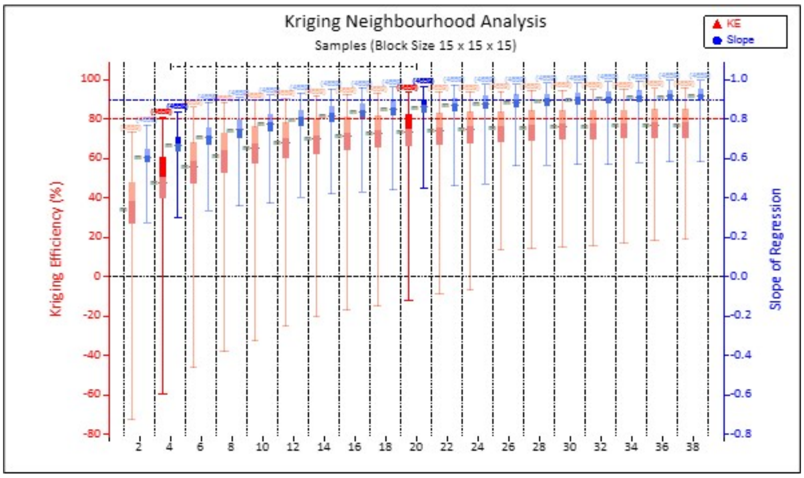
QKNA was utilized to assess potential impacts and sensitivity of estimation parameters such as block size, sample selection, and search distances. While QKNA is not the definitive measure of what parameters must be, it is a useful data point in gauging the potential sensitivity of the estimation to these parameters. In general, QKNA evaluates the impact of varying aforementioned parameters, but bases the sensitivity on outputs to the kriging efficiency (KE) and slope of regression (SoR) averages for the estimate. KE and SoR are commonly referred to as measures of the relative quality of the estimate and are dependent on the input variogram. SRK evaluated the impacts to the KE and SoR for multiple scenarios evaluating block size, sample selection, and search range as shown in Figure 11-16, Figure 11-17, and Figure 11-18 respectively.

In general, SRK notes that the QKNA suggests an optimum block size (of those tested) of 15 x 15 x 15 m, sample selection criteria of between 4 and 20 samples, and effectively a negligible impact to estimation quality based on the search ranges tested. Search ranges considered were done in +/-25% increments oscillating around a base case of the high-grade total variogram range.



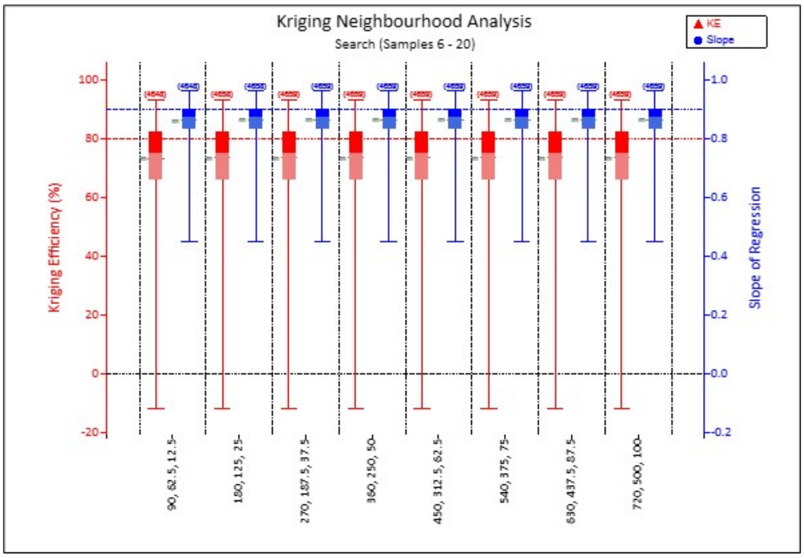
Source: SRK,2020

Figure 11-16: QKNA Block Size Sensitivity



Source: SRK,2020

Figure 11-17: QKNA Sample Selection Sensitivity

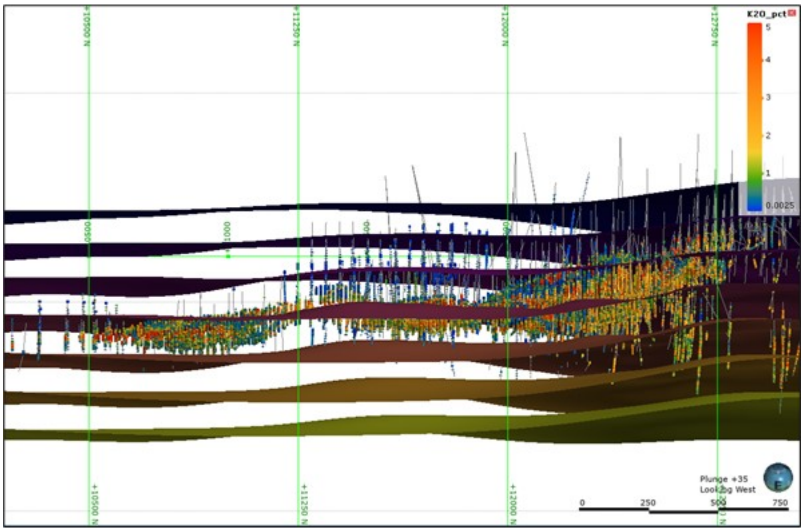


Source: SRK,2020

Figure 11-18: QKNA Search Range Sensitivity

11.3.2 Variable Orientation Modeling

Despite the need to calculate and model continuity analysis using variograms, which are oriented in a specific direction, it is clear from geological modeling and previous mining that the pegmatite anastomoses and shifts orientation at local scales. To incorporate this geological variance into the estimation (thereby producing a more accurate estimate) SRK incorporated a number of geological features from the 3D model into a variable orientation model. This effectively calculates an orientation to be used for estimation searches from the input wireframes. Wireframes in this case are based on the interpolated structural data for overall pegmatite trends, as shown in Figure 11-19. Outputs from this process are individual search orientations for each block based on the relative proximity of the block itself to the surfaces. Blocks which are external to the modeled surfaces take on the overall variogram orientation from continuity analysis. The kriging ellipse is also re-oriented for blocks based on the variable orientation model.

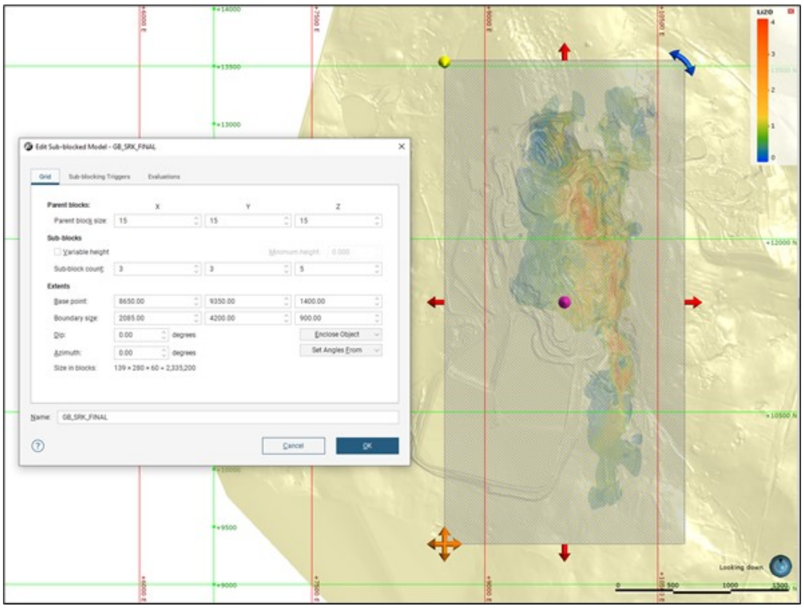


Source: SRK, 2020

Figure 11-19: Structural Planes Utilized for Variable Orientation Modeling

11.3.3 Block Model

SRK created a block model for interpolation purposes in Leapfrog EDGE. As shown in Figure 11-20, the block model encompasses the geological model for the pegmatite, as well as the current pit area. The model is sub-blocked, with parent cells at a 15 by 15 by 15 m block divided into 5 by 5 by 3 m blocks along geological or topographic (pit) boundaries. Detailed parameters for the block model are summarized in Table 11-8. The block model was exported to csv and imported to Vulcan (bmf) format for mine planning and pit optimization work.



Parent blocks:

	X	Y	Z
Parent block size:	15	15	15

Sub-blocks

☐ Variable height Minimum height: 0.000

	X	Y	Z
Sub-block count:	3	3	5

Extents

	X	Y	Z
Base point:	8650.00	9350.00	1400.00
Boundary size:	2085.00	4200.00	900.00

Dip: 0.00 degrees

Azimuth: 0.00 degrees

Size in blocks: 139 × 280 × 60 = 2,335,200

Name: GB_SRK_FINAL

Source: SRK, 2020

Figure 11-20: Block Model Extents/Parameters

Table 11-8: Block Model Details

Base point:	8650, 9350, 1400
Parent block size:	15 × 15 × 15
Dip:	0°
Azimuth:	0°
Boundary size:	2085 × 4200 × 900
Sub-blocking:	3 × 3 × 5
Total blocks:	11,692,460
Number of parent blocks:	139 × 280 × 60 = 2,335,200
Number split:	212,665 (9.1%)
Number of sub-blocks:	9,569,925
Minimum sub-block height:	3
Bounding Box:	
Minimum:	8650, 9350, 500
Maximum:	1.074e+04, 1.355e+04, 1400
Sub-blocking is triggered by:	
Greenbushes_SRK_IS	Volume boundaries
Reporting_010720 Pits	Volume boundaries

Source: SRK, 2020

11.3.4 Grade Interpolation

Grades were interpolated from the composited drilling data for Li_2O using Leapfrog EDGE. A nested two-pass estimation was designed to accomplish estimation in a first pass from more sampling, at higher data densities, with more restrictions on estimation methodology in the initial passes. Ordinary kriging (OK) was utilized for interpolation of grade. Estimation parameters are based on overall Li_2O variogram ranges within the high grade domain, with ranges in the first pass being approximately 50% of the total range (about 80% of the variance) and the second pass being the full range of the variogram. Other estimation parameters were selected based on initial assessments of the QKNA results and were refined based on iterative reviews of the visual, statistical, and reconciliation validation efforts.

Orientations for searches are variable using the variable orientation modeling parameters as noted in Section 11.3.2. Outliers are dealt with through the use of the “clamping” modifier in EDGE. This limits the extent to which an outlier grade is utilized over a smaller range than the actual search (defined as a percentage of the ellipsoid ranges). SRK utilized a 5.5% Li_2O and 3.3%Li_2O threshold over 5% of the search distance for each pass. SRK also utilized sector limitations (quadrants) for the first pass of estimation to ensure that data was pulled from multiple locations rather than clustered from groups of closely-spaced data. To further ensure this, a restriction of a maximum of two samples per hole was utilized. This, combined with the five sample minimum for the first pass, resulted in the first estimation pass using no fewer than three drillholes. The second estimation pass significantly reduces the overall restrictions by expanding the search, reducing the overall minimum of samples, and eliminating the sector requirements.

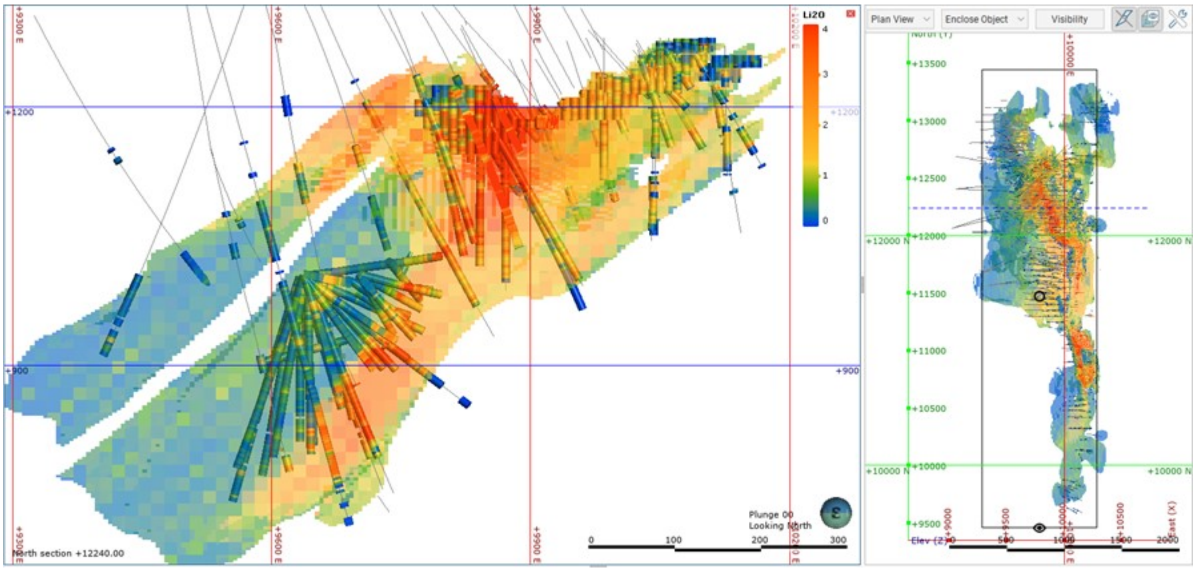
Table 11-9: Li_2O Estimation Parameters

General			Ellipsoid Ranges (m)			Variable Orientation	Number of Samples		Outlier Restrictions			Sector Search			Drillhole Limit, Max Samples per Hole
Name	Domain	Values	Maximum	Intermediate	Minimum		Minimum	Maximum	Method	Distance	Threshold	Method	Max Samples	Max Empty Sectors	
Kr, Li_2O_pct HG P1 RDEX	Li_2O_pct Indicator 0.7 100 0.50: Inside	Li_2O_pct	180	150	25	VO_Li_PEG	5	15	Clamp	5	5.55	Quadrant	5	1	2
Kr, Li_2O_pct HG P2 RDEX	Li_2O_pct Indicator 0.7 100 0.50: Inside	Li_2O_pct	360	250	50	VO_Li_PEG	1	15	Clamp	2.5	5.55				2
Kr, Li_2O_pct LG P1 RDEX	Li_2O_pct Indicator 0.7 100 0.50: Outside	Li_2O_pct	180	125	25	VO_Li_PEG	5	15	Clamp	5	3.3	Quadrant	5	1	2
Kr, Li_2O_pct LG P2 RDEX	Li_2O_pct Indicator 0.7 100 0.50: Outside	Li_2O_pct	360	250	50	VO_Li_PEG	1	15	Clamp	2.5	3.3				2

Source: SRK, 2020

11.3.5 Validation

The interpolation of grade was validated through a series of checks on the visual and statistical distribution of grades compared to the input composite data. Visual grade distribution on section and level plans was reviewed carefully across the entire estimate to ensure that grades compared well to composite date and that the geological trends were being honored. An example of this comparison is shown in Figure 11-21. Statistical comparison of the individual domain estimates to the input composite data shows excellent agreement globally (Table 11-10 and Table 11-11). To evaluate a localized statistical comparison, SRK produced swath plots. These plots evaluate the means of blocks and composites along swaths or slices through the model oriented along the NS, EW, and elevation axes. In general, these plots show excellent local agreement of the composites and blocks along slices, an example of which is shown in Figure 11-22. These plots were created for each axis in each domain.



Source: SRK, 2020

Figure 11-21: Visual Comparison of Li_2O Distribution

Table 11-10: Statistical Comparison Li_2O% – High Grade Domain

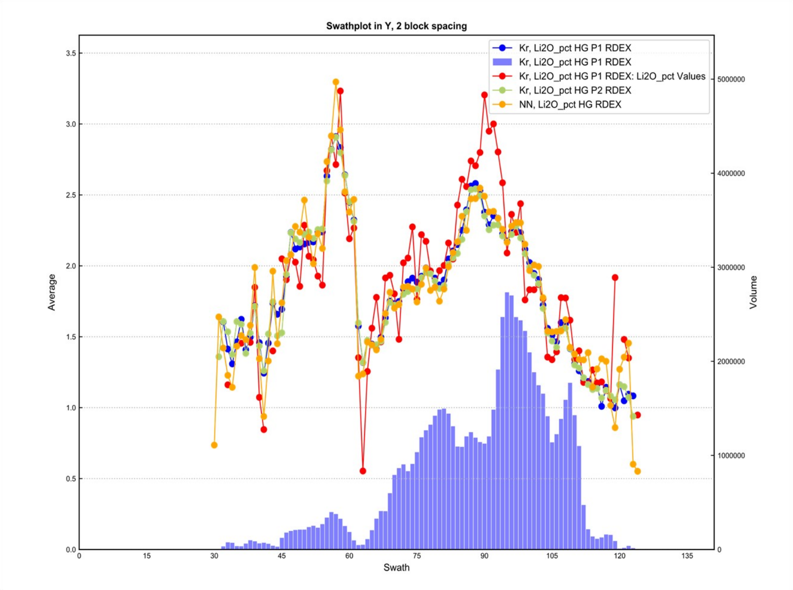
	Composites	Blocks
Count	50,937	425,803
Length	46,649	71,063,325
Mean	2.09	1.99
SD	1.26	0.85
CV	0.60	0.43
Variance	1.59	0.73
Minimum	0.02	0.14
Q1	1.08	1.34
Q2	1.90	1.83
Q3	3.04	2.53
Maximum	6.56	4.89

Source: SRK, 2020

Table 11-11: Statistical Comparison Li_2O% – Low Grade Domain

	Composites	Blocks
Count	43,267	276,735
Length	38,180	55,880,325
Mean	0.55	0.45
SD	0.65	0.33
CV	1.18	0.72
Variance	0.42	0.11
Minimum	0.01	0.03
Q1	0.18	0.23
Q2	0.30	0.35
Q3	0.62	0.58
Maximum	4.94	2.97

Source: SRK, 2020



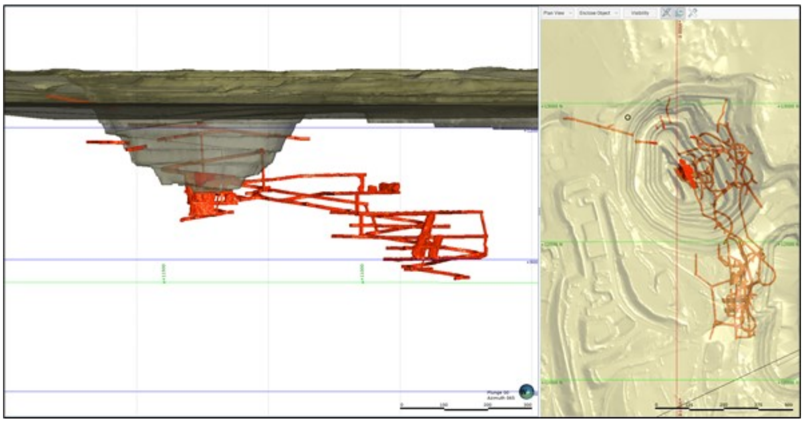
Source: SRK, 2020

Figure 11-22: Swath Plot – Li_2O% – High Grade Domain

11.3.6 Depletion

The SRK block model is limited at surface by a 2008 topographic survey. SRK chose to estimate blocks above the current June 30, 2020 topography in order to better assess the accuracy of the estimate through reconciling to previous production periods. Additional models were developed for use in reconciliation and reporting. They included a depletion model built around available end-of-year mined topography surfaces from 2008 through 2020. The differences between annual mining surfaces were used to generate volumes for depleting the model to the end of June 2020 production period.

In addition to the open-pit depletion, SRK used surveyed underground voids from the previous tantalum mining operation at depth in the C3 area to deplete density in the model. This was done via a 1 m distance buffer around a combined void wireframe to account for potential inaccuracy in the survey of the wireframes, and due to closure/consistency issues in the survey wireframes themselves. This underground depletion affects density assignment in blocks for both the mineral resource and the mineral reserve, although overall impacts are minimal.



Source: SRK, 2020
Shown are June 30, 2020 mine topography (yellow) and 1m distance buffer around underground mining/development (red).

Figure 11-23: Depletion Surfaces/Volumes

11.3.7 Bulk Density

SRK was provided with specific gravity data (SG) from 2,074 samples taken from Pegmatite, Amphibolite, Granofels, and Dolerite rock types. Descriptive statistics for the SG from these rock types is shown in Table 11-12. To assign bulk density to the block model, mean SG was coded into the waste rocks based on the data provided. Alluvial and fill material were assigned a nominal density of 1.8 g/cm^3 and 1.5 g/cm^3 based on reasonable average densities for these unconsolidated material types. For the pegmatite, Talison has previously utilized a regression analysis of the Li_2O content to accurately calculate bulk density. This is developed from the pegmatite SG sampling and the extensive production history of the mine. The calculation of density for pegmatite is shown below:

*Density (Pegmatite) = 0.071 * (Li_2O) + 2.59*

Bulk densities were assigned those values as shown in Table 11-12. SRK considers the assignment of mean densities of the waste rocks reasonable, and the determination of the regression analysis for the Li_2O/SG relationship appropriate given its reliable use in production tracking and reporting as stated by Talison. All bulk densities are assumed to relate equally to SG for this study, with assumption of negligible moisture content in the hard rock at the time of blasting and mining.

Table 11-12: SG Data by Rock Type – Bulk Density Assignment

	Model Bulk Density (g/cm³)	Count	Length	Mean SG	Standard Deviation	Coefficient of Variation	Variance	Minimum	Maximum
Rock Type		2074	1,819.44	2.81	0.17	0.06	0.03	1.59	3.98
A	3.03	254	206.97	3.03	0.13	0.04	0.02	2.38	3.98
D	2.98	198	149.31	2.98	0.15	0.05	0.02	2.53	3.71
G	2.93	91	73.32	2.93	0.17	0.06	0.03	2.60	3.17
P	Variable	1528	1,387.20	2.76	0.14	0.05	0.02	1.59	3.79
Alluvial	1.8	NA							
Fill	1.5	NA							

Source: SRK, 2020

The June 30 stockpile tonnes are the surveyed volume by the bulk density adjusted from survey date and time up to 30th June with crusher weightometer throughput (tonnes) and truck movements and distribution of oversize which is allocated an average bulk density of 1.8 g/cm^3. Bulk densities are actually a range within the stockpiles of between 1.6 and 2.2 g/cm^3.

11.3.8 Reconciliation

As a final validation, SRK compared the tonnes and grades estimated in this model to annual production from the 2017, 2018, and 2019 periods. Talison produces annual end of year pit surfaces which were used to flag the production periods in the block model and compare against the documented production from those periods. This comparison is generally dependent on the quality of the reconciliation done by site, and can be influenced by materials handling, stockpile movement, and operational challenges which locally may make the comparisons difficult. Talison noted instances where reconciliation to production was made difficult due to these types of factors.

SRK reviewed the reconciliation for the trucked material and utilized this as the comparison data set. In this type of reconciliation, the grades are assigned based on the very close-spaced blast holes, with tonnage developed from truck counts from the mined area. Compared to the mill reconciliation, which considers additional stockpile material being fed into the plant at various times, SRK is of the opinion that the trucked reconciliation data is the best representation of the material physically removed over the production periods. This comparison was used for iterative review of the resource model in combination with the previously mentioned validation checks and drove the parameters for estimation to bring the ranges relatively closer. Final comparisons of the SRK model to the mined tonnage over the production periods is summarized in Table 11-13. SRK noted very reasonable performance of the current mineral resource estimation against the reconciled production periods.

Table 11-13: Model – Mined Reconciliation Results

	Tonnes	Grade
Model - 2017 Period	1,669,973	2.88
2017 Reconciled Mining	1,628,678	2.79
2017 Comparison	98%	107%
Model - 2018 Period	2,167,546	2.86
2018 Reconciled Mining	2,101,191	2.77
2018 Comparison	97%	97%
Model - 2019 Period	2,722,671	2.80
2019 Reconciled Mining	2,505,984	2.83
2019 Comparison	92%	101%

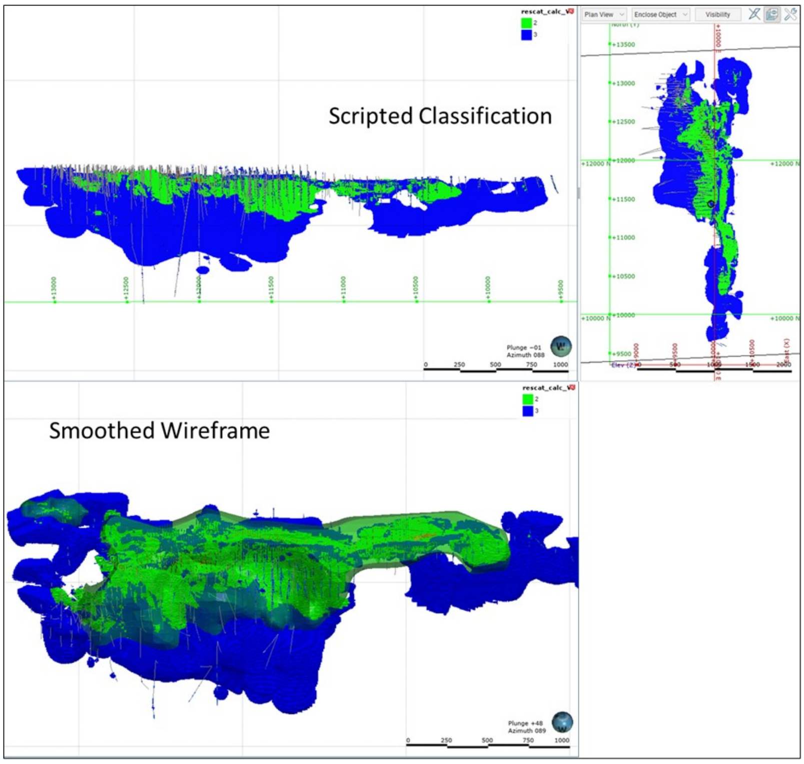
Source: SRK/Talison, 2020

11.3.9 Resource Classification and Criteria

SRK has made all reasonable efforts to model the geological complexity and estimate the mineral resources at a high level of detail, but the uncertainty with these factors and how they affect the mining and processing of pegmatites is known to be best assessed at the grade-control scale of modeling. The mineral resources at the global scale are stated as Indicated and Inferred categories to convey the confidence in the geological continuity and grade consistency in the pegmatite.

To assess this relative confidence, SRK considered a number of factors in the classification scheme. SRK considered the number of drill holes used in the estimate, the average distances to the informing composites, and the slope of regression (SoR) as a measure of relative accuracy of the estimate as inputs to a script-based classification of the resource. SoR ranges were considered based on histogram reviews of the SoR within the relevant domains, visual reviews of SoR consistency in the estimated domain, and iterative processing of the script to best coalesce the higher confidence blocks around higher densities of drilling and more robust grade continuity. This script was run on a block-by-block basis, with results reviewed against the drilling and modeling to assess how well it characterized confidence in the estimate. Subsequent to this, SRK digitized polylines and generated smoothed classification wirefames which dealt with edge effects and artifacts noted in the scripted classification. The general criteria for defining Indicated in the script is shown below. A graphical example of this process is shown in Figure 11-24. All resources estimated within the pegmatite which were not categorized as Indicated were assigned an Inferred category.

- Indicated resources
  - High Grade Domain
    - >=Three Drillholes
    - Average Distance of <= 180 m
    - SoR >= 0.5
  - Low Grade Domain
    - >=Three Drillholes
    - Average Distance of <= 40 m
    - SoR >= 0.2



Source: SRK, 2020

Figure 11-24: Classification Process

11.4 Cut-Off Grades Estimates

The cut-off grade determination is based on assumptions and actual performance of the Greenbushes operation. Concentrate attributes and production cost inputs to the cut-off calculation are presented in in Table 11-14. Recovery of a 6% Li_2O concentrate is based on the previously noted weight recovery calculations from actual operational data.

Pricing was assumed based on a review of historic price trends for the assumed product (spodumene concentrate), taking into account a strategy of utilizing a higher resource price than would be used for a reserve estimate. This pricing was discussed with Albemarle and is consistent with resource pricing scenarios developed for other spodumene concentrate operations. Mineral resources were estimated based on a spodumene concentrate sales price of US$750/t of concentrate CIF China (or US$672/t of concentrate at the mine gate after deducting transportation costs and government royalty).

Considering these costs, recovery and pricing scenarios, SRK derived a resource CoG of 0.573% Li_2O. A nominal CoG of at least 0.5% has been assumed for the stockpile material, although SRK notes it is generally used to augment other material types for processing during active mining.

Table 11-14: Cut-Off Grade Calculation for Resources

Revenue	**Units**	**Value**
Cut-Off Grade	Li_2O%	0.573
Mass Yield	t of 6% Li_2O Concentrate	0.045
Price at Mine Gate	US$/t of 6% Li_2O Concentrate	671.69
Total Revenue	US$/t-RoM	30.19
Costs		
Incremental Ore Mining	US$/t-RoM	4.75
Processing	US$/t-RoM	17.87
G&A	US$/t-RoM	4.91
Sustaining Capital	US$/t-RoM	2.66
Total Cost	**US$/t-RoM**	**30.19**

Notes:
- Mass yield is based on Greenbushes' mass yield formula and varies by plant. The CGP1 LoM average of 29.49% but is subject to a 97% recovery limitation when the lithium oxide grade exceeds 5.5%. Mass yield varies as a function of grade, and may be reported herein at lower mass yields than the CGP1 average.
- Incremental ore mining costs include RoM loader, rehandle from long-term stockpiles, grade control assays, and rock breaker.

Source: SRK, 2021

11.5 Reasonable Potential for Eventual Economic Extraction (RPEEE)

SRK constrained the statement of mineral resources to within an optimized pit shell produced in Maptek Vulcan using the internal LG algorithm calculations. The optimized pit is designed to consider the ability of the "ore" tonnes to pay for the "waste" tonnes based on the input economics. The result is a surface or volume which constrains the resource but provides the RPEEE at the resource pricing revenue factor while utilizing the current reserve pricing for overall inputs. Pit optimization inputs are noted as follows:

- Reserve based 6% Li_2O concentrate price of US$577/t (mine gate)
- Revenue Factor of 1.30 = US$759/t Li_2O concentrate pricing (mine gate)
  - 30% premium to reserve price and comparable with US$672/t resource price (mine gate).
- CGP1 weight recovery (mass yield) is based on Greenbushes' mass yield formula with a LoM mass yield assumption of 29.49%. Mass yield varies as a function of grade, and may be reported herein at lower mass yields than the CGP1 average.
- Pit slope (50 degrees on the west wall and 39 degrees on the east wall)
- 0% mining dilution, 100% mining recovery
- US$ 4.75/t mining cost, US$ 17.87/t processing cost, US$ 4.91/t G&A cost, and US$ 2.66/t sustaining capital cost.

The resource pit is then used as a reporting limit to exclude all tonnes from reporting which sit external to this pit shape. SRK notes that the mineral reserve (Section 12) is constrained by a reserve pit. This reserve pit generally sits within the resource pit, although it locally extends beyond the limits of the resource pit due to design constraints such as ramps. SRK also notes that the optimized pit for resource reporting is not limited by boundaries for mining infrastructure, and that no capital costs for movement or replacement of this infrastructure are assumed.

The mineral resource estimate also includes stockpile material which has been previously mined at CoG's between 0.5 and 0.7% Li_2O and which are variable in Li_2O grades or characteristics. This material is crushed and stored at surface, handled by shovels and trucks, and integrated into the materials stream for production purposes based on operational requirements.

11.6 Uncertainty

As a baseline consideration for uncertainty and how it is discussed in this report, SRK notes that Greenbushes is an operating mine with a long history and extensive experience with the exploration, definition, and conversion of mineral resources to reserves which have been mined profitably. SRK has assessed the relative uncertainty in the estimation of mineral resources for Greenbushes in a number of ways, chief of which is the use of mineral resource classification.

SRK considered a number of factors of uncertainty in the classification of the MRE. Most importantly, no Measured resources are stated despite the long production history and extensive detailed drilling/mapping. The overall long-term resources for Greenbushes do not satisfy the requirement to support detailed mine planning and “final” evaluation of the economic viability of the deposit. Further, again despite the long production history, mineralization appropriate for feed to the technical grade plant is not quantified. Reasons for this are as follows:

- The geological and inherent local variability of grade within the pegmatite body is highly variable in areas, and difficult to characterize to a Measured degree of certainty for a global mineral resource.
- The potential for dolerite dikes or blocks of waste rock to be incorporated into the pegmatite, and for these small-scale features which are not as well-modeled at the global scale to significantly contaminate the pegmatite (Fe_2O_3).
- Lack of long-term confidence in the definition of mineralization appropriate to produce higher value products such as technical grade concentrates. Greenbushes consistently produces technical grade concentrates, which, on average, sell at a higher price than chemical grade concentrate and features a separate recovery facility. However, the detail needed to define this material typically happens at the mining blast hole scale and is thus not reported in the long-term resource estimation.
- At present there is a lack of a detailed structural model incorporating brittle structures into the geological model. Although these are not noted to be significant in terms of resource constraints, offsets, or controls, they are likely material to the geotechnical parameters used for pit design and should be modeled.

These geological factors are relevant to the overall confidence in the distribution of the pegmatites as well as the grade continuity internal to them, and do not satisfy the definition of Measured resources at a long-term scale as reported herein. Greenbushes accounts for this variability operationally through detailed grade control drilling in near-term production areas, logging and sampling of blast holes for integration into short range planning, selective mining of the orebody, and ore-sorting at the crusher to limit inputs from waste rock.

Indicated resources are those which are defined at a sufficient level of confidence to assume geological and grade continuity between points of observation. SRK notes that this characterizes the majority of the detailed drilling/sampling at Greenbushes, and that the modeling effort has been designed to incorporate all relevant geological information which supports these assumptions Confidence assumptions built into the designation of Indicated mineral resources are based on geological consistency as noted through cross section and level plan view reviews, 3D observations of the modeling, similarity in drilling characteristics and thicknesses, and estimation quality metrics.

Uncertainty regarding lack of evidence for geological or grade continuity at the levels of the Indicated mineral resources is dealt with by categorizing this material as Inferred. In general, this typically suggests lack of continuity from at least two drillholes, very deep extents of mineralization, very high internal variance of Li_2O grades (as determined through estimation quality metrics), or other factors. In short, there is sufficient evidence to imply geological or grade continuity for this material, but insufficient to verify this continuity. Inferred resources do not convert to mineral reserves during the reserve estimation process and are treated as waste.

Economic uncertainty associated with the resources is mitigated to a large degree by the nature of the Greenbushes mine functioning for many years, as well as the reasonable application of both a pit optimization and CoG assumptions for reporting. As a part of this resource statement, SRK has not considered all potentially relevant factors to uncertainty with the development of the open pit mining operation, including changes to geotechnical parameters, hydrogeological parameters, infrastructure movement, However, SRK has provided sensitivity tables and graphs for the mineral resources in the next section.

11.7 Summary Mineral Resources

SRK has reported the mineral resources for Greenbushes in multiple formats to demonstrate sensitivity to reporting criteria and clarify sources of material. The tables below are not aggregate, and each is an independent perspective on the resources. The Greenbushes resources are stated generally as in-situ (hard rock within an economic pit shell) and stockpile (blasted and mined, stored at surface as crushed material).

- Mineral Resources Exclusive of Reserves. Table 11-15 shows the mineral resources exclusive of reserves. Resource Pit material is contained within the resource pit shell but is external to the designed reserve pit. The Reserve Pit material includes that material which reports within the designed reserve pit, but which does not meet the reserve cut-off, or that material within the reserve pit which is Inferred. The stockpile material which is Measured or Indicated has reported to the reserves, and so the only stockpile material contributing to this resource is taken from the Inferred category.
- In-situ Mineral Resources Inclusive of Reserves. Table 11-16 shows the mineral resources inclusive of the mineral reserve and is comparable to previous reporting standards such as NI 43-101 and the JORC code. This includes all un-mined material which sits in either the resource pit or the reserve pit. As shown in Table 11-16, the majority of the resource is converted to reserve.
- Stockpile Mineral Resources Inclusive of Reserves. Table 11-17 shows the mineral resource contained within stockpiles, reported inclusive of the reserve stockpiles. Effectively, this

includes the Measured and Indicated stockpiles in addition to the Inferred stockpiles included in Table 11-15.

SRK notes that this is not a multiple commodity resource. The only relevant commodity of interest for the current operation is Li_2O in the form of spodumene concentrate. Although, other elements have been estimated for the purposes of downstream materials typing or characterization, in the opinion of the QP, none are considered deleterious to the point of exclusion from the mineral resources, and none are considered to be a co-product or by product with economic value for the purposes of reporting.

Table 11-15: Greenbushes Summary Mineral Resources Exclusive of Mineral Reserves as of June 30, 2021 Based on US$672/t of Concentrate at Mine Gate– SRK Consulting (U.S.), Inc.

Area	Category	100% Tonnes (Mt)	Attributable Tonnes (Mt)	Li_2O (%)	Cut-Off (% Li_2O)	Mass Yield	100% Concentrate Tonnes @ 6.0% Li_2O (Mt)	Attributable Concentrate Tonnes @ 6% Li_2O (Mt)
Resource Pit 2021	Indicated	31.8	15.6	1.54	0.57	17.2%	5.5	2.7
	Inferred	23.9	11.7	1.05	0.57	10.3%	2.5	1.2
Reserve Pit 2021 *	Indicated	2.6	1.3	0.64	0.57-0.70	5.2%	0.1	0.1
	Inferred	16.8	8.2	1.05	0.57-0.70	10.4%	1.8	0.9
Stockpiles	Inferred	0.3	0.1	1.40	0.50	15.0%	0.04	0.02

Source: SRK, 2021

- Albemarle’s attributable portion of mineral resources and reserves is 49%.
- Mineral resources are reported exclusive of ore reserves. Mineral resources are not mineral reserves and do not have demonstrated economic viability.
- Resources have been reported as in situ (hard rock within optimized pit shell) and stockpile (mined and stored on surface as blasted/crushed material).
- Resources have been categorized subject to the opinion of a QP based on the amount/robustness of informing data for the estimate, consistency of geological/grade distribution, survey information, and have been validated against long term mine reconciliation for the in-situ volumes.
- Resources which are contained within the mineral reserve pit design may be excluded from reserves due to an Inferred classification or because they sit in the incremental CoG range between the resource and reserve CoG. They are disclosed separately from the resources contained within the Resource Pit. There is reasonable expectation that some Inferred resources within the mineral reserve pit design may be converted to higher confidence materials with additional drilling and exploration effort.
- All Measured and Indicated Stockpile resources have been converted to mineral reserves.
- Mineral resources are reported considering a nominal set of assumptions for reporting purposes:
  - Mass Yields for chemical grade material are based on Greenbushes’ CGP1 feed mass yield formula. For the LoM material, mass yield is assumed at 29.49% and is subject to a 97% recovery limitation when the lithium oxide grade exceeds 5.5%. Mass yield varies as a function of grade, and may be reported herein at lower mass yields than the CGP1 average.
  - Pit optimization and economics for derivation of CoG include mine gate pricing of US$672/t of 6% Li_2O concentrate, US$ 4.75/t mining cost (LoM average cost-variable by depth), US$ 17.87/t processing cost, US$ 4.91/t G&A cost, and US$ 2.66/t sustaining capital cost.
  - Costs estimated in Australian Dollars were converted to US Dollars based on an exchange rate of 0.76AU$:1.00US$.
  - These economics define a CoG of 0.573% Li_2O.
  - An overall 43% pit slope angle, 0% mining dilution, and 100% mining recovery.
  - Resources were reported above this 0.573% Li_2O CoG and are constrained by an optimized break-even pit shell.
  - No infrastructure movement capital costs have been added to the optimization.
  - Stockpile resources have been previously mined between nominal CoG’s of 0.5 to 0.7% Li_2O.
- Mineral resources tonnage and contained metal have been rounded to reflect the accuracy of the estimate, and numbers may not add due to rounding.
- SRK Consulting (U.S.) Inc. is responsible for the mineral resources with an effective date: June 30, 2021.

Table 11-16: Greenbushes Summary In Situ Mineral Resources Inclusive of Mineral Reserves as of June 30, 2021 Based on US$672 of Concentrate at Mine Gate– SRK Consulting (U.S.), Inc.

Category	100% Tonnes (Mt)	Attributable Tonnes (Mt)	Li_2O (%)	Cut-Off (% Li_2O)	Mass Yield (%)
Indicated	171.5	84.0	1.89	0.57	22.7
Inferred	41.0	20.1	1.07	0.57	10.2

Source: SRK, 2021

- Albemarle's attributable portion of mineral resources and reserves is 49%.
- Mineral resources are reported inclusive of ore reserves. Mineral resources are not ore reserves and do not have demonstrated economic viability.
- Resources have been reported as in situ (hard rock within optimized pit shell).
- Resources have been categorized subject to the opinion of a QP based on the amount/robustness of informing data for the estimate, consistency of geological/grade distribution, survey information, and have been validated against long term mine reconciliation for the in-situ volumes.
- In-situ mineral resources are reported considering a nominal set of assumptions for reporting purposes:
    - The mass yield (MY) for reserves processed through the chemical grade plants is estimated by the Greenbushes CGP1 yield equation, but is subject to a 97% recovery limitation when the lithium oxide grade exceeds 5.5%.
    - Pit optimization and economics for derivation of CoG include mine gate pricing of US$672/t of 6% Li_2O concentrate, US$ 4.75/t mining cost (LoM average cost-variable by depth), US$ 17.87/t processing cost, US$ 4.91/t G&A cost, and US$ 2.66/t sustaining capital cost.
    - Costs estimated in Australian Dollars were converted to US Dollars based on an exchange rate of 0.76AU$:1.00US$.
    - These economics, and the internal constraints of the current lithium operations, define a CoG of 0.573% Li_2O.
    - An overall 43% pit slope angle, 0% mining dilution, and 100% mining recovery.
    - Resources were reported above this 0.573% Li_2O CoG and are constrained by an optimized break-even pit shell
    - No infrastructure movement capital costs have been added to the optimization.
- Mineral resources tonnage and contained metal have been rounded to reflect the accuracy of the estimate, and numbers may not add due to rounding.
- SRK Consulting (U.S.) Inc. is responsible for the mineral resources with an effective date: June 30, 2021.

Table 11-17: Greenbushes Summary Stockpile Mineral Resources Inclusive of Mineral Reserves as of June 30, 2021 – SRK Consulting (U.S.), Inc.

Category	100% Tonnes (Kt)	Attributable Tonnes (Kt)	Li_2O (%)	Cut-Off (%)	Mass Yield
Measured	360	176	1.60	0.5%	Variable
Indicated	4,234	2,075	1.30	0.5%	Variable
Measured + Indicated	4,294	2,251	1.30	0.5%	Variable
Inferred	289	142	1.40	0.5%	Variable

Source: SRK, 2021

- Albemarle's attributable portion of mineral resources and reserves is 49%.
- Mineral resources are reported inclusive of ore reserves. Mineral resources are not ore reserves and do not have demonstrated economic viability.
- Resources have been reported as stockpile (mined and stored on surface as blasted/crushed material).
- Resources have been categorized subject to the opinion of a QP based on the amount/robustness of informing data for the estimate, consistency of geological/grade distribution, survey information, and have been validated against long term mine reconciliation for the in-situ volumes.
- Mass Yields for stockpile material are variable but are generally assumed to follow the Greenbushes chemical grade yield equation for CGP1 that results in an average LoM mass yield assumption of 29.49%.
- Mineral resources tonnage and contained metal have been rounded to reflect the accuracy of the estimate, and numbers may not add due to rounding.
- SRK Consulting (U.S.) Inc. is responsible for the mineral resources with an effective date: June 30, 2021.

11.7.1 Mineral Resource Sensitivity

The primary sensitivities of the mineral resource as stated are costs, pricing, geotechnical factors, and weight recovery. A number of scenarios (Table 11-18) were developed to show the pit optimization variances at lower pricing scenarios (revenue factors). Note that these numbers may not exactly add to disclosed resource figures, as variable costs were utilized for the production of these figures, whereas resource reporting uses a fixed CoG. Sensitivities to variable geotechnical parameters (pit slope angles) have not been incorporated into this sensitivity.

Table 11-18: Pit Scenario Table – Greenbushes Mineral Resources

Pit	Rev Factor	Sell Price (US$)	Total Tonnes (Mt)	Indicated Tonnes (Mt)	Inferred Tonnes (Mt)	Spod Conc. Tonnes 6% (Mt)
1	0.3	$175	124	48	2	16
2	0.35	$204	168	61	3	19
3	0.4	$234	232	78	4	23
4	0.45	$263	263	86	5	25
5	0.5	$292	337	100	7	28
6	0.55	$321	378	107	8	29
7	0.6	$350	525	127	12	33
8	0.65	$380	589	134	14	35
9	0.7	$409	651	141	15	36
10	0.75	$438	707	146	16	37
11	0.8	$467	742	149	18	38
12	0.85	$496	785	153	19	39
13	0.9	$525	869	159	23	40
14	0.95	$555	966	165	29	42
15	1	$584	1,013	168	32	43
16	1.05	$613	1,055	170	35	43
17	1.1	$642	1,074	170	37	43
18	1.15	$671	1,130	172	39	44
19	1.2	$701	1,146	173	39	44
20	1.25	$730	1,208	175	42	45
21	1.3	$759	1,233	176	43	45

Source: SRK, 2021

- Mineral resources are reported inclusive of ore reserves and are disclosed here on a 100% (not attributable) basis. Mineral resources are not ore reserves and do not have demonstrated economic viability.
- Numbers reported here may not exactly match static resource tabulation due to the application of a continuously variance cost model for certain operational costs assumed in the pit optimization process.
- Variable mining costs are applied as the pit gets deeper and the cutoff is increased.

Note: Resource case.

To evaluate the sensitivity of the mineral resource to economic factors within the pit, SRK reported the resources contained within the resource pit (inclusive of reserves) at various cut-offs as shown in Table 11-19. This shows the overall sensitivity of the resource to the combined economic factors which constitute the CoG but is limited to not being able to show the impact to individual factors which comprise the CoG. SRK notes that, due to the relatively higher grades of the Greenbushes pegmatite, that there are relatively limited impacts to the overall resource within reasonable ranges of the 0.564% Li_2O CoG.

Table 11-19: Grade Tonnage – Pit-Constrained Mineral Resources Inclusive of Reserves

Cut-Off Grade (g/t)	Tonnes ≥ Cut-Off (Millions)	Average Grade ≥ Cut-Off (g/t)
0.05	271	1.43
0.10	271	1.43
0.15	270	1.44
0.20	264	1.47
0.25	255	1.51
0.30	247	1.55
0.35	239	1.59
0.40	232	1.63
0.45	226	1.66
0.50	220	1.69
0.55	214	1.72
0.60	208	1.75
0.65	203	1.78
0.70	199	1.81
0.75	195	1.83
0.80	190	1.86
0.85	185	1.89
0.90	180	1.91
0.95	175	1.94
1.00	170	1.97
1.05	166	1.99
1.10	161	2.02
1.15	155	2.06
1.20	149	2.09
1.25	144	2.12
1.30	138	2.16
1.35	132	2.19
1.40	127	2.23
1.45	121	2.27
1.50	115	2.31
1.55	109	2.35
1.60	104	2.39
1.65	99	2.43
1.70	94	2.47
1.75	89	2.51
1.80	84	2.55
1.85	80	2.59
1.90	75	2.64
1.95	71	2.68
2.00	68	2.71

Source: SRK, 2021
Mineral resources are reported inclusive of ore reserves. Mineral resources are not ore reserves and do not have demonstrated economic viability.

11.8 Opinion on Influence for Economic Extraction

SRK notes that the influence of the pit shell on the resource is significant, as resources do exist external to the shell. It is possible that additional resources could be developed with realization of higher commodities pricing, lower costs, as well as additional exploration. No boundaries or limitations were placed on the pit optimization scenario to account for infrastructure movement or other surface disturbance considerations, as these are considered modifying factors which are relevant to the mineral reserves. SRK is of the opinion that all relevant factors to the RPEEE of mineral resources have been considered as a part of this study.

12 Mineral Reserve Estimates

The conversion of mineral resources to mineral reserves has been completed in accordance with SEC regulations CFR 17, Part 229 (S-K 1300). Mineral reserves were estimated based on a spodumene concentrate sales price of US$650/t of concentrate CIF China (or US$577/t of concentrate at the mine gate). The mineral reserves are based on PFS level study as defined in §229.1300 *et seq*.

The mineral reserve calculations for the Greenbushes Central Lode lithium deposit have been carried out by a Qualified Person as defined in §229.1300 et seq. SRK is responsible for the mineral reserves reported herein.

Greenbushes is an operating mine that uses conventional open pit methods to extract mineral reserves containing economic quantifies of Li_2O to produce both chemical and technical grade spodumene concentrates.

12.1 Key Assumptions, Parameters, and Methods Used

The key mine design assumptions, parameters and methods are summarized as follows.

12.1.1 Resource Model and Selective Mining Unit

The in situ mineral resources are based on the SRK block model as described in Section 11 of this report, including appropriate mining depletion as described in Section 11.2.6. The SRK block model is depleted to June 30, 2021. The SRK block model was used without modification, as the subblock size in the model matches the selective mining unit (SMU) size that was adopted for mine planning purposes.

12.1.2 Pit Optimization

The mineral reserves are reported within an ultimate pit design that was guided by pit optimization (Lerch-Grossman algorithm). The pit optimization considered only Indicated mineral resources as there are no in situ Measured resources in the SRK block model. Inferred resource blocks were assigned a Li_2O% grade of zero prior to pit optimization and were treated as waste.

The overall pit slopes used for pit optimization are based on operational level geotechnical studies and range from 27° to 50°. This includes a 5° allowance for ramps and geotechnical catch benches.

Pit optimization parameters are shown in Table 12-1.

Table 12-1: Pit Optimization Parameters

Parameter	Unit	Value
Average Mining Cost (varies by depth)	US$/t	5.57
Average Processing Cost	US$/t ore	17.87
G&A Cost	US$/t ore	4.91
Sustaining capital cost	US$/t ore	2.66
Mass Yield Chemical Grade Plants	%	LoM 22.94%
Mass Yield Technical Grade Plant	%	LoM 46.18%
Gross Sales Price (CIF China)	US$/t of 6% Li_2O Conc	650
Shipping, Transportation and Royalty	US$/t of 6% Li_2O Conc	73
Net Sales Price (mine gate)	US$/t of 6% Li_2O Conc	577
Discount Rate	%	8.0

Note: the Greenbushes mass yield equation is subject to a 97% recovery limitation when the lithium oxide grade exceeds 5.5%.
Source: SRK, 2021

It is noted that the preliminary cost parameters used for pit optimization differ slightly from the final estimated costs used in the technical economic model (TEM) discussed in Section 19 of this report. The slight differences in costs are not considered material.

The summary pit optimization results are shown in Table 12-2. The revenue factor (RF) 0.85 pit shell was selected to guide the design of the ultimate reserves pit. This pit shell is highlighted as “Pit 14” in Table 12-2. The RF 0.85 pit corresponds to a mine gate price of US$496/t of 6% Li_2O concentrate (i.e., 85% of the mine gate reserves price of US$577/t of 6% Li_2O concentrate).

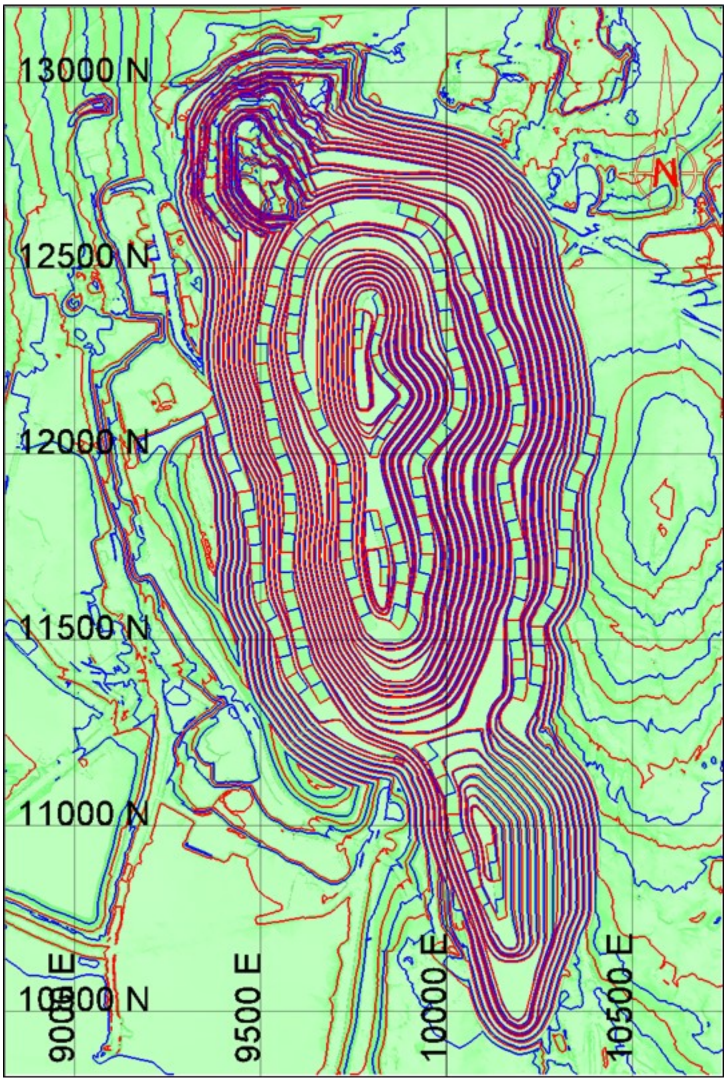
Table 12-2: Summary Pit Optimization Results

Pit Shell	Revenue Factor	Mine Gate Selling Price (US$/t-conc)	Strip Ratio (w:o)	Total Ore + Waste (Mt)	Ore (Mt)	Waste (Mt)	6% Li_2O Concentrate (Mt)	Mass Yield (%)	Diluted Grade (Li_2O%)
1	0.2	117	0.8	28.55	16.0	12.5	6.19	0.386	2.894
2	0.25	146	1.2	65.1	29.6	35.5	10.6	35.6	2.71
3	0.3	175	1.5	114.9	46.4	68.5	15.0	32.2	2.51
4	0.35	204	1.7	158.4	58.2	100.1	17.8	30.6	2.41
5	0.4	234	1.9	231.9	78.7	153.1	22.1	28.1	2.25
6	0.45	263	2.0	249.7	83.8	165.9	23.1	27.5	2.22
7	0.5	292	2.3	321.4	98.5	222.9	25.8	26.2	2.14
8	0.55	321	2.3	347.4	103.8	243.6	26.8	25.8	2.11
9	0.6	350	2.5	392.8	111.4	281.4	28.1	25.2	2.08
10	0.65	380	2.9	496.6	126.2	370.4	30.8	24.4	2.02
11	0.7	409	3.0	516.2	128.8	387.5	31.3	24.3	2.01
12	0.75	438	3.1	544.7	132.8	411.9	31.9	24.0	1.99
13	0.8	467	3.3	598.1	139.4	458.7	33.0	23.7	1.97
14	0.85	496	3.5	641.5	142.9	498.7	33.7	23.6	1.97
15	0.9	525	3.5	642.3	143.0	499.3	33.7	23.6	1.96
16	0.95	555	3.6	669.9	145.6	524.4	34.1	23.4	1.96
17	1	584	3.6	678.8	146.5	532.3	34.2	23.4	1.95
18	1.05	613	3.6	683.4	147.0	536.4	34.3	23.3	1.95
19	1.1	642	3.7	690.3	147.7	542.6	34.4	23.3	1.95
20	1.15	671	3.7	706.6	149.2	557.4	34.6	23.2	1.94
21	1.2	701	3.8	728.6	151.0	577.6	34.8	23.1	1.93
22	1.25	730	3.8	731.3	151.2	580.1	34.8	23.1	1.93
23	1.3	759	3.9	738.6	151.8	586.9	34.9	23.0	1.93

Source: SRK 2021

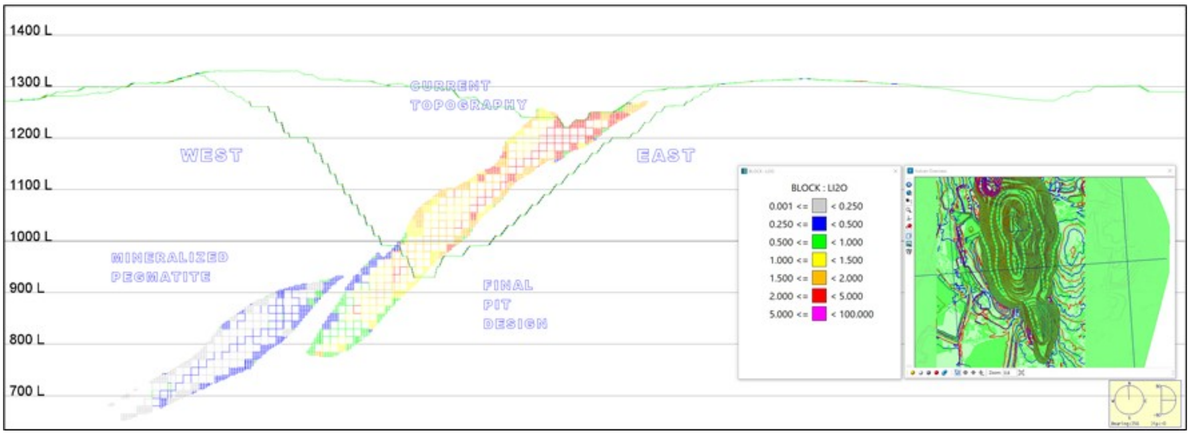
12.1.3 Ultimate Pit and Phase Design

A 3D mine design based on optimized Pit 14 was completed using Vulcan software and is the basis for the in situ mineral reserves. The reserves pit has been designed with 10 m benches, variable bench widths, variable face angles and overall wall angles of between 27° and 50°. Local berm angles vary with local ground conditions and in some areas a double bench is applied (20 m bench height with zero catch bench). Ramp width is 20 m for single-way and 33 m for two-way traffic. The ramp gradient is 1:10. The ultimate pit floor is designed at 890 mRL, with a maximum wall height of approximately 430 m. The pit has been designed with a dual ramp system with exits on both the east and west walls. Figure 12-1 is a plan view of the final pit design that was used for mineral reserves, and Figure 12-2 is a section view through the middle part of the final design pit.



Source: SRK, 2021

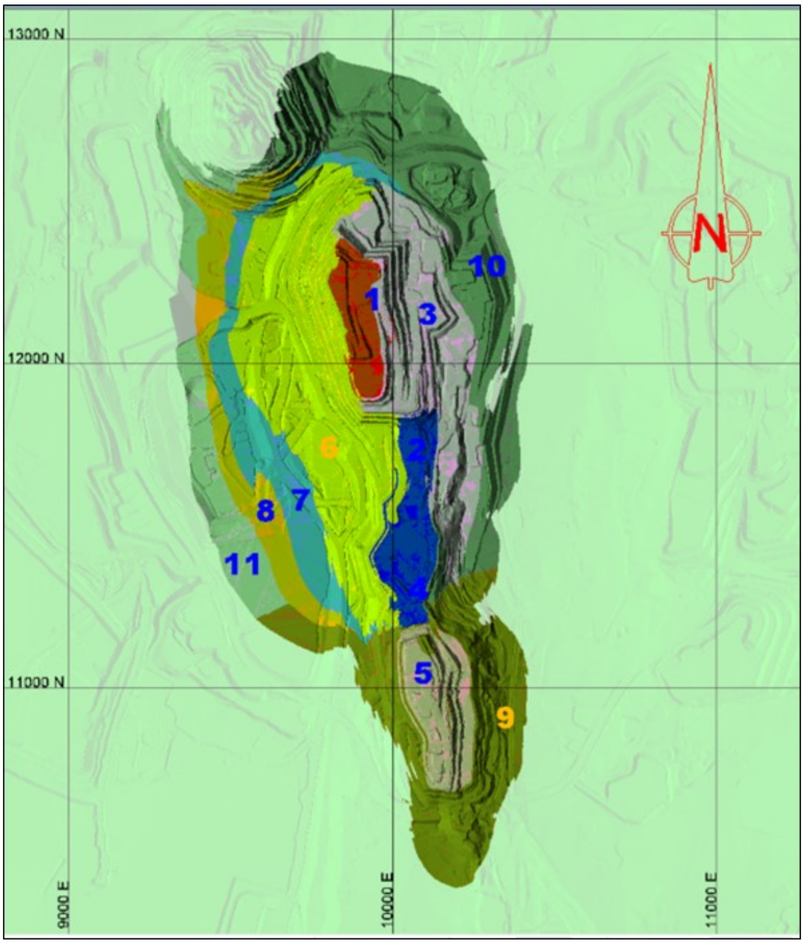
Figure 12-1: Plan View of the Ultimate Pit Design



Source: SRK, 2021

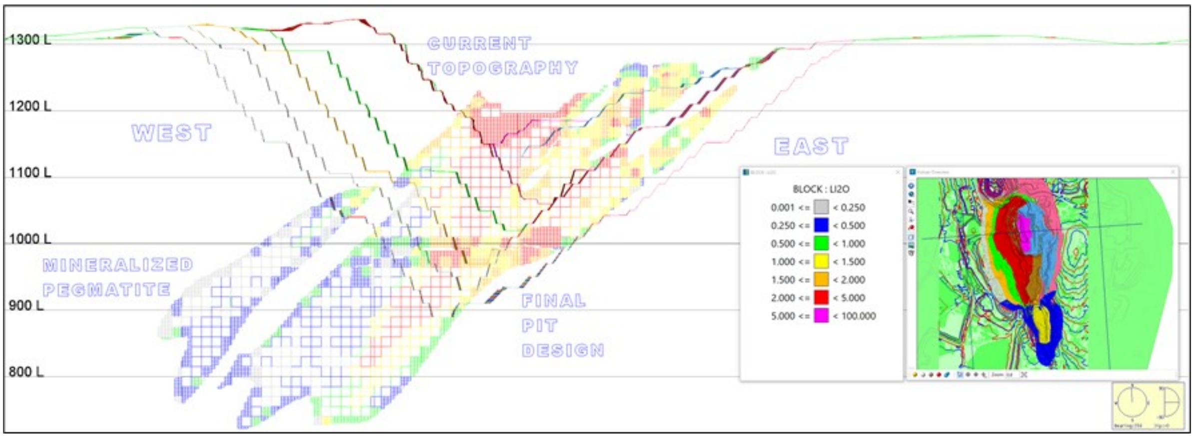
Figure 12-2: Section View of Ultimate Pit Design (Looking North)

Phase design resulted in a total of eleven phases being designed, with the ultimate reserves pit representing the eleventh and final phase. Figure 12-3 shows the location of the eleven pit phases in plan view. Figure 12-4 is a sectional view though the northern part of the ultimate pit showing multiple nested phases. Figure 12-5 is a 3D view of the ultimate pit and the final waste rock dump.



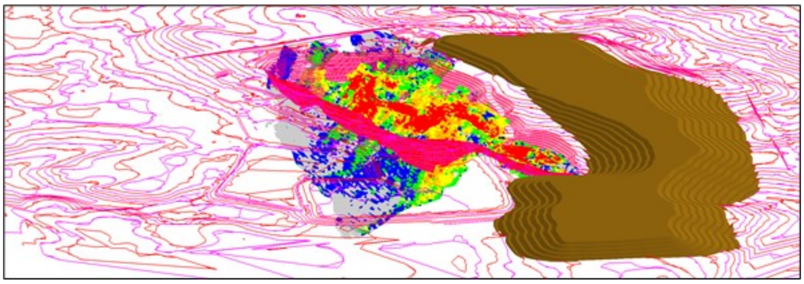
Source: SRK, 2021

Figure 12-3: Plan View of Phase Design (11 Phases)



Source: SRK, 2021

Figure 12-4: Section View of Phase Design (Looking North)



Source: SRK, 2021

Figure 12-5: Greenbush Final Pit and Waste Dump Design 3D View with Mineralized Pegmatite

12.2 Modifying Factors

Modifying factors are the factors that are applied to Indicated and Measured mineral resources to establish the economic viability of mineral reserves. For Greenbushes, the modifying factors include mining dilution, mining recovery, processing recovery (mass yield), and application of a CoG. The CoG incorporates processing recovery and operating costs (mining, processing, G&A) and is applied to the diluted grade of each Indicated and Measured block inside the reserves pit. Each of the modifying factors is discussed below.

12.2.1 Mining Dilution and Mining Recovery

Based on reconciliation data for prior resource block models, the Greenbushes operation has historically applied a 95% grade factor and 100% mining recovery to the mineral reserves. The 95% grade factor was intended to account for, among other things, external dilution introduced by the mining process.

The new SRK resource block model includes 2.7% internal dilution for all Indicated resource subblocks (5 m by 5 m by 5 m) inside the reserves pit. In addition to this internal dilution, SRK has applied 20% external dilution and 80% mining recovery to all blocks that fall on the ore/waste contact (“perimeter blocks”). Perimeter blocks make up approximately 16% of the total mineral reserve. The remainder of the blocks (non-perimeter blocks) have no external mining dilution applied and are assigned 100% mining recovery.

12.2.2 Processing Recovery

Processing recovery is discussed in Section 14 of this report. For the purposes of converting mineral resources to mineral reserves, two mass yield (MY) equations were applied.

- For reserves that will be processed through the technical grade plant, the mass yield of concentrate was determined at the block level using by applying the greenbushes mass yield equation. (LoM result is 46.18%).
- For reserves that will be processed through the chemical grade plants, the mass yield (MY) of concentrate was determined by applying the greenbushes mass yield equation. (LoM

22.4%). Where the lithium oxide grade is greater than 5.5%, a maximum recovery of 97% is applied.

The mass yield for CGP2 is currently less than CGP1; however, SRK's opinion is that CGP2 will eventually achieve an average mass yield similar to CGP1 based on improvement initiatives that Greenbushes plans to implement. For this reason, SRK has reduced the forecast mass yield for CGP2 until the end of 2023. For 2024 onward, CGP2 has been assigned the same mass yield equation as CGP1.

Although Greenbushes produces a technical grade product from the current operation, it is assumed that the reserves reported herein will be sold as a chemical grade product. This assumption is necessary because feed for the technical grade plant is currently only defined at the grade control or blasting level. Therefore, it is conservatively assumed that concentrate produced by the technical grade plant will be sold at the chemical grade product price (US$577/t of 6% Li_2O concentrate at the mine gate).

12.2.3 Cut-Off Grade Estimate

The CoG estimation is based on assumptions and actual performance of the Greenbushes operation. Concentrate attributes and production cost inputs to the cut-off calculation are presented in Table 12-3. Recovery of a 6% Li_2O concentrate is based on the previously noted weight recovery calculations from actual operational data.

The basis for the reserves price forecast is discussed in Section 16.3 of this report. Considering forecast operating costs, predicted mass yield and the forecast sales price, SRK calculated a CoG of 0.644% Li_2O. However, based on the internal constraints of the current operations, a nominal 0.7% Li_2O CoG was utilized to report mineral reserves.

Drilling, blasting, loading and hauling and mining overhead costs are excluded from the CoG calculation for in situ material because the pit design was guided by economic pit optimization. I.e., only incremental ore mining costs (RoM loader, rehandle from long-term stockpiles, grade control assays, and rockbreaking) were considered in the decision whether to send material to the waste dump or to the processing plant.

This CoG was applied to both in situ and stockpile material, although SRK notes that stockpiles are generally used to augment other material types for processing during active mining.

Table 12-3: Cut-Off Grade Calculation

Revenue	Units	Value
Cut-Off Grade	Li_2O%	0.644
Mass Yield	t of 6% Li_2O Concentrate	0.052
Price at Mine Gate	US$/t of 6% Li_2O Concentrate	577.00
Total Revenue	US$/t-RoM	30.19
Costs		
Incremental Ore Mining	US$/t-RoM	4.75
Processing	US$/t-RoM	17.87
G&A	US$/t-RoM	4.91
Sustaining Capital	US$/t-RoM	2.66
Total Cost	**US$/t-RoM**	**30.19**

Notes:
(1) The greenbushes mass yield equation relults in a LoM mass yield of 22.04% mass yield subject to a 97% recovery limitation when the lithium oxide grade exceeds 5.5%.
(2) Incremental ore mining costs include RoM loader, rehandle from long-term stockpiles, grade control assays, and rock breaker.
(3) Based on the internal constraints of the current operations, a nominal 0.7% Li_2O CoG was utilized to report mineral reserves.
Source: SRK, 2021

12.2.4 Material Risks Associated with the Modifying Factors

SRK has identified the following material risks associated with the modifying factors:

- Product Sales Price:
  - The price achieved for sales of spodumene concentrates is forecast based on predicted supply and demand changes for the lithium market on the whole. There is considerable uncertainty about how future supply and demand will change which will materially impact future spodumene concentrate prices. The reserve estimate is sensitive to the potential significant changes in revenue associated with changes in spodumene concentrate prices.
- Mining Dilution and Mining Recovery:
  - The mining dilution estimate depends on the accuracy of the resource model as it relates to internal waste dilution/dikes identification. Due to the spacing of the resource drill holes, it is not possible to identify all of the waste dikes the operation will encounter in the future. SRK studied the historical dilution factors and applied a 3D dilution halo around ore and waste contact blocks. This is accurate as long as the resource model identifies all the waste dikes; however, it is known that this is not always possible with the resource drilling. If an increased number of waste dikes are found in future mining activities, the dilution may be greater than estimated because there will be more ore blocks in contact with waste blocks. This would potentially introduce more waste into the plant feed, which would decrease the feed grade, slow down the throughput and reduce the metallurgical recovery. A potential mitigation would be to mine more selectively around the waste dikes, although this would result in reduced mining recovery.
- Impact of Currency Exchange Rates on Production Cost
  - The operating costs are modeled in Australian dollars (AU$) and converted to US$ within the cash flow model. The foreign exchange rate profile for the model was provided by

Albemarle. If the AU$ strengthens, the cash cost to produce concentrate would increase in US$ terms and this could potentially reduce the mineral reserves estimates.

- Geotechnical Parameters:
  - Geotechnical parameters used to estimate the mineral reserves can change as mining progresses. Local slope failures could force the operation to adapt to a lower slope angle which would cause the strip ratio to increase and the economics of the pit to change.
- Processing Plant Throughput and Mass Yields:
  - The forecast cost structure assumes that the technical grade plant and the two chemical grade plants remain fully operational and that the estimated mass yield assumptions are achieved. If one or more of the plants does not operate in the future, the cost structure of the operation will increase. If the targeted mass yield is not achieved, concentrate production will be lower. Both of these outcomes would adversely impact the mineral reserves.

12.3 Summary Mineral Reserves

The conversion of Indicated mineral resources to Probable mineral reserves has been completed in accordance with CFR 17, Part 229 (S-K 1300). Mineral reserves were estimated based on a spodumene concentrate (6% Li_2O) price of US$650/t of concentrate CIF China or US$577/t of concentrate at the mine gate. The reserves are based on a reserves pit that was guided by pit optimization. Appropriate modifying factors have been applied as previously discussed. The positive economics of the mineral reserves have been confirmed by LoM production scheduling and cash flow modeling as discussed in sections 13 and 19 of this report, respectively.

Table 12-4 shows the Greenbushes mineral reserves as of June 30, 2021.

Table 12-4: Greenbush Summary Mineral Reserves at June 30, 2021 Based on US$577/t of Concentrate Mine Gate – SRK Consulting (U.S.), Inc.

Classification	Type	100% Tonnes (Mt)	Attributable Tonnes (Mt)	Li_2O%	Mass Yield (%)	100% Concentrate (Mt)	Attributable Concentrate (Mt)
Probable Mineral Reserves	In situ	138.1	67.7	1.97	22.6%	31.3	15.3
	Stockpiles	4.6	2.3	1.31	13.4%	0.6	0.3
	In situ + Stockpiles	142.7	69.9	1.95	22.3%	31.9	15.6

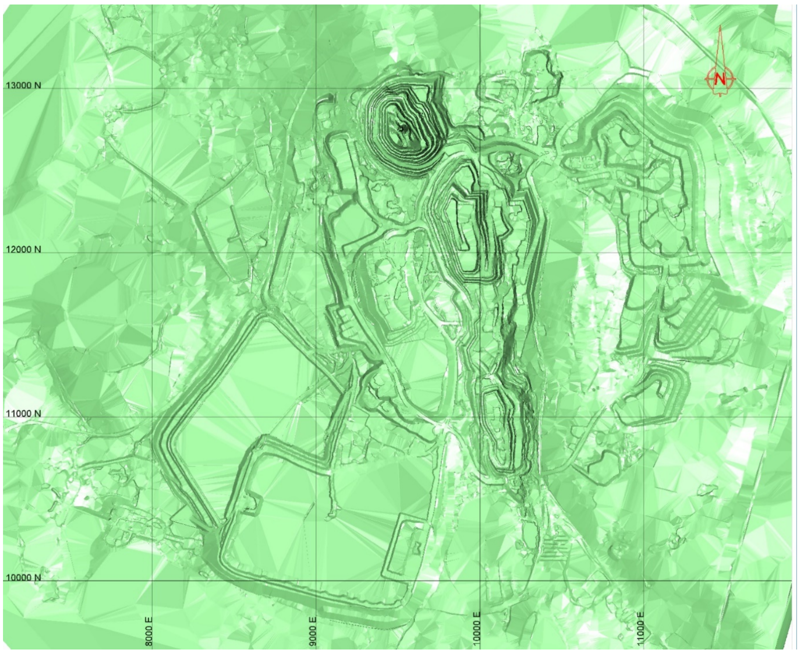
Source: SRK, 2021

- Albemarle's attributable portion of mineral resources and reserves is 49%.
- Mineral reserves are reported exclusive of mineral resources.
- Indicated in situ resources have been converted to Probable reserves.
- Measured and Indicated stockpile resources have been converted to Probable mineral reserves.
- Mineral reserves are reported considering a nominal set of assumptions for reporting purposes:
    - Mineral reserves are based on a mine gate price of US$577/t of chemical grade concentrate (6% Li_2O).
    - Mineral reserves assume 80% mining recovery for ore/waste contact areas and 100% for non-waste contact material
    - Mineral reserves are diluted at approximately 20% at zero grade for ore/waste contact areas in addition to internal dilution built into the resource model (2.7% with the assumed selective mining unit of 5 m x 5 m x 5 m)
    - The mass yield (MY) for reserves processed through the chemical grade plants is estimated by the based on Greenbushes' mass yield formula and the LoM mass yield is 29.49% but is subject to a 97% recovery limitation when the lithium oxide grade exceeds 5.5%.
    - The mass yield (MY) for reserves processed through the chemical grade plant CGP2 in the next three to four years is estimated by the based on Greenbushes' mass yield formula for a LoM mass yield of 16.77%, but is subject to a 97% recovery limitation when the lithium oxide grade exceeds 5.5%. The CGP2 plant is going through a ramp up period where lower recoveries are expected until all equipment has been optimized and additional capital is spent.
    - The mass yield (MY) for reserves processed through the technical grade plant is estimated by the based on Greenbushes' mass yield formula and the LoM mass yield is 46.18%. There is approximately 3.5 Mt of technical grade plant feed at 4% Li_2O
    - Although Greenbushes produces a technical grade product from the current operation, it is assumed that the reserves reported herein will be sold as a chemical grade product. This assumption is necessary because feed for the technical grade plant is currently only defined at the grade control or blasting level. Therefore, it is conservatively assumed that concentrate produced by the technical grade plant will be sold at the chemical grade product price
    - Pit optimization and economics for derivation of CoG include mine gate pricing of US$577/t of 6% Li_2O concentrate, US$ 4.75/t mining cost (LoM average cost-variable by depth), US$ 17.87/t processing cost, US$ 4.91/t G&A cost, and US$ 2.66/t sustaining capital cost. The mine gate price is based on US$650/t-conc CIF less US$73/t-conc for government royalty and transportation to China.
    - Costs estimated in Australian Dollars were converted to US Dollars based on an exchange rate of 0.76AU$:1.00US$.
    - The price, cost and mass yield parameters, along with the internal constraints of the current operations, result in a mineral reserves CoG of 0.7% Li_2O.
    - The CoG of 0.7% Li_2O was applied to reserves that are constrained by the ultimate pit design and are detailed in a yearly mine schedule
    - Stockpile reserves have been previously mined and are reported at a 0.7% Li_2O CoG
- Waste tonnage within the reserve pit is 459 Mt at a strip ratio of 3.32:1 (waste to ore – not including reserve stockpiles)
- Mineral reserve tonnage, grade and mass yield have been rounded to reflect the accuracy of the estimate, and numbers may not add due to rounding
    - Mt = millions of metric tonnes
    - Reserve tonnes are rounded to the nearest hundred thousand tonnes
- SRK Consulting (U.S.) Inc. is responsible for the mineral reserves with an effective date: June 30, 2021

13 Mining Methods

Greenbushes is an operating mine that uses conventional open pit methods to extract mineral reserves containing economic quantities of Li_2O to produce both chemical and technical grade spodumene concentrates. Historically there was underground and open pit mining at Greenbushes, but the mineral reserves and LoM plan are based only on open pit mining.

Figure 13-1 illustrates the current status of the Greenbushes Central Lode open pit.



Source: SRK, 2021

Figure 13-1: Greenbush Central Lode Pit as of June 30, 2021

13.1.1 Current Mining Methods

The material encountered at Greenbush is a combination of weathered material within the first 20 to 40 m with a small transition zone followed by fresh rock. The weathered zone is loosely consolidated sand which can be mined without the need for drilling and blasting. Mineralization is not present in the weathered zone thus drilling for the purposes of ore control and waste classification is not necessary. Sand and historical waste dumps are mined without blasting.

Drilling and blasting are required in all hard rock (both ore and waste). Drilling and blasting services are performed by a contractor (currently Action Drilling and Blasting) with explosives supplied by Orica. Production drilling is performed with Atlas Copco T45 and D65 drills with hole diameters ranging in diameter from 115 mm to 165 mm depending on material type and application. Blast hole depth in waste is 10 m (plus subdrill) and 5 m in ore (plus subdrill). Grade control is performed by reverse circulation (RC) drills rigs that drill 137 mm diameter holes that are sampled on 2.5 m intervals.

Flitch height is variable. Waste is typically mined on a 10 m flitch. Ore is typically mined on 5 m flitches.

A contractor (SG Mining Pty Ltd) provides all necessary equipment and operating/maintenance personnel for the load and haul operations. The load and haul contractor’s current equipment fleet are shown in Table 13-1.

Table 13-1: Load and Haul Contractor Mining Fleet

Make	Model	Type	No. of Units
Komatsu	PC1250-8	Excavator	2
Caterpillar	6015B	Excavator	2
Caterpillar	988G/H/K	Loader	5
Caterpillar	992K	Loader	1
Caterpillar	777F/G	Dump Truck (90t)	12
Caterpillar	D10R/T	Dozer	2
Caterpillar	16G/H	Grader	2
Caterpillar	IT28B	Tool Carrier	1
Caterpillar	930K	Tool Carrier	1
Caterpillar	777F	Watercart	2
Hino	-	Service Truck	1
Toyota	Hilux	Dual Cab	9
Toyota	Landcruiser	Wagon	1
Toyota	Landcruiser	Tray Back	3
Allight	Diesel	Lighting Plant	13
Lincoln	Vantage 575	Mobile Welder	1
Austin Eng	TH2500	Tyre Handler	1
AAQ	AS4000	LV Hoist S2	1
Deutz / Stalker	TCD2011	Stand-pipe pump	1

Source: Talison, 2021

Ore is taken to the RoM pad where it is stockpiled according to ore type, mineralogical characteristics and grade. Waste is taken to the waste dump to the east of the pits.

13.2 Parameters Relevant to Mine Designs and Plans

13.2.1 Geotechnical

Slope stability and bench design analyses have been conducted by Pells Sullivan Meynink Consult Pty (PSM) on the 2019 pit design to assess the stability of pit slopes during operations. The existing slope performance is typically good with no instances of inter-ramp failures which is supported by prism data. Bench-scale instabilities and rockfall are the principal geotechnical hazards which are managed operationally. Slope stability analyses include kinematic assessments, limit equilibrium and FEM stability analyses and rockfall assessments.

The adopted slope design acceptance criteria include:

- Bench face angles of 10% to 30% probability of undercutting
- Inter-ramp slope angles of 3% to 5% probability of undercutting
- Inter-ramp slope factor of safety greater than 1.2
- Overall slope factor of safety greater than 1.5

Results of PSM’s analyses showed that the 2019 pit design met the above stability acceptance criteria. PSM noted that the west hangingwall is higher risk than the east footwall because the ore plunges beneath the west wall and each push back must remain stable to recover the reserves.

Recent work by PSM (PSM2193-060R, 2/2021) reevaluated the geotechnical model with all the existing data. The result of this work was updated slope design parameters summarized in Table 13-2.

Table 13-2: Slope Design Parameter for Kapanga Pit

Slope Design Sector	Inter-Ramp Angle (°)	Bench Configuration		
		Bench Face Angle (°)	Bench Height (m)	Berm Width (m)
Waste Dumps	12 to 14°	Single batter configuration		
Weathered Zone (< 30 m height)	40°			
Weathered Zone (> 30 m and < 50 m height)	30°	40	20	11
KEW 1	38°	50	20	8.5
KEW 2	42°	55		
KWW	55°	75		

Source :Talison, 2021

Key risks that were identified by PSM were:

- The bullnose was a stability risk. SRK has removed the bullnose in the current pit design.
- Hydrogeological conditions, particularly in relation to bench face stability due to pore pressures and dewatering. SRK has recommended additional work be done on hydrogeological conditions before the pit wall gets through the weathered zone.
- The character and orientation of the PB Geology Interpretation structures in the recent geological model in the Central Lobe west and east walls have a high degree of uncertainty and may impact the slope design. SKR has recommended that as stripping begins the geologists/geotechnical engineers evaluate the consistency and orientation of these structures.

PSM recommended that additional work should be conducted on hydrogeological conditions because pore pressures will reduce wall stability, especially where structures form wedges and when large precipitation periods persist. Safety risks are focused on rockfall events because benches are only 8.5 m wide, and a high percent of loose boulders can make it to the working floor. Future monitoring should include radar such that minor events can be used to predict more major rockfall events thereby mitigating safety risks.

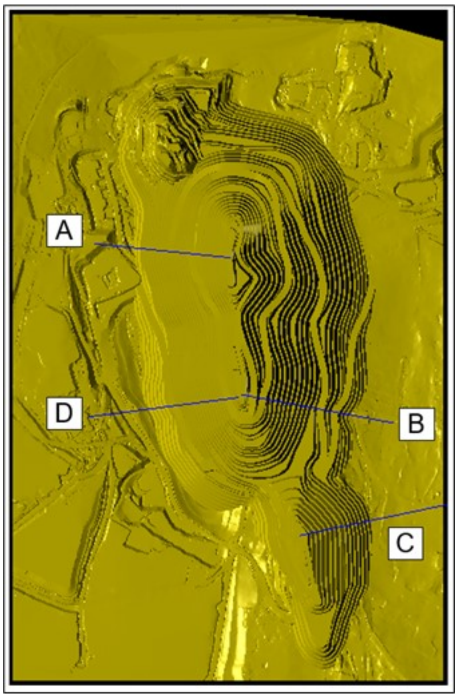
Updated Stability Analysis

SRK has reanalyzed pit slope stability with the SRK reserve pit design described in Section 12. The following is a description of the analyses input, assumptions and results.

Two-dimensional limit equilibrium stability analyses were conducted along critical cross sections of the 2020 pit design. The most recent 3D geologic solids developed in Leapfrog were imported to Vulcan as was the 3D ultimate pit shell. Cross sections were cut in Vulcan and exported as DXF files into the Rhino visualization program so that re-orientation would allow the 2D model to be in X,Y coordinates. The cross sections were imported to the RocScience Slide (2018) limit equilibrium program. Metric units were used for the analysis.

The stability solution is based on Spencers' method of slices where the slope was discretized into 50 slices and 75 iterations were used to compute the balance of forces. A non-circular search path was used with over 5000 potential failure surfaces. The results are presented as the minimum factor of safety (FOS) potential failure surface.

Material properties were taken from Table 25 in PSM for the Upper Weathered Zone (Mohr-Coulomb behavior), Kapanga Pegmatite, Granofels, Lower East Amphibolite and North West Dolerite (each Hoek-Brown behavior). The critical cross section locations for the stability analyses are identified in Figure 13-2.



Source: SRK 2021

Figure 13-2: Plan View of 3D 2020 Ultimate Pit with Slope Stability Cross Section Locations

Table 13-3 is a summary of the results. These results indicate that all the sections analyzed have a FOS greater than the minimum acceptable criteria. The reduced strength case assumed an approximate 10% strength reduction by reducing the cohesion of the Upper Weathered Zone by 10% and reducing the GSI values for the other rock units by about five points. Results of the stability analyses are provided in detail in SRK (2020).

Table 13-3: Summary of Limit Equilibrium Stability Analysis Minimum Factor of Safety

Section	Location	Average Strength		Reduced Strength	
		Global FOS	Local FOS	Global FOS	Local FOS
A	North West C3 Highwall	2.5		2.2	
B	South East C2 Highwall	3.9		3.4	
C	East C1 Wall	7.5	1.4	6.2	1.3
D	South West C2 Highwall	3.1	1.8	2.5	1.8

Source: SRK 2021

Potential Geotechnical Risks

The greatest gap appears to be hydrogeology data and analyses. Slope performance section of the PSM report has no descriptions of seeps or wet spots and slope stability analyses only considered dewatering of 10 m within bench face.

During mining, Greenbushes might encounter voids from historic workings. There is no discussion in the PSM report about whether workings are flooded, or elevation of workings compared to piezometer estimates of groundwater levels.

The weathered zone at the surface has the potential to continue to move, especially if the zone is saturated. It is essentially a soil. It will be important to monitor gradual movements and have operations occasionally clear benches, especially on the steeper west wall and during the wet season.

The 2019 proposed inter-ramp angles are more aggressive (by 5° to 7°) than previously proposed, even though no new data has been collected. Although slope factors of safety are still higher than the minimum acceptance criteria, the steeper slopes could result in increased rockfall events

The PSM geotechnical report makes no mention of current blasting practices and their impact on bench stability. Blasting practices should be reviewed.

Stability of the bullnose between the Cornwall pit and Central pit has not been examined for stability. This is important, especially because this is the area where the historic underground workings are located. These workings could have an adverse impact on the overall stability of the deeper northwest wall of the Central pit, especially if groundwater interaction is involved.

13.2.2 Hydrological

The low hydraulic conductivity of the resource hosting rocks, and lack of significant aquifer storage, decreases operational concerns for mine dewatering. Dewatering to date has been managed through in-pit sumps and pumping to remove passive groundwater inflow and storm event precipitation. Current passive groundwater inflow to the pit is less than 10 L/s. Due to the low hydraulic conductivity of the host rocks, pore pressure may be a concern, however this has been adequately managed to date with the installation of lateral drains as necessary. Proposed expansion will not change the appropriateness of the current inflow management strategy within the pit, nor the adequacy based on the current available data.

Surface water, primarily in the form of short-term flow from precipitation events, is managed through a network of natural and engineered drainages to direct capture of precipitation behind five dams (Cowan, Brook, Southampton/Austin's Dam, Clear Water Dam, Clear Water Pond, and Tin Shed Dam). These structures serve to feed several water supply impoundments across the mine site, water not used in site operations is released through evaporation or very slow seepage through the clay underlining.

All water usage on site is derived from capture of surface water run-off and groundwater production from removal of passive groundwater inflow to the pit. There are no groundwater production wells to support mine operations.

Potential Hydrologic Risks

The primary hydrology concern is the availability of water to support mining operations. The mine water supply is limited by the annual precipitation, storage capacity behind dams, and overall efficiency of the surface water management system to recycle water from the TSFs. The infrastructure has adequately performed to date, supplying sufficient water to support mine operations. However, due to these potentially limiting factors, additional surface water storage facilities may need to be constructed to support expansion of operations. Section 15.6 further discusses mine water supply and infrastructure.

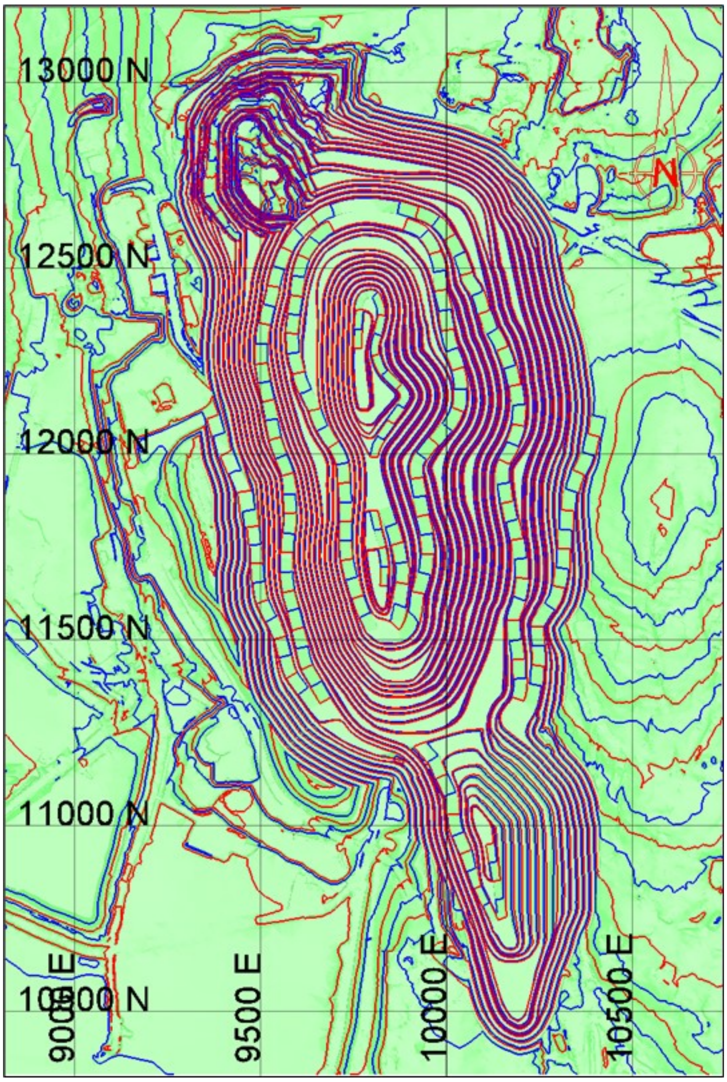
13.3 Mine Design

13.3.1 Pit Design

Pit optimization and design are discussed in detail in Section 12 of this report. The major design parameters used for the open pit are as follows:

- Ramp grade = 10%
- Full ramp width = 33 m (3x operating width for 777F/G)
- Single ramp width = 20 m for up to 60 m vertical or six benches
- Minimum mining width = 40 m but targets between 100 m to 150 m
- Flat switchbacks
- Bench heights, berm widths and bench face angles in accordance with current site-specific design criteria

Figure 13-3 illustrates the LoM reserves pit design and associated ramp system. Ramp locations targeted saddle points between the various pit bottoms with ramps also acting as catch benches for geotechnical purposes. Each bench has at least one ramp for scheduling purposes.



Source: SRK, 2021

Figure 13-3: LoM Pit Design

Grade Tonnage

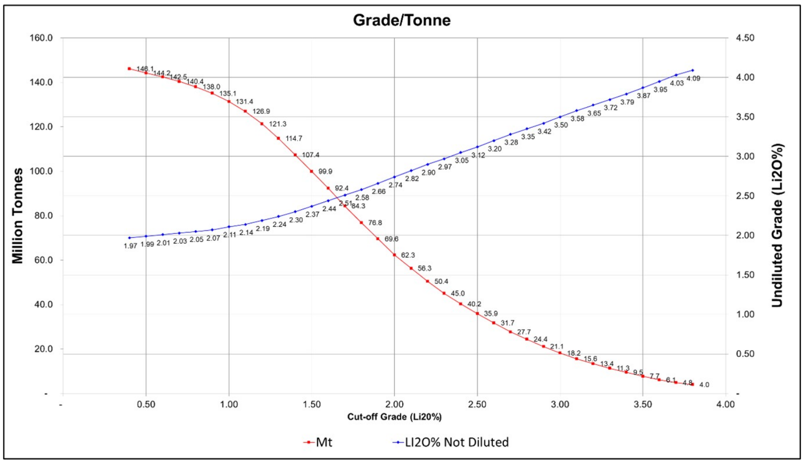
Table 13-4 details the grade tonnage at various cut-offs within the reserves pit design. The CoG used for reserves is 0.7 Li_2O%.

Table 13-4: Grade Tonnage Curve within the Reserves Pit (Not Diluted) – Current Stockpiles Not Included

Cutoff	Undiluted Li_2O%	Mt
0.40	2.02	138.3
0.50	2.02	138.3
0.60	2.02	138.3
0.70	2.02	138.3
0.80	2.04	135.9
0.90	2.06	133.0
1.00	2.1	129.4
1.10	2.13	124.9
1.20	2.18	119.3
1.30	2.23	112.8
1.40	2.29	105.5
1.50	2.36	98.1
1.60	2.42	90.6
1.70	2.5	82.7
1.80	2.57	75.2
1.90	2.65	68.0
2.00	2.73	60.8
2.10	2.81	54.9
2.20	2.88	49.1
2.30	2.96	43.7
2.40	3.04	39.0
2.50	3.11	34.7
2.60	3.19	30.5
2.70	3.27	26.6
2.80	3.34	23.3
2.90	3.42	20.1
3.00	3.49	17.2
3.10	3.57	14.7
3.20	3.64	12.6
3.30	3.71	10.6
3.40	3.79	8.9
3.50	3.86	7.2
3.60	3.95	5.6
3.70	4.03	4.5
3.80	4.09	3.7

Source: SRK 2021

Figure 13-4 shows the grade tonnage curve graphically above a 0.40% Li_2O lower limit.



Source: SRK 2021

Figure 13-4: Grade Tonnage Curve within Reserve Pit (Undiluted Li_2O% Grades)

Phase Design Inventory

The ultimate pit has been broken into eleven mine phases for sequenced extraction in the LoM production schedule. The design parameters for each phase are the same as those used for the ultimate pit including assumed ramp widths. Phase designs were constructed by splitting up the ultimate pit into smaller and more manageable pieces, while still ensuring each bench within each phase has ramp access. The phases have been developed by balancing mining constraints with the optimum extraction sequence suggested by pit optimization results presented previously.

The phases and direction of extraction allow for multiple benches on multiple elevations with a sump always available for pit dewatering. This means that during periods of heavy rainfall, perched benches will be available for extraction.

Once the phases have been designed, solid triangulations are created for each phase as they cut into topography from previous phases. These solid phases are then shelled (cut) on a 5 m lift height that corresponds to one block model subblock. These shells form a bench within each phase and represent the basic unit that is scheduled for the LoM production plan.

Table 13-5 details the phase inventory that formed the basis of the LoM production schedule.

Table 13-5: Phase Inventory (June 30, 2020 to End of Mine Life)*

Phase ID	Total (Mt)	Ore (Mt)	Waste (Mt)	Inferred Waste (Mt)	Li_2O% Diluted	Fe_2O_3%	MY%	Concentrate (Mt)
PH_01	2.9	2.6	0.3	0.0	3.36	0.6	46.9%	1.2
PH_02	3.0	2.3	0.6	0.1	2.25	1.3	27.8%	0.6
PH_03	36.9	17.8	17.9	1.2	2.05	1.2	24.8%	4.4
PH_04	2.0	1.7	0.3	0.0	2.37	1.3	29.9%	0.5
PH_05	2.8	2.0	0.7	0.1	2.31	0.8	29.0%	0.6
PH_06	100.6	29.7	70.1	0.7	2.31	1.1	28.9%	8.6
PH_07	97.4	24.8	70.9	1.7	1.95	1.2	23.1%	5.7
PH_08	86.0	14.1	70.2	1.7	1.80	1.1	20.8%	2.9
PH_09	23.1	4.2	18.4	0.6	1.95	1.2	23.6%	1.0
PH_10	127.0	21.6	102.5	2.9	1.52	1.3	16.7%	3.6
PH_11	115.5	17.5	95.5	2.4	1.71	1.1	19.5%	3.4
TOTAL	597.2	138.3	447.3	11.5	1.97	1.1	23.6%	32.6

Source: SRK, 2021
*Does not include approximately 4.6 Mt of ore in stockpiles as of June 30, 2021.
*MY% may not match mill feed schedule due to different plant recoveries

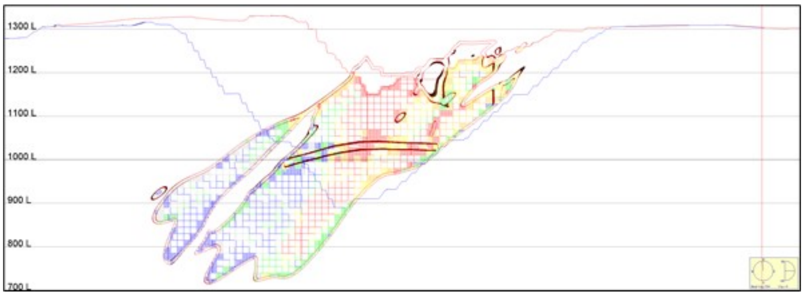
13.4 Mining Dilution and Mining Recovery

Based on reconciliation data for prior resource block models, the Greenbushes operation has historically applied a 95% grade factor and 100% mining recovery to the mineral reserves. The 95% grade factor was intended to account for, among other things, external dilution introduced by the mining process.

The new SRK resource block model includes 2.7% internal dilution for all Indicated resource subblocks (5 m by 5 m by 5 m) inside the reserves pit. In addition to this internal dilution, SRK has applied 20% external dilution and 80% mining recovery to all blocks that fall on the ore/waste contact (“perimeter blocks”). The perimeter blocks are represented by the 3 to 5 m wide halo depicted in Figure 13-5.

Perimeter blocks make up approximately 16% of the total mineral reserve. The remainder of the blocks (non-perimeter blocks) have no external mining dilution applied and are assigned 100% mining recovery.

SRK is of the opinion that these mining dilution and mining recovery adjustments are appropriate for the conversion of Indicated mineral resources to Probable mineral reserves.



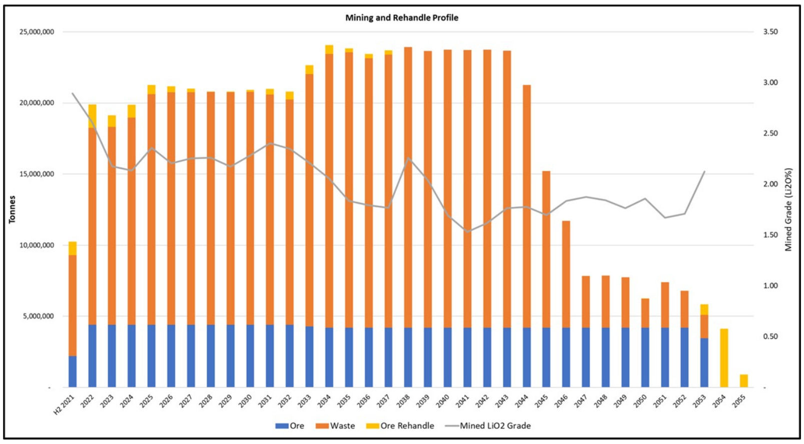
Source: SRK, 2020

Figure 13-5: Greenbushes Dilution and Mining Recovery Edge Effect

13.5 Production Schedule

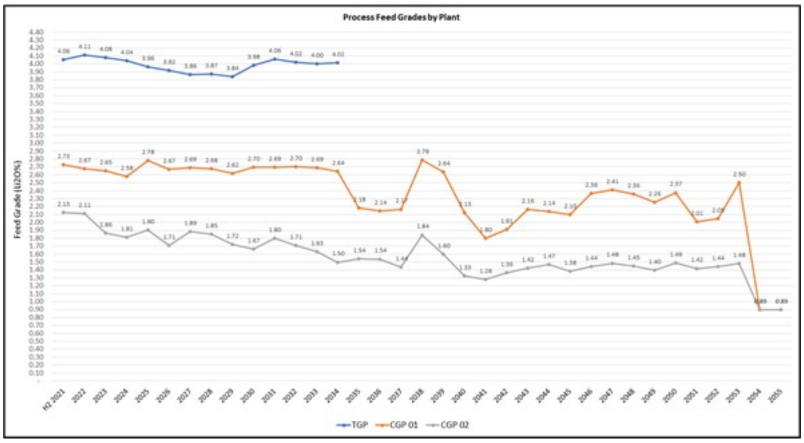
The LoM production is inherently forward-looking and relies upon a variety of technical and macroeconomic factors that will change over time and therefore is regularly subject to change. The schedule is based on June 30, 2021 pit topography and the mine was scheduled on a quarterly basis for the full LoM timeframe. Bench sinking rates were limited to ten benches per phase per year.

Figure 13-6 through Figure 13-10 show the mine and mill metrics on a yearly basis.



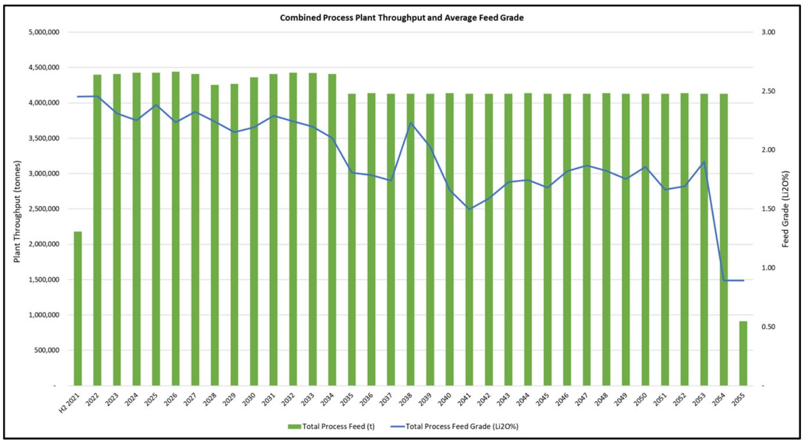
Source: SRK, 2021

Figure 13-6: Mining and Rehandle Profile



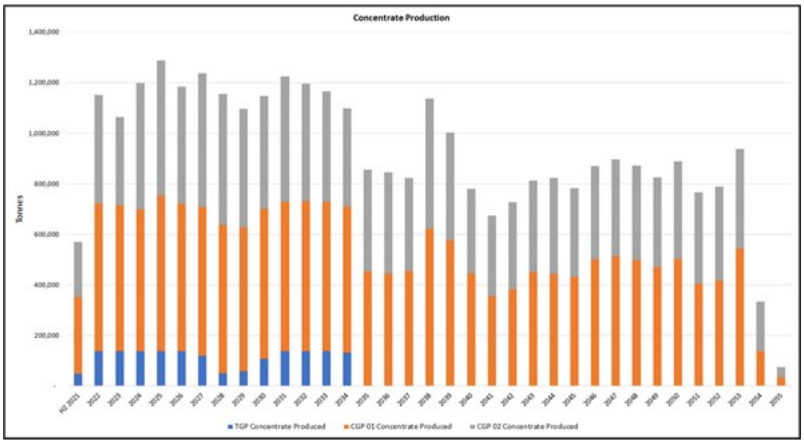
Source: SRK, 2021

Figure 13-7: Feed Grade by Plant



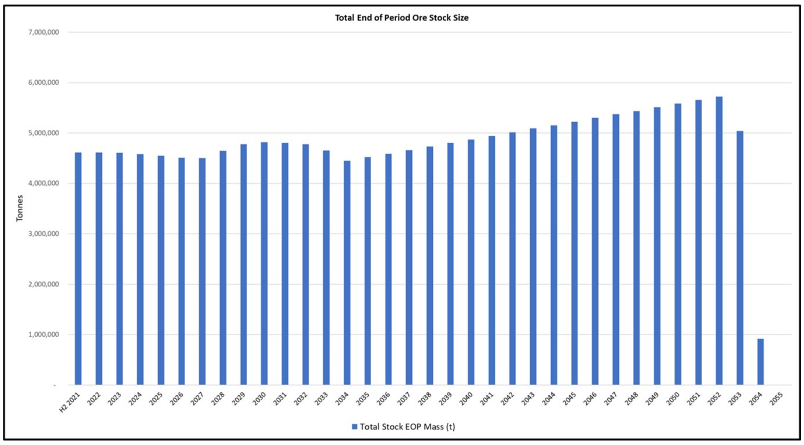
Source: SRK, 2021

Figure 13-8: Combined Process Plant Throughput and Grade (TGP, CGP1 and CGP2)



Source: SRK, 2021

Figure 13-9: Concentrate Production by Plant (TGP, CGP1 and CGP2)



Source: SRK, 2021

Figure 13-10: Long-Term Ore Stockpile Size

The LoM production schedule is detailed in Table 13-6.

Table 13-6: LoM Production Schedule -Expit and Mill concentrate production

		1-Jul-21	1-Jan-22	1-Jan-23	1-Jan-24	1-Jan-25	1-Jan-26	1-Jan-27	1-Jan-28	1-Jan-29	1-Jan-30	1-Jan-31	1-Jan-32	1-Jan-33	1-Jan-34	1-Jan-35	1-Jan-36	1-Jan-37	1-Jan-38	1-Jan-39	1-Ja
In-Pit RoM Summary	**Total**	**31-Dec-21**	**31-Dec-22**	**31-Dec-23**	**31-Dec-24**	**31-Dec-25**	**31-Dec-26**	**31-Dec-27**	**31-Dec-28**	**31-Dec-29**	**31-Dec-30**	**31-Dec-31**	**31-Dec-32**	**31-Dec-33**	**31-Dec-34**	**31-Dec-35**	**31-Dec-36**	**31-Dec-37**	**31-Dec-38**	**31-Dec-39**	**31-**
RoM (t)	**138,146,761**	2,200,000	4,400,000	4,400,000	4,400,000	4,400,000	4,400,000	4,400,000	4,400,000	4,400,000	4,400,000	4,400,000	4,400,000	4,300,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,20
RoM Li_2O (%)	**1.97**	2.82	2.54	2.13	2.06	2.26	2.14	2.19	2.20	2.11	2.20	2.34	2.30	2.15	1.99	1.76	1.75	1.70	2.21	2.01	
Total RoM WRCP (%)	**1.30%**	10.05%	8.60%	0.92%	0.95%	1.68%	1.59%	0.62%	1.13%	1.33%	2.91%	4.12%	4.21%	2.46%	1.17%	0.24%	0.16%	0.62%	0.89%	0.21%	0
Starting RoM Stockpile Summary																					
RoM (t)	**4,593,931**	4,593,931																			
RoM Li_2O (%)	**1.54**	1.54																			
Total RoM WRCP (%)	**16.92%**	16.92%																			
Total RoM MIN_REC (%)	**100%**	100%																			
Total RoM DIL_PERC (%)	**100%**	100%																			
Tech Grade	**1,610,624**	48,432	137,000	137,000	137,000	137,000	137,000	119,172	49,921	58,662	107,255	137,000	137,000	137,000	131,183	-	-	-	-	-	
Chemical Grade 01	**17,014,432**	303,118	585,835	578,828	560,874	617,107	585,048	590,475	588,542	569,134	592,652	591,402	594,540	592,160	579,427	453,111	444,852	455,611	621,114	576,825	44
Chemical Grade 02	**13,672,738**	219,029	429,216	348,797	500,303	534,559	461,771	528,352	517,121	468,235	447,437	496,848	464,827	436,407	386,999	401,887	401,493	367,590	516,420	426,655	33
Chemical Grade Total	**30,687,170**	522,147	1,015,051	927,626	1,061,177	1,151,666	1,046,820	1,118,827	1,105,664	1,037,369	1,040,089	1,088,250	1,059,367	1,028,567	966,426	854,998	846,345	823,201	1,137,534	1,003,480	77

		1-Jan-41	1-Jan-42	1-Jan-43	1-Jan-44	1-Jan-45	1-Jan-46	1-Jan-47	1-Jan-48	1-Jan-49	1-Jan-50	1-Jan-51	1-Jan-52	1-Jan-53	1-Jan-54	1-Jan-55
In-Pit RoM Summary	**Total**	**31-Dec-41**	**31-Dec-42**	**31-Dec-43**	**31-Dec-44**	**31-Dec-45**	**31-Dec-46**	**31-Dec-47**	**31-Dec-48**	**31-Dec-49**	**31-Dec-50**	**31-Dec-51**	**31-Dec-52**	**31-Dec-53**	**31-Dec-54**	**31-Dec-55**
RoM (t)	**138,146,761**	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	4,200,000	3,446,761	-	-
RoM Li_2O (%)	**1.97**	1.49	1.58	1.72	1.73	1.67	1.81	1.85	1.81	1.74	1.84	1.65	1.68	2.10	-	-
Total RoM WRCP (%)	**1.30%**	0.08%	0.07%	0.15%	0.10%	0.09%	0.12%	0.10%	0.07%	0.06%	0.20%	-	0.11%	1.15%	-	-
Starting RoM Stockpile Summary																
RoM (t)	**4,593,931**															
RoM Li_2O (%)	**1.54**															
Total RoM WRCP (%)	**16.92%**															
Concentrate Production Summary																
Tech Grade	**1,610,624**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chemical Grade 01	**17,014,432**	357,046	383,461	450,026	443,387	431,398	501,172	512,134	498,918	470,741	502,451	404,420	416,347	544,392	137,901	34,003
Chemical Grade 02	**13,672,738**	317,452	343,959	363,571	380,569	350,809	369,788	384,037	372,327	354,704	386,620	362,465	371,675	392,237	195,143	39,796
Chemical Grade Total	**30,687,170**	674,498	727,420	813,596	823,956	782,207	870,960	896,171	871,245	825,446	889,071	766,885	788,022	936,629	333,044	73,799

Notes:
Expit tonnes and grade excluding stockpile handling.
WRCP is mass yield.
Source: SRK 2021

Bench Sinking Rate

Table 13-7 shows the benches mined from each pit/phase on an annual basis. In SRK’s opinion, the sinking rate is reasonable.

Table 13-7: LoM Yearly Bench Sinking Rates (Number of 10-m-High Benches Mined per Phase per Year)

Year	PH_01	PH_02	PH_03	PH_04	PH_05	PH_06	PH_07	PH_08	PH_09	PH_10	PH_11
2021	4.7	3.0	4.1	-	2.8	4.0	2.0	-	-	-	-
2022	2.3	2.0	2.4	1.0	0.2	3.1	-	-	-	-	-
2023	-	-	2.1	2.3	-	2.1	2.2	-	-	-	-
2024	-	-	2.3	0.7	1.2	0.9	2.8	1.0	-	-	-
2025	-	-	1.6	1.0	2.8	1.5	2.0	-	-	-	-
2026	-	-	0.7	-	-	2.9	0.9	1.0	-	-	-
2027	-	-	0.9	-	-	2.0	0.2	4.0	-	-	-
2028	-	-	1.1	-	-	1.4	0.9	2.8	-	-	-
2029	-	-	1.4	-	-	1.0	1.8	2.2	-	-	-
2030	-	-	2.9	-	-	0.6	0.6	2.0	3.0	5.0	-
2031	-	-	1.3	-	-	1.7	-	-	5.0	2.3	-
2032	-	-	-	-	-	1.9	0.6	1.0	0.3	1.7	-
2033	-	-	1.0	-	-	1.5	2.0	2.0	0.7	0.5	-
2034	-	-	1.0	-	-	0.8	2.0	1.4	4.2	0.1	-
2035	-	-	-	-	-	-	5.2	1.5	0.8	-	-
2036	-	-	-	-	-	-	1.7	3.3	-	1.6	-
2037	-	-	-	-	-	0.5	0.1	2.4	-	2.5	3.0
2038	-	-	2.0	-	-	4.0	0.0	-	1.0	-	6.4
2039	-	-	-	-	-	-	1.7	-	2.0	0.2	4.6
2040	-	-	-	-	-	-	0.4	-	0.7	2.4	2.6
2041	-	-	-	-	-	-	0.2	1.4	0.3	2.3	2.4
2042	-	-	-	-	-	-	0.6	-	1.0	2.8	3.0
2043	-	-	-	-	-	-	1.3	-	-	2.9	3.0
2044	-	-	-	-	-	1.0	0.9	1.0	-	2.7	2.4
2045	-	-	-	-	-	-	0.5	2.1	-	2.0	1.6
2046	-	-	-	-	-	1.0	1.4	0.9	-	1.0	1.8
2047	-	-	-	-	-	-	0.9	2.4	-	0.9	0.2
2048	-	-	-	-	-	-	1.2	1.6	-	2.1	0.3
2049	-	-	-	-	-	-	1.8	1.4	-	1.0	1.6
2050	-	-	-	-	-	-	1.0	5.6	-	-	1.3
2051	-	-	-	-	-	-	-	-	-	-	2.7
2052	-	-	-	-	-	-	-	-	-	-	3.1
2053	-	-	-	-	-	-	-	-	-	-	6.0

Source: SRK 2021

13.6 Waste Dump Design

The current waste dump design has a final slope angle of 12 to 13° overall. This is to support concurrent reclamation to final configuration.

SRK has designed the waste dump to match the waste volumes in the LoM production schedule. Table 13-8 shows the volumetrics including the 27% compacted swell factor. Figure 12-5 in Section 12 of this report shows the final waste dump design and location in relation to the open pit. In the future it is possible that part of the waste dump will need to be relocated due to potential additional resources within its footprint.

Table 13-8: Waste Dump Capacities by Bench (10-m-High Lifts)

Toe Elevation (m)	Loose Cubic Meters (27% Swell Factor Compacted)
1,220	251,798
1,230	2,013,857
1,240	6,274,229
1,250	13,516,960
1,260	23,992,646
1,270	29,076,408
1,280	30,316,179
1,290	27,609,588
1,300	26,783,340
1,310	27,302,738
1,320	23,476,876
Total	210,614,619

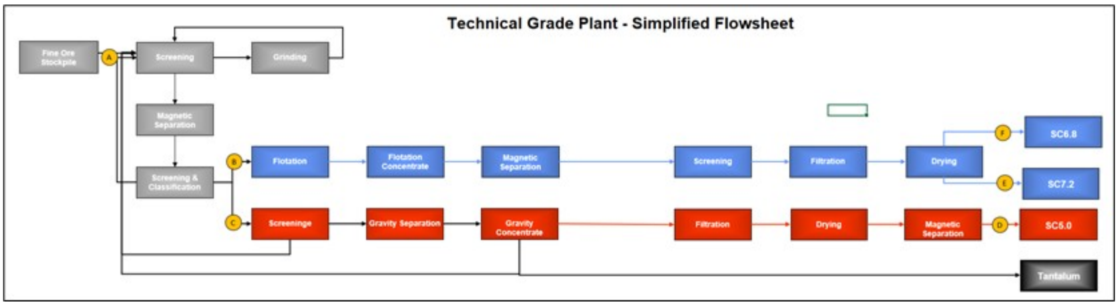
Source: SRK 2020

14 Processing and Recovery Methods

Greenbushes currently has two ore crushing facilities (CR1 and CR2) and three ore processing plants which includes the Technical Grade Plant (TGP), Chemical Grade Plant-1 (CGP1) and Chemical Grade Plant-2 (CGP2) with a nominal capacity of 4.5 Mt/y of pegmatite feed to produce a nominal 1.3 Mt/y of spodumene concentrates (chemical and technical grades). This section provides a discussion of the operation and performance of the crushing facilities, TGP, CGP1 and CGP2.

14.1 Technical Grade Plant (TGP)

TGP is a relatively small plant that processes approximately 350,000 t/y of ore at an average grade of about 3.8% Li_2O and produces about 150,000 t of spodumene concentrate products. The TGP produces a variety of product grades identified as SC7.2, SC6.8, SC5.5 and SC5.0 (specifications for each grade are presented in Section 14-7). There are two sub-products for SC7.2 designated as Premium and Standard, and these products carry the SC7.2P and SC7.2S designation. TGP can be operated in two different production configurations as shown in Figure 14-1. When operating in configuration 1 TGP produces SC7.2, SC6.8 and SC5.0 products. Configuration-1 can be split into two subsets, producing either SC7.2P or SC7.2S. When operating in configuration-2, the coarse processing circuit (SC5.0 circuit) is bypassed and the TGP produces only SC6.5 and SC6.8 products. All products, with the exception of SC6.8 are shipped in 1,000 kg bags or in bulk. SC6.8 is shipped only in 1,000 kg bags.



Source: Greenbushes 2020
Blue Represents Configuration-1 and Blue + Red Represents Configuration 2

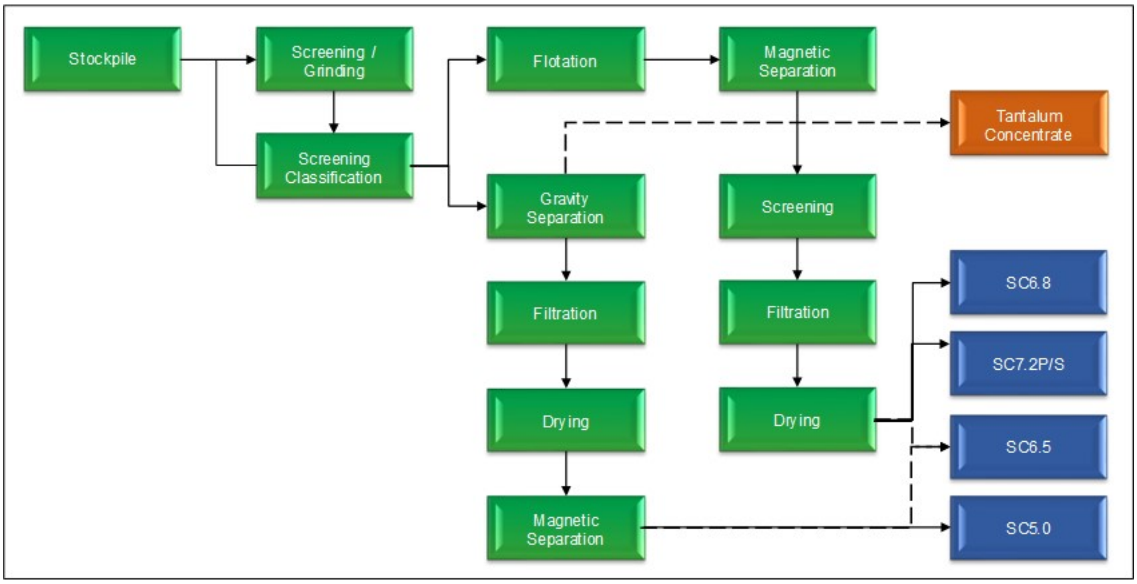
Figure 14-1: Simplified TGP Flowsheet

TGP has a current maximum sustainable feed rate of 50 dry tonnes per hour if maximum production for SC5.0 is required (configuration 1) and a maximum feed rate of 35 dry tonnes per hour if the SC5.0 circuit is off-line (configuration 2).

Feed to TGP is defined primarily by Li_2O grade and the iron grade that will achieve the final product iron quality specification for SC7.2. The iron grade for the plant feed is governed by mineralogy and is modelled using oxides of manganese, calcium, potassium, sodium and lithium in plant feed.

The TGP process flowsheet is shown in Figure 14-2 and incorporates the following unit operations:

- Crushing
- Grinding
- Classification
- Flotation
- Magnetic separation
- Filtration
- Drying



Source: Greenbushes, 2022

Figure 14-2: TGP Process Flowsheet

14.1.1 Grinding and Classification Circuit

TGP feed is blended with a front-end loader and fed by conveyor to a primary screen. Oversize from the screen is fed into a ball mill with the ball mill discharge reporting back to the primary screen fitted with a 3 mm screen. The +3 mm screen fraction is returned to the ball mill and the -3 mm fraction is subjected to low intensity magnetic separation to remove iron mineral contaminants, which are discarded to tailings. The nonmagnetic fraction is screened at 0.7 mm with Derrick Stacksizers. The -3 mm +0.7 mm fraction is recirculated back to the grinding circuit and the -0.7 mm fraction is advanced to the hydraulic classification circuit. The classifier underflow is processed in the coarse processing circuit and the classifier overflow is advanced to the fine processing circuit.

14.1.2 Coarse Processing Circuit

The coarse classifier underflow is advanced to the coarse processing circuit where it is first deslimed and then processed through a spiral gravity circuit to produce a rougher tantalum gravity concentrate that is further upgraded on shaking tables to produce a final tantalum gravity concentrate. The gravity circuit tailings are screened at 0.8 mm on a safety screen and then dewatered with hydrocyclones and filtered on a horizontal belt filter to produce the SC5.0 product (glass grade product). The SC5.0 product is then dried in a fluid bed dryer and then subjected to a final stage of magnetic separation to remove any remaining iron contaminants. The final SC5.0 product is then conveyed to a 180 t storage silo pending packaging and shipment. It should be noted that the coarse processing circuit is operated only to fill market demand for the SC5.0 product and can be bypassed when SC5.0 production is not required.

14.1.3 Fines Processing Circuit

The classifier overflow is advanced to the fines processing circuit where it is first deslimed and then subjected to two stages of reagent conditioning prior to spodumene rougher flotation. The spodumene rougher flotation concentrate is further upgraded with two stages of cleaner flotation. The spodumene cleaner flotation concentrate is then attritioned and processed through both low intensity magnetic separation and wet high intensity magnetic separation (WHIMS) to remove iron mineral contaminants. The nonmagnetic spodumene concentrate is filtered on a horizontal belt filter and then dried in a fluid bed drier. Dried concentrate from the lower portion of the fluid bed drier is final SC7.2 product which is conveyed to a 250 t storage silo pending packaging and shipment. The fine fraction that discharges from the upper portion of the fluid bed drier is classified in an air classifier. The classifier underflow is the SC6.8 product, which is conveyed to a storage silo. The air classifier overflow is captured in a baghouse and subsequently recycled back to the process.

14.1.4 Control Philosophy

A process control system (PCS) provides an operator interface with the plant and equipment. A programmable logic controller (PLC) and operator workstations communicate over a fiber optic Ethernet link, and are linked to the workstations in CGP1. The PCS controls the process interlocks, and PID control loop set-point changes are made at the operator interface station (OIS). Local control stations are located in the field proximal to the relevant drives. The OISs allow drives to be selected to local or remote via the drive control popup. Statutory interlocks such as emergency stops are hardwired and apply in all modes of operation.

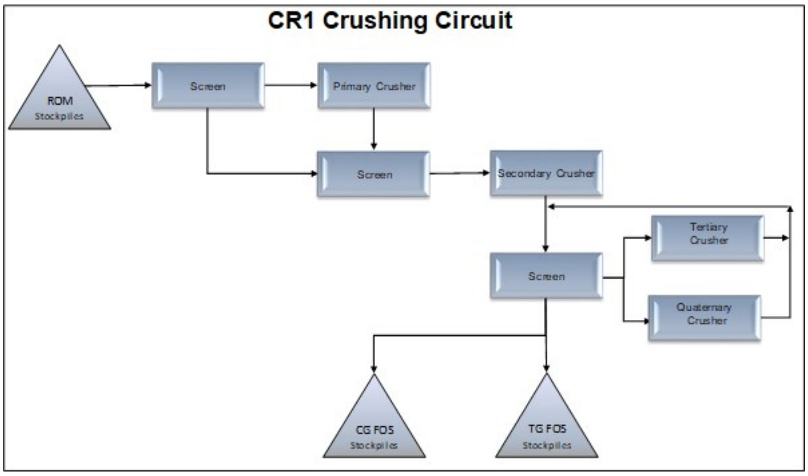
14.2 Chemical Grade Plant-1 Crushing and Processing Plants

The Chemical Grade Plant-1 (CGP1) process flowsheet includes the following major unit operations to produce chemical grade spodumene concentrates:

- Crushing
- Grinding and classification
- Heavy media separation
- WHIMS
- Coarse mineral flotation
- Regrinding
- Regrind coarse mineral flotation
- Fine mineral flotation
- Concentrate filtration
- Final tailings thickening and storage at the TSF

14.2.1 Crushing Circuit (CR1)

CR1 provides crushed ore to both the TGP and CGP1. The CR1 flowsheet is shown in Figure 14-3. RoM ore is delivered from the mine to the RoM storage bin. Ore is drawn from the RoM bin using a variable speed plate feeder that feeds a vibrating grizzly with bars spaced at 125 mm. The +125 mm grizzly oversize fraction reports to a Metso C160 primary jaw crusher, where it is crushed before recombining with the -125 mm grizzly undersize on the crusher discharge conveyor. The crusher discharge conveyor conveys the crushed ore to a second vibrating grizzly. The grizzly oversize fraction is fed to the secondary crusher. The grizzly undersize fraction and the secondary crusher discharge are combined and then conveyed to a double-deck banana screen. The oversize from the top deck is conveyed to a tertiary cone crusher which is operated in closed circuit with the banana screen. The oversize from the bottom deck is conveyed to two quaternary cone crushers which are also operated in closed circuit with the banana screen. The -12 mm bottom deck screen undersize is the final crushed product, which is conveyed to a 4,200 t (live capacity) fine ore stockpile (FOS). A weightometer is installed ahead of the FOS feed conveyor to monitor and record the crushing plant production rate and overall tonnage of crushed ore delivered to the FOS. The crushing circuit is controlled from a dedicated LCR located within the main crushing building.

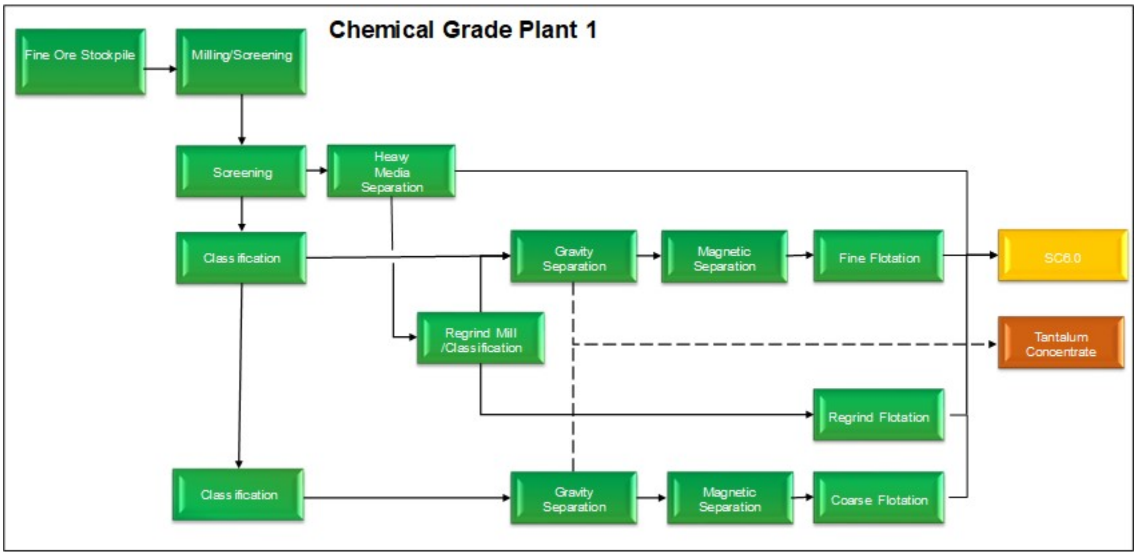


Source: Greenbushes, 2022

Figure 14-3: CR1 Crushing Plant Flowsheet

14.2.2 Chemical Grade Plant-1 (CGP1)

CGP1 was designed to process ore at the rate of 2 Mt/y of crushed ore and currently produces about 535 kt/y of spodumene concentrate grading 6% Li_2O from ore containing about 2.5% Li_2O. CGP1 produces concentrates from heavy medium separation (HMS), coarse flotation and fine flotation circuits which are combined as a single product. A simplified flowsheet for CGP1 is shown in Figure 14-4.



Source: Greenbushes, 2021

Figure 14-4: CGP1 Process Flowsheet

Grinding and Classification

Plant feed is conveyed to the grinding circuit and is first screened at 2 mm on the primary vibrating screen. The +2 mm fraction feeds a 3.6 m diameter by 4.06 m long ball mill which is operated in closed circuit with the primary screen. The -2 mm ground product is then advanced to the primary screening circuit that consists of four five-deck Derrick Stacksizers. The Stacksizers serve to classify the ground ore into four size fractions. The -2 mm + 600 μm fraction is processed in the HMS circuit, the -600 μm +200 μm fraction is processed by WHIMS followed by coarse flotation, and the -200 μm + 45 μm fraction is processed by WHIMS followed by fine flotation. The -45 μm fraction is too fine to process and is disposed of in the TSF. The -600 μm +200 μm and the -200 μm + 45 μm fractions may also be processed a series of spirals and wet table for tantalum recovery with the spiral tailings being fed to high intensity magnets, however, tantalum processing and recovery are not the focus of this review and will not be discussed.

HMS Circuit

The -2 mm +600 μm size fraction is processed in an HMS cyclone at a slurry feed specific gravity of about 2.55 which is adjusted with ferrosilicon to the correct specific gravity. The high specific gravity sink product is then processed through WHIMS to remove iron contaminants. The nonmagnetic fraction is finished concentrate and is screened and washed to remove residual ferrosilicon and then filtered on a horizontal vacuum filter. The HMS float product is advanced to the regrind circuit for further processing.

WHIMS and Coarse Flotation

The -600 μm +200 μm fraction is processed by WHIMS to remove magnetic contaminants. The magnetic fraction is waste and sent to the TSF thickener. The nonmagnetic fraction is classified into coarse and very coarse fractions which are processed in separate flotation circuits to recover spodumene flotation concentrates, which are then filtered on horizontal vacuum filters as finished concentrate. The tailings from both the coarse and very coarse flotation circuits are advanced to the regrind circuit for further processing.

WHIMS and Fine Flotation

The -200 μm +45 μm fraction is processed by WHIMS to remove magnetic contaminants. The magnetic fraction is waste and sent to the tailing thickener and then to the TSF. The nonmagnetic fraction is processed in a fine flotation circuit to recover spodumene flotation concentrate, which is then filtered as finished concentrate. The fine flotation tailing is waste and is sent to the tailing thickener and then to the TSF.

Regrinding and Regrind Flotation

The HMS float product and coarse and very coarse flotation tailings are reground and then classified into two size fractions. The -450 μm +250 μm fraction is processed in the regrind flotation circuit to produce a finished flotation concentrate which is then filtered and stockpiled in the concentrate storage bin. The regrind flotation tailing is recycled back to the regrind ball mill. The -250 μm +45 μm fraction is processed in the fine flotation circuit. The fine flotation concentrate is filtered and sent to the concentrate storage bin. The fine flotation tailing is a waste product which is thickened and disposed of in the TSF.

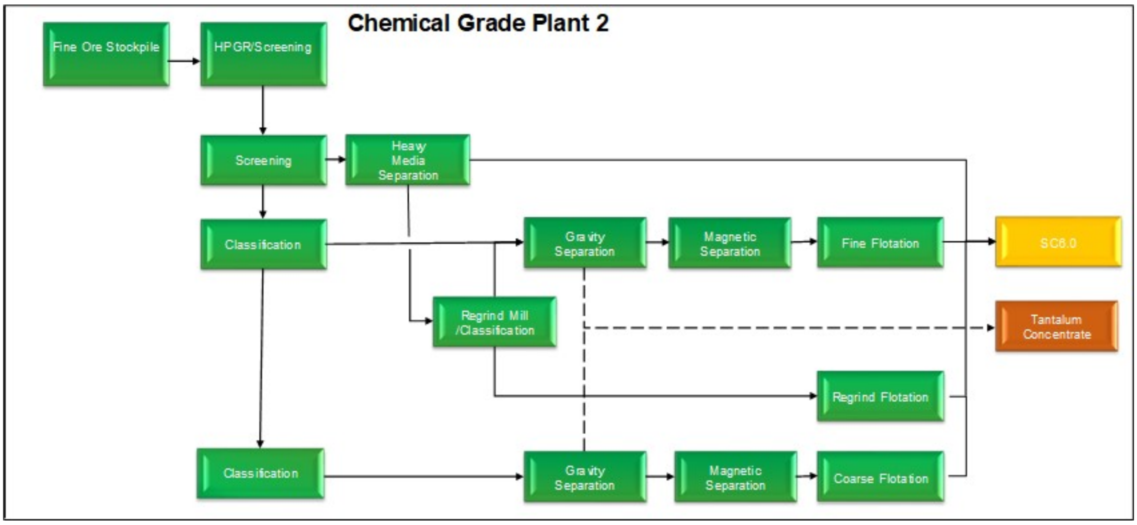
Tailings Thickening

Tailings are thickened and the thickener underflow is pumped to the TSF and thickener overflow is recycled as process water back to the process.

14.3 Chemical Grade Plant-2 Crushing and Processing Plants

Crushing plant-2 (CR2) is a new crushing facility that was commissioned during 2019 and 2020 to provide crushed ore to CGP2. CGP2 is a new chemical grade processing plant that was commissioned during 2019 and 2020. CGP2 was designed to process 2.4 Mt/y of ore at an average grade of 1.7% Li_2O to produce final concentrates containing greater than 6% Li_2O and meet the specification for Greenbushes' SC6.0 product. The flowsheet is very similar to CGP1 but was designed with a number of modifications based on HPGR (high pressure grinding rolls) comminution studies and CGP1 operational experience. A schematic flowsheet for CGP2 is shown in Figure 14-5. The most notable modifications include:

- Replacement of the ball mill grinding circuit with HPGRs
- Plant layout to simplify material flow and pumping duties
- Orientation of the HMS circuit to allow the sinks and floats products to be conveyed to the floats WHIMS circuit and sinks tantalum circuit
- Locating the coarse flotation circuits above the regrind mill to allow flow steams to gravity feed directly into the mill
- Orientation of the fines flotation cells in a staggered arrangement to allow the recleaner and cleaner flotation tails to flow by gravity into the cleaner and rougher cells, respectively.
- Orientation of the concentrate filtration circuit to allow the sinks to be conveyed to the sinks filter.
- Provision for sufficient elevation for the deslime and dewatering cyclone clusters to gravity feed to the thickener circuits located at ground level



Source: Greenbushes, 2019

Figure 14-5: CGP2 Process Flowsheet

14.3.1 Crushing Plant-2 (CR2)

Ore is crushed to 80% passing (P80) 25 mm in a two-stage crushing circuit with a nominal feed capacity of 500 t/h, sufficient to crush 2.4 Mt/y on a 4,800 hr/year schedule, which allows for additional crushing capacity if it is needed. RoM ore is truck-hauled to the RoM pad and is stored next to the RoM bin in separate stockpiles of varying ore types and grades to facilitate blending of the feed into the crushing plant.

The RoM bin is fed from the various ore stockpiles with a front-end loader and is protected by a grizzly with bars on a 670 mm spacing. A dedicated rock breaker is provided to break grizzly oversize material. Feed to the RoM bins is controlled by a “dump–no dump” traffic signal mounted on the RoM pad adjacent to the RoM bin. The traffic signal is controlled by a level sensor mounted above the RoM bin and by the crusher operator.

Ore is drawn from the RoM bin using a variable speed apron feeder which feeds a vibrating grizzly with grizzly bars on a 100 mm spacing. The +100 mm grizzly oversize fraction reports to a Metso C160 primary jaw crusher, where it is crushed and combined with the grizzly undersize on the crusher discharge conveyor.

The primary crushed ore is then screened on a double-deck banana screen. The screen oversize fractions are conveyed to the secondary feed bin which feeds the secondary cone crusher. The undersize fraction (P80 25 mm) is conveyed to the fine ore stockpile ahead of the HPGR circuit. The fine ore stockpile has a “live” capacity of 7,200 t and total capacity of approximately 56,000 t. A weightometer is installed ahead of the fine ore stockpile to monitor and record the crushing plant production rate and overall tonnage of crushed ore delivered to the fine ore stockpile. The crushing circuit is controlled from a dedicated LCR controller located within the main crushing building.

14.3.2 Chemical Grade Plant-2 (CGP2)

HPGR Circuit

The HPGR circuit is fed from the fine ore stockpile by a single reclaim conveyor and conveyed to HPGR feed bins via a series of transfer conveyors. Two HPGRs are installed in a duty/standby configuration. HPGR feed rate is measured by a weightometer on the HPGR feed transfer conveyor and is controlled to a set-point by independently varying the speed of the reclaim feeders. The HPGR product reports to the primary screens where the ore is separated into screen undersize, which enters the wet plant, and oversize which is recycled back to the HPGR. The HPGR circuit serves to crush the ore to -3 mm prior to processing in CGP2

Plant Feed Preparation

The -3 mm HPGR product is advanced to the primary screening circuit that consists of five-deck Derrick Stack Sizers. The stack sizers serve to screen the HPGR product into four size fractions. The -3 mm + 600 µm fraction is processed in the HMS circuit, the -600 µm +250 µm fraction is processed by WHIMS in the coarse flotation circuit and the -250 µm +45 µm fraction is processed by WHIMS followed by fine flotation. The -45 µm fraction is too fine to process and is disposed of in the TSF. The -600 µm +250 µm and the -250 µm +45 µm fractions may also processed through a series of spirals and wet tables for tantalum recovery with the spiral tailings being fed to high intensity magnets, however, tantalum processing and recovery will not be discussed in this review.

HMS Circuit

The -3 mm +600 µm size fraction is processed in an HMS cyclone at a slurry feed specific gravity of about 2.55, which is adjusted with ferrosilicon to the correct specific gravity. The HMS sink product is further processed by WHIMS. The nonmagnetic WHIMS product is finished concentrate and is screened and washed to remove residual ferrosilicon and then filtered on a horizontal vacuum filter. The HMS float product is advanced to the regrind circuit for further processing.

WHIMS and Coarse Flotation

The -600 µm +250 µm fraction is processed by WHIMS to remove iron contaminants. The magnetic fraction is waste and sent to the TSF thickener. The nonmagnetic fraction is classified into coarse and very coarse fractions which are processed in separate flotation circuits to recover spodumene flotation concentrates. The flotation concentrates are filtered on horizontal vacuum filters and stockpiled in the concentrate storage bin. The tailings from both the coarse and very coarse flotation circuits are advanced to the regrind circuit for further processing.

Regrinding and Regrind Flotation

The HMS float product and the coarse and very coarse flotation tailings are reground and then classified into two size fractions. The -500 µm +250 µm fraction is processed in the regrind flotation circuit to produce a finished flotation concentrate which is then filtered and stockpiled in the concentrate storage bin. The regrind flotation tailing is recycled back to the regrind ball mill. The -250 µm +45 µm fraction is processed in the fine flotation circuit.

WHIMS and Fine Flotation

The -250 µm +45 µm fraction is processed by WHIMS to remove iron contaminants. The magnetic fraction is waste and sent to the tailing thickener and then to the TSF. The nonmagnetic fraction is processed in a fine flotation circuit to recover spodumene flotation concentrate, which is then filtered as finished concentrate. The fine flotation tailing is waste and is sent to the tailing thickener and then to the TSF.

Tailings Thickening

Tailings are thickened and the thickener underflow is pumped to the TSF and thickener overflow is recycled as process water back to the process.

14.4 CGP1 and CGP2 Mass Yield and Recovery Projection

Greenbushes has developed mass yield models for both CGP1 and CGP2 which are used to predict concentrate mass yield and lithium recovery, based on ore grade, into concentrates containing 6% Li_2O. The mass yield models were developed from on an analysis of CGP1 plant performance at different feed grades. The yield model for CGP2 is based on the CGP1 yield model but includes provision for additional lithium recovery based on the use of HPGRs for plant feed comminution as opposed to ball mill grinding as practiced in CGP1. The provision for incrementally higher lithium recovery in CGP2 is based on a metallurgical evaluation conducted by Greenbushes and the expectation that fewer unrecoverable fines will be generated during comminution with an HPGR compared to ball mill grinding.

Predicted mass yield and lithium recoveries versus ore grade are shown Table 14-1 for both CGP1 and CGP2 (assuming final concentrate grade of 6% Li_2O). At the average planned feed grade of

2.5% Li_2O, the mass yield for CGP1 is estimated at 31.4% and lithium recovery is estimated at 75.2%. At the design feed grade of 1.7% Li_2O for CGP2 the mass yield for is estimated at 20.2% and lithium recovery is estimated at 71.5%.

Table 14-1: CGP1 and CGP2 Model Yield and Li_2O Recovery vs. Feed Grade

Feed Li_2O%	CGP1		CGP2	
	Yield (%)	Li_2O Recovery (%)	Yield (%)	Li_2O Recovery (%)
0.5	3.8	45.0	4.2	49.9
0.6	4.8	47.7	5.3	52.6
0.7	5.8	50.1	6.4	55.1
0.8	7.0	52.3	7.6	57.2
0.9	8.1	54.3	8.9	59.2
1.0	9.4	56.2	10.2	61.1
1.1	10.6	57.9	11.5	62.8
1.2	11.9	59.5	12.9	64.5
1.3	13.2	61.1	14.3	66.0
1.5	16.0	63.9	17.2	68.8
1.6	17.4	65.3	18.7	70.2
1.7	18.9	66.5	20.2	71.5
1.8	20.3	67.8	21.8	72.7
1.9	21.8	68.9	23.4	73.9
2.0	23.4	70.1	25.0	75.0
2.1	24.9	71.2	26.6	76.1
2.3	28.1	73.3	30.0	78.2
2.2	26.5	72.2	28.3	77.2
2.3	28.1	73.3	30.0	78.2
2.4	29.7	74.3	31.7	79.2
2.5	31.4	75.2	33.4	80.2
2.6	33.0	76.2	35.1	81.1
2.7	34.7	77.1	36.9	82.0
2.8	36.4	78.0	38.7	82.9
2.9	38.1	78.9	40.5	83.8
3.0	39.9	79.7	42.3	84.7

Source: Greenbushes and SRK, 2020

14.5 TGP Performance

TGP performance for the period 2017-2021 (Jan to Sept) is summarized in Table 14-2. During this period ore tonnes processed ranged from 232,055 to 373,643 t and ore grades ranged from 3.72 to 3.96% Li_2O. Overall lithium recovery ranged from 68.8 to 75.1% into six separate products (SC7.2-Standard, SC7.2-Premium, SC6.8, SC6.5, SC6.0 and SC5.0). Overall mass yield during this period ranged from 38.4 to 44.9%.

Table 14-2: Production Summary for TGP

CGP-1	2017	2018	2019	2020	2021 (Jan-Sep)
Feed Tonnes	343,760	363,462	373,643	232,055	264,371
Feed (Li_2O%)	3.96	3.93	3.75	3.72	3.86
Conc. Tonnes					
SC7.2 - Standard	42,063	56,919	56,387	37,470	32,500
SC7.2 - Premium	35,808	26,621	23,164	13,349	20,151
SC6.8	12,340	13,380	11,063	9,115	9,482
SC6.5	12,718	14,183	14,532	14,536	16,611
SC6.0	6,190	1,322	849	257	917
SC5.0	45,200	47,735	40,529	14,478	33,988
Total Conc.	154,319	160,160	146,524	89,205	113,649
Avg Conc Grade (Li_2O%)	6.62	6.64	6.68	6.94	6.56
Mass Yield (%)	44.9	44.1	39.2	38.4	43.0
Li_2O Recovery (%)	75.1	74.5	69.8	71.6	73.1

Source: Greenbushes, 2021

14.6 CGP1 Performance

The performance of CGP1 for the period 2016 to 2021 (Jan to Sep) is summarized in Table 14-3 Ore tonnes processed during this period ranged from 1.18 Mt to 1.82 Mt with ore grades ranging from 2.49 to 2.70% Li_2O. During 2020, 1.40 Mt of ore were processed at an average grade of 2.51% Li_2O with 74.9% of the contained lithium being recovered into concentrates averaging 6.06% Li_2O, representing a mass yield of 31.1%. During 2021 (Jan to Sep), 1.36 Mt of ore were processed at an average grade of 2.57% Li_2O. Lithium recovery averaged 75.2% into concentrates that averaged 6.07% Li_2O representing a mass yield of 32%. CGP1 plant performance is compared to Greenbushes' yield model for CGP1 in Table 14-4. Generally, Greenbushes CGP1 yield model provides 4a good prediction of plant performance.

Table 14-3: Summary of CGP1 Production

Year	Ore		Concentrate		Li_2O Recovery (%)		Yield (%)	
	Tonnes	Li_2O%	Tonnes	Li_2O%	Actual	Model	Actual	Model
2016	1,184,572	2.51	355,199	6.08	72.7	76.5	30.0	31.5
2017	1,652,259	2.46	492,151	6.04	73.2	75.5	29.8	30.7
2018	1,817,853	2.49	563,883	6.04	75.3	75.7	31.0	31.2
2019	1,659,148	2.70	565,438	6.05	77.0	77.1	34.1	34.6
2020	1,401,625	2.51	435,772	6.06	74.9	75.2	31.1	31.2
2021 (Jan- Sep)	1,362,294	2.57	435,722	6.07	75.2	75.9	32.0	32.7

Source: Greenbushes, 2021

Table 14-4: CGP1 Yield Model Prediction

Year	Actual Yield %	Model Yield %
2016	30.0	31.5
2017	29.8	30.7
2018	31.0	31.2
2019	34.1	34.6
2020	30.1	31.2
2021 (Jan-Sep)	32.0	32.7

14.7 CGP2 Performance

CGP2 commissioning began during September 2019 and continued through April 2020 and was then shut down and put on care and maintenance during the period of March 2020 to April 2021 due to market demand considerations. CGP2 was then put back into production during May 2021. CGP2 performance during 2020 (Jan to Apr) and 2021 (May to Sept) is summarized in Table 14-5 and compared with Greenbushes' yield model for CGP2.

During the 2020 plant commissioning period from January to April CGP2 processed 280,108 t of ore at an average grade of 2.19% Li_2O and recovered 52.9% of the lithium into 53,089 t of concentrate at an average grade of 6.10% Li_2O and 0.93% Fe_2O_3. Concentrate yield for this period averaged 18.9%. Although product quality specifications were achieved, lithium recovery and concentrate yield were substantially below target.

During 2021 (May to September), CGP2 processed 847,058 t of ore at an average grade of 2.00% Li_2O and recovered 51% of the lithium (versus a predicted recovery of 75%) into 145,230 t of concentrate at an average grade of 5.94% Li_2O and 1.01% Fe_2O_3. Concentrate yield for this period averaged 17.2% versus the model yield projection of 25%. Although, product quality specifications were generally achieved, lithium recovery and concentrate yield were substantially below target.

Table 14-5: Summary of CGP2 Production 2020 (Jan-Apr) and 2021 (May-Sept)

Year	Month	Ore		Concentrate			Li_2O Recovery (%)		Yield (%)	
		Tonnes	Li_2O%	Tonnes	Li_2O%	Fe_2O_3 %	Actual	Model	Actual	Model
2020	Jan	67,404	2.37	13,394	6.21	0.93	52.0	78.9	19.9	31.2
2020	Feb	64,302	2.16	11,393	5.96	0.93	49.3	76.7	17.7	27.6
2020	Mar	79,731	2.08	14,865	6.01	0.95	54.2	75.9	18.6	26.3
2020	Apr	68,671	2.15	13,437	6.21	0.92	56.3	76.6	19.5	27.5
Total/Avg	**2020**	**280,108**	**2.19**	**53,089**	**6.10**	**0.93**	**52.9**	**77.0**	**18.9**	**28.2**
2021	May	155,051	2.03	30,546	5.98	1.01	57.9	75.3	19.7	25.5
2021	June	148,981	1.94	23,268	5.79	1.06	46.6	74.3	15.6	24.0
2021	July	164,446	1.99	29,824	6.02	0.98	54.9	74.9	18.1	24.8
2021	Aug	193,138	2.03	29,786	6.01	1.03	45.6	75.3	15.4	25.5
2021	Sept	185,442	2.02	31,806	5.90	0.97	50.0	75.2	17.1	25.3
Total/Avg	**2021**	**847,058**	**2.00**	**145,230**	**5.94**	**1.01**	**51.0**	**75.0**	**17.2**	**25.0**

Source: Greenbushes, 2021

Greenbushes has continued to investigate CGP2 plant performance, and their metallurgical department issued a summary report during October 2021 which addressed efforts to identify the key problem areas in the plant. Metallurgical investigations included a review of the following process unit operations:

- HPGR particle size distribution
- Primary screen deck opening size
- Wet high intensity magnetic separation (WHIMS) performance
- Desliming cyclone performance
- Coarse flotation
- Fine flotation

An updated material balance indicated that lithium recovery in CGP2 was about 51% and lithium losses were about 49%. The source of the lithium losses were identified as occurring in the following areas:

- Desliming cyclones: 12%
- Flotation tailings: 17%
- Magnetic concentrates: 10%
- Other: 10%
- **Total Li_2O Losses: 49%**

14.7.1 Updated Yield Equation

Greenbushes metallurgical staff have developed a new yield equation for CGP2 based on actual performance during the period of 2019 to 2021. For purposes of financial modeling SRK has assumed that this updated yield equation will represent CGP2 production during the period 2023 to 2024 while Greenbushes works to resolve process issues related to CGP2. SRK assumes that these process issues will be resolved by Q1 2025 and from that point on CGP2 yield will be represented by the yield equation that has been established for CGP1. It is noted that the yield equation that had been previously established for CGP2 included a yield premium attributed to inclusion of the HPGR in the process flowsheet which SRK does not believe has been validated. It is further noted that CGP2 and CGP1 flowsheets for are similar and both plants process ore from the same mining operation, as such, SRK believes that it is reasonable to expect that CGP2 will eventually achieve design product targets but cautions that at this point design performance of CGP2 remains to be demonstrated and has not yet been confirmed.

14.7.2 CGP2 Process Performance Assessment

In order to further assess CGP2 performance issues, Greenbushes retained MinSol to undertake a performance assessment of CGP2 in November 2021 to provide a baseline for the current plant operating conditions versus design and to provide recommendations to optimize CGP2 performance with respect to concentrate grade and recovery. Following an initial plant survey, MinSol made the following key observations regarding CGP2 performance:

- The plant feed is finer than designed, and the variability in feed particle size distribution (PSD) and feed grade is directly impacting the plants performance and the metallurgical team's ability to troubleshoot and optimize.
- Process instrumentation, particularly density meters, are inaccurate and are impeding the operating and metallurgical team's ability to fully understand the mass balance, Li_2O recovery and Li_2O losses.
- Process split points (secondary screen, FBC1, FBC2, and Regrind FBC) are different from design, likely resulting in the following effects:
  - Higher deportment of solids to the fines WHIMS.
  - Coarser feed to the fine flotation circuit. Wider size distribution and coarser top size fed to the coarse flotation circuit.
- The rougher flotation tailing grade is higher than design, accounting for additional Li_2O losses. Based on the work completed to date, this likely will not be resolved by simple mechanical adjustments.

Based in this initial review, MinSol identified the following priority areas as a path forward to address CGP2 process performance:

- Undertake a comprehensive plant audit to better quantify the source and magnitude of recovery and losses.
- Engage instrument suppliers to rectify calibration and accuracy issues to enable plant balance and troubleshooting.
- Reduce the panel apertures on the secondary screen to allow subsequent reduction in primary stacksizer screen aperture to 600um per design.
- Modify the classifier split points per design to reduce load on fines WHIMS, increase coarse flotation feed and reduce the particle top size into the fines float.
- Undertake a detailed test program to assess the cause of high lithium losses during flotation
- Return the coarse thickener underflow back onto the process (currently a product stream that is directed to tailings).

14.8 Product Specifications

CGP1 and CGP2 are operated to produce a spodumene concentrate designated as SC6.0. The specification for SC6.0 is a minimum grade of 6% Li_2O and a maximum iron content of 1% Fe_2O_3. The moisture content is specified at 8% maximum (6% target) and there is no grain size specification. Greenbushes also produces a range of specialized spodumene concentrates in their technical grade plant. Table 14-6 provides a summary of the product specifications produced by Greenbushes.

Table 14-6: Greenbushes Lithium Product Specifications

Criteria	SC5.0	SC6.0	SC6.5	SC6.8	SC7.2 Std	SC7.2 Prem
Element (%)						
Li_2O	5 min	6 min	6.5 min	6.8 min	7.2 min	7.2 min
Fe_2O_3	0.13 max	1 max	0.25 max	0.20 min	0.12 max	0.12 max
Al_2O_3				24.5 min	25 min	25 min
SiO_2				63.5 min	62.5 min	62.5 min
Na_2O				0.50 max	0.35 max	0.35 max
K_2O				0.60 max	0.30 max	0.30 max
P_2O_5				0.50 max	0.25 max	0.25 max
CaO					0.10 max	0.10 max
LOI				0.70 max	0.5 max	0.5 max
Grain Size (µm)						
+1,000			<2%			
+850	0%					
+500					0%	0%
+212					18% max	18% max
+125				3% max		
+106	95%					
+75					60% min	60% min
-75				80% min		
Moisture (%)		8 max 6 target				

Source: Greenbushes, 2020

14.9 Process Operating Cost

Process operating costs for Greenbushes two crushing plant (CR-1 and CR-1), the TGP and the chemical grade plants (CGP1 and CGP2) are presented in this section.

14.9.1 Crushing Plant Operating Costs

Operating costs for CR1 and CR2 are summarized in Table 14-7. During 2020 and 2021 (Jan-Sept), CR1 operating costs were reported at AUS$6.45 and AUS$6.34/t and averaged AUS$6.40/t. CR2 operating costs were reported at AUS$12.71/t during 2020 and AUS$5.56/t during 2021. The higher CR2 operating cost during 2020 is attributed to contractor crushing costs and transitioning to the newly constructed CR2 crushing facility. CR2 operating costs reported for 2021 (Jan-Sept) are considered most indicative of operating cost going forward for this facility. CR1 provides crushed ore to both the TGP and to CGP1 and CR2 provides crushed ore to CGP2.

Table 14-7: Crushing Circuit Opex (CR1 And CR2)

Cost Area	CR1 (AUS$)		CR2 (AUS$)	
	2020	2021 (Jan-Sept)	2020	2021 (Jan-Sept)
Overhead	4,935,871	5,377,618	1,743,198	2,733,918
Employee Overhead	1,907,370	1,697,154	575,963	686,883
Feed Preparation	3,667,350	3,211,781	1,231,206	1,274,177
Ancillary Equipment	16,608	21,338	9,353	9,725
Safety	3,295	8,955	332	1,445
Total	**10,530,494**	**10,316,846**	**3,560,052**	**4,706,148**
Ore Tonnes Processed	1,633,679	1,626,666	280,008	847,058
AUS$/t Ore	**6.45**	**6.34**	**12.71**	**5.56**

Source: Greenbushes Foreman's Reports 2020 – 2021

14.9.2 TGP Operating Costs

TGP operating costs for 2020 and 2021 (Jan-Sept) are shown in Table 14-8. During 2020 TGP processing costs were reported at AUS$43.90/t ore processed and AUS$50.35/t inclusive of CR1 crushing costs. During 2021, processing costs were AUS$36.36/t ore processed and AUS$42.70/t inclusive of CR1 crushing costs. TGP processing costs averaged AUS$40.13/t during this period and averaged AUS$46.53 inclusive of CR1 crushing costs.

Table 14-8: TGP Operating Cost Summary

Cost Area	2020 (AUS$)	2021 (AUS$)
Overhead	4,487,873	3,530,692
Employee Overhead	2,292,996	2,341,067
Primary Grinding	1,466,007	1,285,106
SC 5.0 Circuit	297,956	365,268
Concentrate Circuit	1,476,231	1,762,173
Product Handling	1,094	270
Tailing Disposal	1,358	362
Tailings Dam	51,112	178,052
Ancillary Equipment	80,942	85,905
Safety	32,417	63,924
Total	10,187,986	9,612,819
TGP (AUS$/t ore)	**43.90**	**36.36**
CR1 + TGP (AUS$/t ore)	**50.35**	**42.70**
Ore Tonnes Processed	232,055	264,371
Concentrate Produced	89,017	113,659

Source: Greenbushes Forman's Report, 2020 and 2021

14.9.3 CGP1 Operating Costs

CGP1 operating costs for 2020 and 2021 (Jan-Sept) are shown Table 14-9. During 2020, CGP1 processing costs were reported at AUS$17.28/t ore processed and AUS$23.73/t inclusive of CR1 crushing costs. During 2021, CGP1 costs were reported at AUS$16.16/t ore processed and

AUS$22.50/t inclusive of CR1 crushing costs. CGP1 processing costs averaged AUS$16.73/t during this period and averaged AUS$23.13/t inclusive of CR1 crushing costs.

Table 14-9: CGP1 Operating Cost Summary

Cost Area	AUS$	
	2020	2021 (Jan-Sep)
Overhead	6,819,537	5,180,795
Employee Overhead	4,394,351	4,225,555
Primary Grinding	2,541,233	2,493,608
HMS Circuit	990,999	678,950
Product Handling	4,361	5,049
Tailing Disposal	821,241	843,499
Tailings Dam	353,936	991,904
Ancillary Equipment	69,963	85,905
Safety	60,219	94,966
Classification	442,497	460,847
Filtration	1,245,470	1,114,094
Hydrofloat	2,071,279	1,906,078
Regrinding	2,191,985	2,186,685
Flotation	1,803,323	1,520,798
WHIMS	415,077	227,434
Total	24,225,471	22,016,167
CGP1 (AUS$/t ore)	**17.28**	**16.16**
CR1 +CGP1 (AUS$/t ore)	**23.73**	**22.50**
Ore Tonnes Processed	1,401,625	1,362,294

Source: Greenbushes Foreman's Reports 2020-2021

14.9.4 CGP2 Operating Costs

CGP2 operating costs for 2020 and 2021 (Jan-Sept) are shown Table 14-10. During 2020, CGP2 processing costs were reported at AUS$42.52/t ore processed and AUS$52.23/t inclusive of crushing costs. During 2021, CGP2 costs were reported at AUS$19.28/t ore processed and AUS$24.84/t inclusive of CR2 crushing costs. CR2 and CGP2 operating costs reported for 2020 are skewed due to plant commissioning activities during 2020. Operating costs reported for 2021 are considered most indicative of operating costs for these two facilities going forward.

Table 14-10: CGP2 Operating Cost Summary

Cost Area	2020 (Jan-Apr)	2021 (May-Sep)
Overhead	5,134,488	5,646,932
Employee Overhead	2,080,297	2,642,083
Primary Grinding	1,146,199	1,622,340
HMS Circuit	318,861	761,409
Product Handling	135,056	37,211
Tailing Disposal	543,611	297,542
Tailings Dam	94,834	356,527
Ancillary Equipment	420	1,909
Safety	6,891	52,598
Classification	336,469	800,993
Filtration	71,715	174,492
Hydrofloat	293,076	859,569
Regrinding	525,554	1,233,594
Flotation	830,468	1,076,136
WHIMS	390,874	770,182
Total	11,908,813	16,333,517
CGP2 (AUS$/t ore)	**42.52**	**19.28**
CR2 + CGP2 (AUS$/t ore)	**52.23**	**24.84**
Ore Tonnes Processed	280,108	847,058

15 Infrastructure

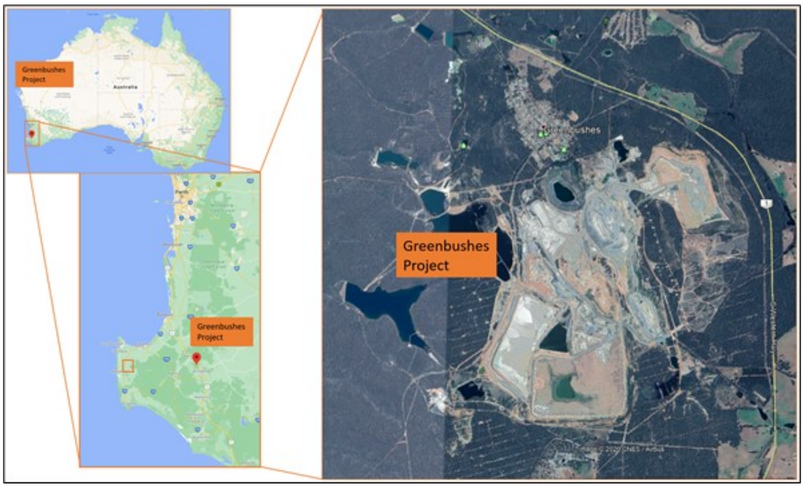
Greenbushes is a mature operating lithium hard rock open pit mining and concentration project that produces lithium carbonate. Access to the site is by paved highway off of a major Western Australian highway. Employees travel to the project from various communities in the region. The established facilities on the site include security fencing and guard house access, communications systems, access roads and interior site roads, administrative and other offices, change houses, existing mine services area (MSA), warehousing, shops, crushing plants, processing plants (CGP1/CGP2/TGP), tailings facilities, explosives storage facilities, water supply and distribution system with associated storage dams, power supply and distribution system, laboratory, fuel storage and delivery system, reverse-osmosis water treatment plant, health-safety-training offices, mine rescue area, storage sheds, mine waste storage area, miscellaneous waste storage facilities, and engineering offices. The concentrate is shipped by truck to port facilities located at Bunbury 90 km to the east of the Project. These facilities are in place and functional. An abandoned rail line is present north of the project but not currently used.

Several changes or modifications to the infrastructure are planned/or currently in progress. An upgraded 132 kV power line will be placed in service by 2023. A new Mine Service Area (MSA) will be constructed and operating by Q1 2022 to provide mine heavy and light equipment maintenance facilities and technical services offices as the existing MSA will be impacted by the planned pit progression. A mine access road will be added due to reduce truck traffic through Greenbushes. The current explosives handling facilities are being impacted by near-term pit expansion and new facilities are being completed to the west of the processing plant areas where they will not require to be moved again. The warehouse and laboratories are planned to be expanded. The tailings facilities will be expanded with the addition of a new two cell facility known as TSF4 located adjacent to and south of the existing TSF2 and TSF1 facilities. TSF1 will be expanded late in the mine life to meet tailings storage needs. The waste rock facilities will continue to expand on the west side of the pit toward the highway and south toward the permit boundary adjacent to TSF4.

15.1 Access, Roads, and Local Communities

15.1.1 Access

The project is located in southwest Western Australia, Australia south of the larger cities of Perth and Bunbury. The small town of Greenbushes, near the project location, is accessed by Australian Highway 1, known as the South Western Highway, and is approximately 80 km from Bunbury and 250 km from Perth. From Greenbushes the site is approximately 3 km south via paved Maranup Ford Road. Maranup Ford Road is called Stanifer St within the town of Greenbushes. Figure 15-1 shows the general location of the project.



Source: SRK, 2020

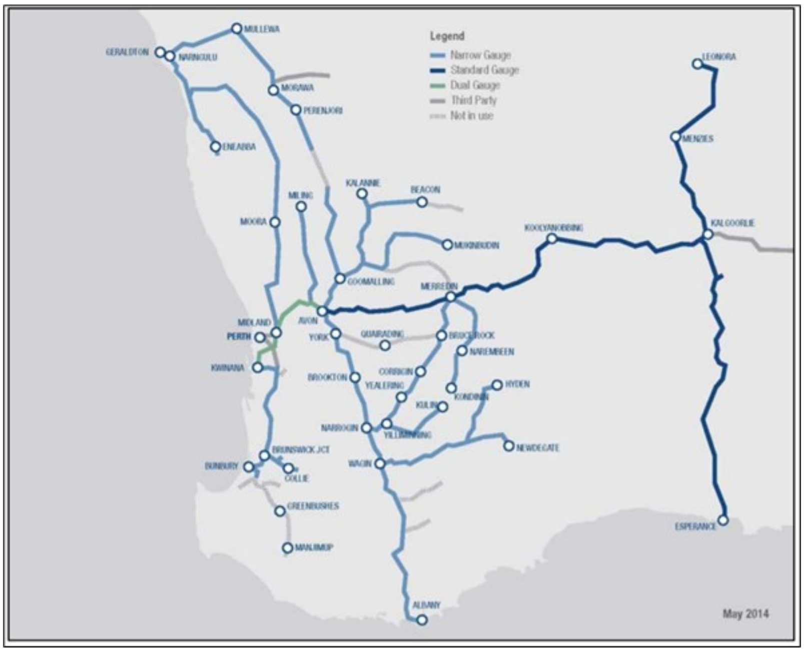
Figure 15-1: Greenbushes Project General Location

15.1.2 Airport

The nearest public airport is located approximately 60 km to the south in Manjimup. It is a small local airport with a 1,224 m asphalt runway. A larger airport with commercial flights is the Busselton Margaret River Airport located approximately 90 km to the northwest near Busselton, WA. A major international airport is located in Perth.

15.1.3 Rail

A rail line is located approximate 4 km north of the Greenbushes project. Known as the Northcliffe branch, the railway is controlled by Pemberton Tramway Company under arrangement with the Public transport Authority. Talison is researching rehabilitation of the line and utilizing the line to transport concentrate to Bunbury port. Figure 15-2 shows the location of the line. At Bunbury it connects with lines to the north to Perth and through Perth to the east. Talison has been undertaking minor repair work to rehabilitate rail access to the site.



Source: Economics and Industry Standing Committee The Management of Western Australia's Freight Rail Network Report No. 3, October 2014

Figure 15-2: Western Australia Railroad Lines

15.1.4 Port Facilities

Port facilities are available and used at Bunbury, 90 km north of the project. Bunbury is a major bulk-handling port in the southwest of Western Australia (WA). The Berth 8-8 shed is used for product storage. The bulk product is loaded into ships that are less than 229 m long and with a permissible draft of 11.6 m. The ship loader operates at 1,500 to 2,000 t/h depending on the configuration on the feed side. The feed can either be by Road Hopper or directly form the bulk storage at the higher rate.

The loading unit and storage sheds are shown in the photograph in Figure 15-3.

Source: Port of Bunbury Web Site (www.byport.com.au/berth8) , 2020

Figure 15-3: Berth 8 at Bunbury Port

15.1.5 Local Communities and Labor

The mine and processing facilities are located about 3 km south of the community of Greenbushes part of Bridgetown-Greenbushes Shire and the community of Greenbushes is the closest community to the site. Personnel working at the project typically live within a thirty-minute drive of the project. Table 15-1 shows the local communities and distance from the site. Note that Bunbury and Perth are included for reference as major cities in the region. Skilled labor is available in the region and Talison has an established work force with skilled labor. The current labor levels are approximately 659 people as summarized in Table 15-2. Full Time Equivalent (FTE) personnel refer to additional part-time contract personnel included to represent the total labor requirement by Talison.

Table 15-1: Local Communities

Community	Population	Distance from Greenbushes (km)
Greenbushes	390	3
Bridgetown	4,350	20
Manjimup	5,400	57
Nannup	1,400	50
Donnybrook	6,100	45
Boyup Brook	1,800	42
Bunbury	12,100	80
Perth	2,100,000	250

Source: SRK, 2020

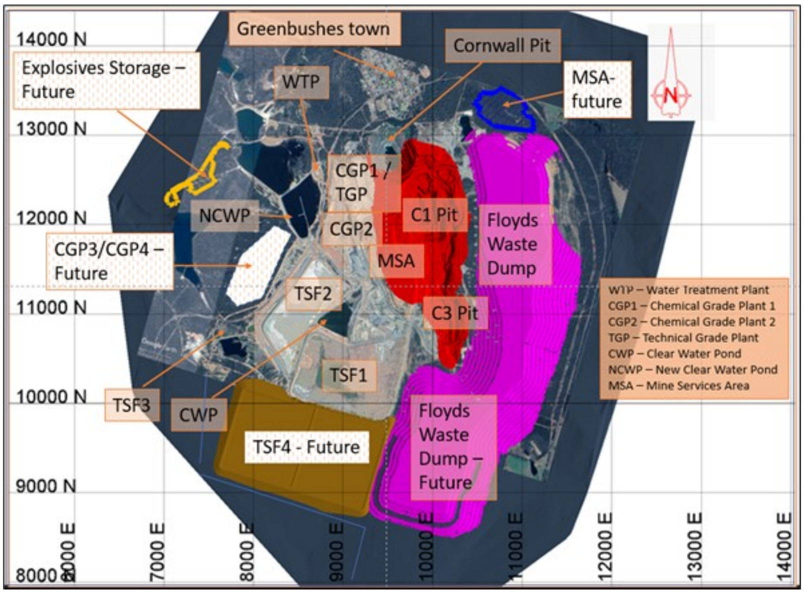
Table 15-2: Labor by Area

Area	2020
Administration	28
OHSTEC	22
Mining	37
Processing	109
Maintenance	49
Infrastructure	64
Shipping	6
Projects	7
Total Talison	321
L&H Mining Contractor	114
D&B Mining Contractor	32
Blasting Contractor	3
Total Contractors	149
FTE Personnel	188
Total Operational Workforce	659

Source: Talison, 2020

15.2 Facilities

The Project facilities are located proximate to the site. The overall layout can be seen in Figure 15-4. The established facilities on the site include security fencing and guard house access, communications systems, access roads and interior site roads, administrative and other offices, change houses, existing mine services area (MSA), warehousing, shops, crushing plants, processing plants (CGP1/CGP2/TGP), tailings facilities, explosives storage facilities, water supply and distribution system, power supply and distribution system, laboratory, fuel storage and delivery system, reverse-osmosis water treatment plant, health-safety-training offices, mine rescue area, storage sheds, mine waste storage area, miscellaneous waste storage facilities, and engineering offices. These facilities are in place and functional.



Source: SRK, 2020

Figure 15-4: General Description with Facilities Map

15.2.1 Key Changes to Existing Infrastructure

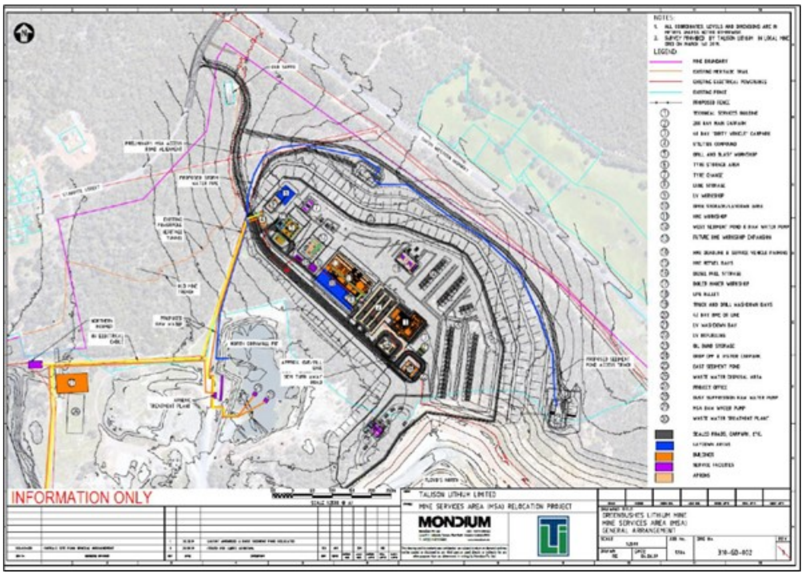
Several changes or modifications to the infrastructure are planned/or currently in progress. An upgraded 132 kV power line will be placed in service by 2023. A new Mine Service Area (MSA) will be constructed and operating by Q1 2023 to provide mine heavy and light equipment maintenance facilities and technical services offices as the existing MSA will be impacted by the planned pit progression. A mine access road will be added due to reduce truck traffic through Greenbushes. The current explosives handling facilities are being impacted by near-term pit expansion and new facilities are being completed to the west of the processing plant areas where they will not require to be moved again. The warehouse and laboratories are planned to be expanded. The tailings facilities will be expanded with the addition of a new two cell facility known as TSF4 located adjacent to and south of the existing TSF2 and TSF1 facilities. TSF1 will be expanded late in the mine life to meet tailings storage needs. The tailings storage is discussed in detail in Section 15.6.

15.2.2 Powerline Upgrade

The site power system is being upgraded in 2022 to include a 15.3 km 132 kV power line routed to the north from Bridgetown North and then to the west along the south side of TSF4 past the end west of TSF4 and then north to the future location of CGP3/CGP4. The upgrade will include a 132 kV outdoor busbar with 2 x 60 MVA transformer circuits and a 22 kV switch room. Additionally, there will be a combined 132 kV relay room and Western Power 132 kV control and measuring room to upgrade the power to the site for potential future expansion.

15.2.3 Maintenance Service Area (MSA)

The current MSA is located on the IP dump near the existing open pit. The pit will consume the MSA, and relocation is necessary. The new MSA will be located to the northeast of the pit area as seen in Figure 15-4. The new MSA move is in progress and will be completed by Q1 2023. The facility supports maintenance activities on heavy mobile equipment including drill and blast equipment. The facility includes welding shops, support facilities including heavy and light equipment wash bays, lube storage and dispensing, tire handling and storage facilities, laydown yards, mining equipment parking, lighting, diesel storage and delivery facilities for light and heavy equipment, and a technical services complex with three separate offices and shared common areas. A parking area for contractor and employee parking is included in the facility design. The new facilities have a separate water supply, surface water control ditches and ponds, and waste-water treatment system. Construction is being completed in three stages with a pre-construction phase that includes bulk earthworks, geotechnical investigation, design, and tender which is currently being completed. The second stage will include the first stage of construction that will occur in 2020 followed by a further expansion that will be tied to potential future expansion of the mining fleet in five years. Figure 15-5: shows the new MSA layout.



Source: Talison, 2020

Figure 15-5: Layout of the New MSA Facilities

15.2.4 Mine Access Road

The existing route for the trucks transporting the concentrate, is to travel along the South West Highway from Bunbury and then traverse through the Greenbushes townsite via Stanifer street to the Greenbushes Lithium Mine. The number of supply and product transport truck movements associated with the mine is expected to increase in the future. An investigation was carried out to identify what alternative routes there were for the trucks to access the Mine which did not require them to traverse through the Greenbushes townsite. An alternate route to the west of the Greenbushes townsite was located and a project to construct a new road was designed. This project is planned for 2023.

15.2.5 Explosives Storage Area

The current ammonium nitrate (AN) storage and batching facilities and primer storage facilities will be impacted by future pit expansion to the east. The new facilities allow for larger capacity and the expansion will be completed in stages as needed. The new location is the west of the processing plant on the west side of Maranup Ford Road between Cowan Brook Dam and Austin's Dam as shown in Figure 15-4. Specifically, the new facility Talison scope includes:

- AN bulk storage shed
- Two explosives magazines for storage of high explosives and detonators
- Two additional explosives magazines have been deferred until 2024
- Crib room, office, and ablution block, with explosives mixing and delivery truck (MMU) maintenance workshop
- Supporting utilities and services such as storm water and sewerage systems, redirection of a Talison water supply pipeline from Cowan Brook Dam to Southampton Dam, lighting and services
- Site security fencing, swipe card-controlled access gates and turnstile pedestrian gate
- Site closed circuit television (CCTV) cameras
- Fire water tanks and pumps to provide bushfire and ember attack protection
- Construction of access road and road crossings

The explosives are supplied by a contractor who will operate the facility and also supply additional equipment as part of their contract. The move is planned to be completed in 2021.

15.2.6 Warehouse Workshop Expansion

The warehouse workshop is planned to be expanded for additional space. The design work has been initiated and the expansion will be completed in 2024.

15.2.7 Laboratory Expansion

The laboratory geological preparation facility is being modified to provide additional materials handling capacity. The lab upgrade also will include an XRF upgrade to handle additional testing. The expansion is expected to be complete in 2024.

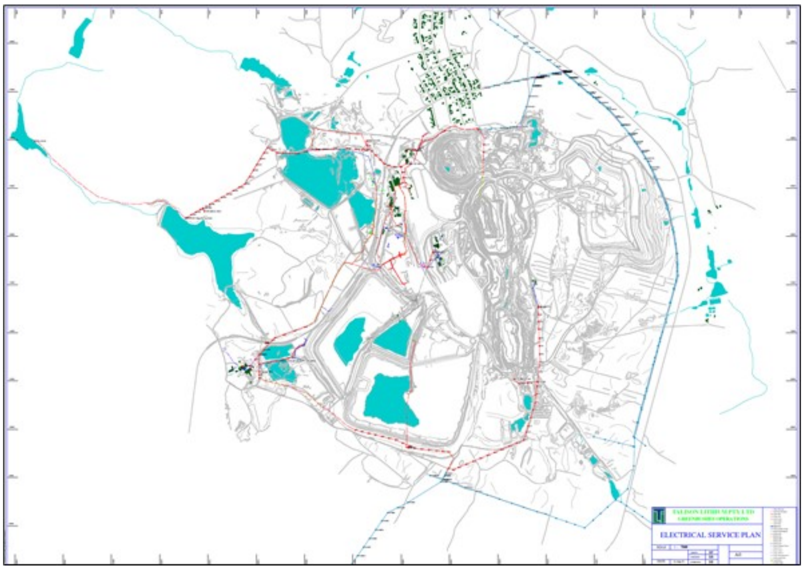
15.3 Waste Rock Storage and Temporary Stockpiles

Waste rock storage and temporary stockpiles are discussed in detail in Section 13.6.

15.4 Energy

15.4.1 Power

Greenbushes has a mature power delivery system with two feeds from Western Power with wholesale power from Alinta Energy through the Talison's retailer Perth Energy. The power supply system is in a loop configuration so that the project has redundancy (Figure 15-6). main Western power line runs from north, west of the town of Greenbushes, along the west side of the Project parallel to the South Western Highway to a point where it turns due west to a point approximately aligned with the center of the deposit and then continues due south. The Talison 22 kV power system connects to the north near the town of Greenbushes and then to the south near the future location of TSF4. The Talison 22 kV connection from the south runs along the TSF1 and TSF2 to the west then turns north to the processing facilities on the north end of the deposit where it connects with the Talison north feed. Portions of the Talison supply system is on poles above ground other portions are underground to reduced congestion with other infrastructure and facilities.



Source: Talison, 2020

Figure 15-6: Greenbushes Power Layout

Talison has a current connected load of approximately 20 MW and a running load of approximately 16 MW. The project used 1.1 MWh in 2019 and annually spends approximately US$9 million on power at a unit rate of approximately US$0.085/kWh.

15.4.2 Propane

Propane (LPG in Au) is used for drying in the TGP, laboratory sample furnaces, shipping floor sweeping. The site consumes approximately 1.2 M liters annually. Storage is on site in LPG tanks. A 118,000-liter bulk tank is near TGP. A cylinder bank (210 kg capacity) is located at the lab. Two small 45 kg cylinders are used by the sweepers. Supply is by tanker truck for the large bulk tank.

15.4.3 Diesel

The site has four diesel tanks with a capacity of 55,000 liters each. Three are associated with the current MSA. One is located in the processing area. The three tanks associated with the existing MSA will be removed from service and disposed of once the new MSA is constructed. The new MSA will have two new 220,000 liter tanks when initial construction is complete. An additional 220,000 liter tank will be added in 2025, with the first site majority of the use is for the mining fleet. Supply is by tanker truck.

15.4.4 Gasoline

No gasoline is stored on site.

15.5 Water and Pipelines

Water Supply and Storage

Mine water supply is sourced from surface water impoundments for capture of precipitation runoff, pumping from sumps within the mining excavations and recycled from multiple TSFs. No mine water is sourced directly from groundwater aquifers through production or dewatering wells. This lack of significant groundwater production for mine usage indicates the overall importance of the surface water and TSF water management systems to the operational capacity of Greenbushes.

Existing water sources and storage facilities at the mine include active and flooded historical mining excavations (C1/C2/C3 pits, and Vulcan pit), surface water impoundments/dams (Cowan Brook, Southampton/Austin’s Dam, Clear Water Dam, Clear Water Pond, Mt. Jones Dam, Norilup Dam, Dumpling Gully Dam, Swenkies Dam, and Tin Shed Dam), and tailings storage facilities (TSF1 and TSF2). Additional near-term storage is planned through the construction of TSF4 and expansion of the waste rock landform (WRL) storage infrastructure. The majority of these water sources and impoundments are linked through constructed surface pumps and conveyance.

Water Balance

SRK reviewed a water balance model constructed in 2018 to support current and future proposed operations at Greenbushes (GHD, 2018). The model included all existing water sources and storage facilities, pumps and transfer capabilities, and operating rules. On top of this base was added the proposed additional storage infrastructure and pump/pipeline modifications to increase optimization. In addition, numerous assumptions were applied where empirical data were not available to support operating methodology of the site wide water supply system.

The results of the water balance model indicated that there could be significant water supply shortfalls by 2025, potentially limiting operation of the proposed larger network of processing facilities, with significant depletion of water levels within the storage facilities by 2023. While the addition of water storage within TSF4, and more significantly the WRL, do serve to alleviate the magnitude of near-term supply shortages most commonly in the summer months; these structures will not serve to reduce the frequency of these supply shortfalls (GHD, 2018). Long term security of supply appears to be challenged.

Long term security of water supply is a significant risk for Greenbushes, given the scope of the proposed expansion of operations. Additional water storage structures, beyond those currently proposed, should be considered. It is recommended that those structures be located outside of the current facility catchment to maximize new supply sources.

15.6 Tailings Disposal

SRK performed a review of tailings data, relevant to the estimation of reserves, provided by Talison. Greenbushes has four tailings storage facilities (TSF) and SRK's review focused on the currently active TSF and plans for two future TSFs. Documentation available to SRK included the design data, the two most recent annual site inspection reports, and supporting data. SRK's review is for the purpose of supporting the resource and reserve disclosure reported herein and should not be interpreted by the reader to reflect an analysis of or any certification of TSF dam stability or associated risk and in no way should be interpreted to substitute for the role or any responsibilities of the Engineer of Record for the TSFs. SRK's scope of work included review to confirm that applicable design documentation exists, review the operational aspect of the TSFs, check that the planned TSF capacity is adequate to support extraction of the full reserve for the Project, and to note risk and opportunity associated with the operation and capacity of the TSF, as applicable to estimation of reserves.

15.6.1 General Overview

Greenbushes has four TSFs on site. Greenbushes utilizes pumped slurry tailings through pipelines that are deposited by spigot in conventional tailings storage for long term tailings storage. The four tailings storage areas are designated TSF1, TSF2, TSF3, and TSF4. TSF2 is the only currently active TSF. Figure 15-7 shows the existing and future tailings locations.

- TSF1, currently approximately 110 ha in size, was constructed in 1970 and operated for approximately 30 years mainly for tantalum production and was placed on care and maintenance in 2006. It was initially laid out in a three-cell configuration but has subsequently modified into a single cell with a central decant. At the existing mRL 1280 crest it holds approximately 333 Mt of storage capacity. A 5 m high upstream lift was constructed in 2018 using mine overburden materials. This capacity allows TSF1 to be available for emergency storage of tailings if needed (GHD/Talison, 2020). The tailings facility will be upgraded, and additional lifts added for further use late in the mine life. Talison has near term plans to reprocess tailings from the TSF1 in the Tailings Reprocessing Plant (TRP).
- TSF2, currently approximately 35 ha in size, is the only active TSF and has been in operation since 2006. The facility was constructed in 2006 with additional upstream raises that elevated the crest level to mRL 1271, the current elevation, which is approximately 36 m above lowest ground level, (GHD/Talison, 2020). The TSF will eventually be elevated to a final elevation of mRL 1280. The additional planned additional capacity will be 9.9 Mt.
- TSF3 is a small (5 ha) historic tailings storage area approximately 1 km south of TSF1 and is closed and undergoing trial reclamation. The small storage pre-dates 1943 and was historically used to dispose of slimes from the Tin Shed operations, which are thought to

contain about 800,000 t of process waste. Local information is that deposition ceased around the late 1980s or early 1990s (GHD/Talison, 2020).

- TSF4 is a two-cell 240 ha new downstream construction slated for 2021/2022 that will be the primary storage area for the remaining LoM. The TSF4 facility will have two-cell design adjacent to TSF1 for a portion of the northern edge. The two-cell system will allow balancing of the fill between the cells while the facility is in service from 2022 through 2048. The final elevation will be 1295 mRL. The total capacity of the facility is planned to be 68.2 Mt.
- Water is managed at the TSF1 and TSF2 facilities through local ponds. The 8.5 ha old Clear Water Pond (CWP) is a small water storage facility located between TSF1 and TSF2. It held water from the TSF2 decant system before water was returned to the process facilities. CWP now acts as the TSF2 decant system. The New Clear Water Pond (NCWP) is the primary water storage for TSF2. Water management, as summarized by GHD (GHD/Talison, 2020) follows:

  Rainfall runoff from the surfaces directly surrounding TSF 1 and TSF 2 collects within local surface water ponds. Runoff from the western side of TSF 1 and TSF 2 embankments and foundations is directed into open drains and pipe work running alongside Maranup Ford Road. The seepage water from TSF1 eastern wall reports back to Vultan dam via existing old mining channels. Vultan water is then pumped back to the TSF2 decant and into process.

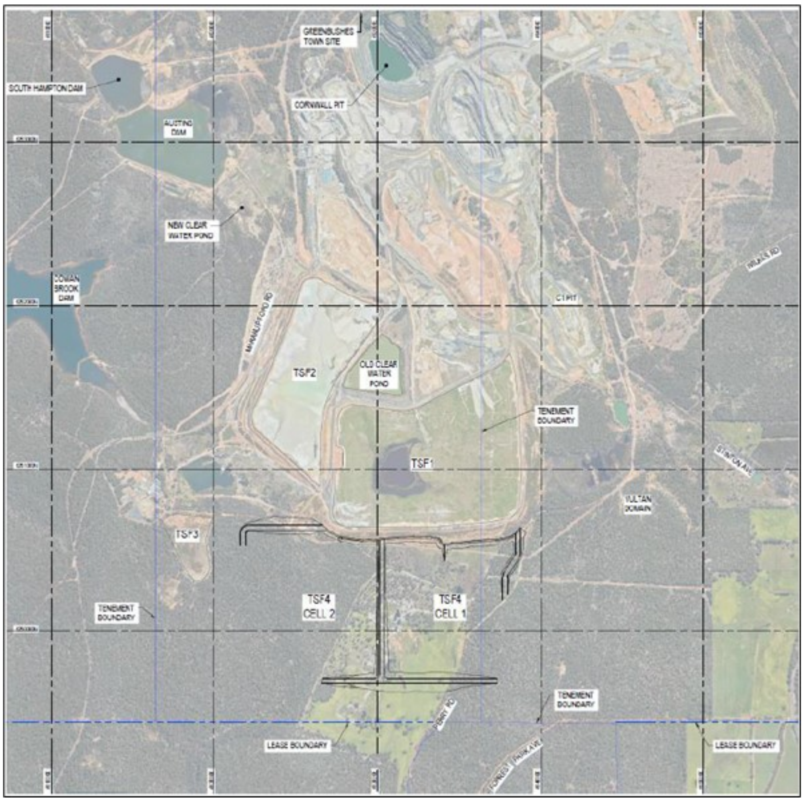
  Decant water from TSF 2 is pumped via a floating suction decant to the NCWP from where it is pumped back to CGP1, CGP2 and TGP. Water is pulled from the circuit into the ATP where the processed water is returned back to the mine process water circuit.

  Surface water runoff on the southern and eastern sides of TSF 1 is diverted east by a channel into the Old Pits and is pumped back into CWP where it is returned to the plant water circuit.

  At the time of this audit there was no decant pond on TSF 1 and no active return water system in operation.

  Decant water from TSF 2 is pumped via a floating suction decant to the NCWP and mainly returned to the plant water circuit after removal of arsenic or to Austin's Dam for return to the plant when required. Surplus water is pumped to Southampton Dam and some surplus from there is stored in underground workings until recovered in summer. Cowan Brook Dam is also used on occasion to top up the plant water circuit during dry periods.

  The TSF4 water handling system will include a centralized tailings pumping station capable of moving tails from CGP1, CGP2, and TGP, power reticulation install and upgrade to the existing CGP1 tails booster pump system. The TSF4 design includes a decant system, underdrainage, toe drains, surface collection trenches and the associated sediment collection ponds



Source: Talison, 2020

Figure 15-7: Greenbushes Tailings Locations

15.6.2 Design Responsibilities and Engineer of Record

Design responsibilities for the active tailings facilities have been performed by GHD. SRK documents the key engineering activities and the companies involved as follows:

- TSF1
  - D E Cooper & Associates (DCA) is understood to have been the original design engineer and Talison has limited documentation through 1998 from DCA
  - GHD has done inspections since 2013 including this facility

- TSF2
  - Constructed in 2006 under the direction of DCA
    - Stability modelling (DCA 2005) confirmed that the embankments met government guidelines and the stability modelling assumptions were confirmed by monitoring readings (GHD 2013a). Further geotechnical investigation and analyses indicated that there was some potential for liquefaction of the tailings under earthquake conditions (GHD 2013c). After consideration of alternatives, it was decided that a stability buttress should be added to the southern and western walls. To achieve the wider footprint, part of the Maranup Ford road was realigned further to the west. The current design also incorporates internal seepage interceptor drains with discharge pipes carrying the water through the embankment to an external collection system. (GHD)
  - GHD is and will be the Engineer of Record for TSF2.
  - GHD has performed inspections on this facility since 2013
  - GHD completed an engineering design for the development of TSF2 from mRL 1265 to mRL 1280 in 2015. An updated design was completed in 2020 to raise the facility to mRL 1275.
  - GHD monitored construction (Feb 2019 – Oct 2019) and provided a summary construction report at the completion of construction. (GHD, TSF2 Construction Report, February 2020)
  - A Dambreak Study was conducted by GHD in 2019 updating the 2014 Dambreak Study by GHD (GHD Draft Report dated October 2019)
    - Key findings from GHD included potential impact of TSF2 breaches to the north or west on CGP2 and other planned future facilities at mRL 1300. Based on GHD's analysis, breaches at mRL 1280 would have significantly lower impact
    - GHD provided a preliminary engineering design for a ground improvement project on TSF2 in 2021 that will support buttressing the central section of theTSF2 western wall.
  - GHD will have design responsibilities for the active facilities TSF 2 and the future TSF4
- TSF3
  - There is limited design data available for TSF3 and no significant deposition has occurred since 2008. The facility is in the process of being reclaimed. GHD continues to inspect the area during their annual inspections.
- TSF4
  - TSF4 is new construction and GHD is the Engineer of Record for the design and will participate in the construction and monitoring of the construction. Talison plans to use GHD to monitor the ongoing operations consistent with their use on the annual tailings dam inspections.

15.6.3 Production Capacities and Schedule

The production schedule over the life of mine requires as total storage capacity of 80.0 million m^3 (112.1 million tailings tonnes @1.4 t/m^3) of tailings. This equates to approximately 2.3 million m^3 per year of tailings placement. The tailings construction plans allow for placement of tailings in two or more locations to balance rate of rise needs. The tailings placement schedule with start and end year as well as capacity available and used is summarized in Table 15-3:.

Table 15-3: Capacity Confirmation

Storage Location	Status	Start (year)	Finish (year)	Size (ha)	Current mRL	Final mRL	Additional Capacity (Millions of m³)	Capacity Used (Millions of m³)
TSF1	Inactive	2044	2055	110	1280	1300	25.5	25.4
TSF2	Active	2020	2023	35	1271	1280	5.9	5.9
TSF4	Construction	2022	2048	240	N/A	1295	48.7	48.7
Total Capacity (accounting for design freeboard)							80.1	80.0

Source: SRK, 2021

15.6.4 Tailings Risk Discussion

Several risks are noted in review of the tailings data:

- Tailings storage facilities are typically one of the highest risk aspects of a mining operation. Even if the probability of occurrence of a major incident is low, the magnitude of potential impact is often high which results in overall high risk to the business. Therefore, while SRK is not evaluating TSF dam stability or risk, it recommends that Talison follows all recommendations from its Engineer of Record in a prompt manner.
- SRK recommends a Comprehensive Dam Safety Review by a third party to be completed on all TSFs as soon as possible. This review will further clarify any issues of significance that have not been flagged by GHD and will provide guidance to Talison on any other key issues. The review will also note any deficiencies in the underlying design data and could flag additional technical work (geotech, hydro, materials characterization) to support future design or mitigation needs.
- The timing on construction of TSF4 is important from an operational flexibility standpoint with TSF2 being the only active TSF and TSF1 only available for emergency use. SRK recommends accelerating TSF4 construction, if possible.
- The TSF1 design will require additional geotechnical and hydrogeology work to clarify design parameters and understand clearly the risks associated with the in-situ tailings due to the historic nature of TSF1 and lack of detailed historic design information. This work has begun, but SRK notes it should progress so that a more detailed plan is developed for TSF1 so that it can be available if needed for future expansion or if problems develop with the other active TSFs. SRK recommends that Talison follow all recommendations by the EOR.
- SRK recommends that the tailings life of mine planning be integrated into the LoM mine planning effort to confirm long term planning needs and to prioritize issues if expansion plans move forward.

16 Market Studies

SRK was engaged by Albemarle to perform a preliminary market study to support resource and reserve estimates for Albemarle's mining operations. This report covers the Greenbushes mine and concentrator and summarizes data from the preliminary market study, as applicable to the estimate of resources and reserves for Greenbushes. The preliminary market study and summary detail contained herein present a forward-looking price forecast for applicable lithium products. This includes forward-looking assumptions around supply and demand. SRK notes that as with any forward-looking assumptions, the eventual future outcome may deviate significantly from the forward-looking assumptions.

The Greenbushes facilities produce a range of spodumene concentrate products that are sold into technical and chemical lithium markets. As discussed in Section 11.5, Talison's ability to predict lithium production for technical grade product at a level that meets the standard of uncertainty for a reserve requires grade control drilling and therefore has been excluded from this reserve estimate. Instead of predicting production of technical grade concentrate, SRK has assumed that all product produced by the operation is sold into chemical markets. In SRK's opinion, from a geological standpoint this is a reasonable assumption as any material that is appropriate to feed technical grade production can also be used for chemical grade feed. In SRK's opinion, it is also reasonable (and somewhat conservative) from an economic standpoint as the weighted average price Talison has historically received for technical grade concentrates is higher than the average price for chemical grade concentrate (i.e., assuming receipt of chemical grade revenue likely understates the value of production that would typically go to technical grade markets).

As the technical grade production is not included in the reserve, it has also been excluded from this market discussion. For reference, based on a review of Talison's internal forecasts that do include technical grade planning, technical grade production comprises approximately 10% of volume and revenue for the period from 2021 to 2023 which further supports the exclusion of technical grade product as reasonable (i.e. its materiality to the operation is limited).

The Greenbushes operation also has the ability to produce tantalum concentrate. However, Talison does not own the rights to this production and does not receive any economic benefit from it. Therefore, it has not been included in this analysis.

16.1 Market Information

This section presents the summary findings for the preliminary market study completed by SRK on lithium.

16.1.1 Lithium Market Introduction

Historically, (i.e., prior to the 2000s), the dominant use of lithium was in ceramics, glasses, and greases. However, with the boom in the use of portable electronic devices, starting with mobile phones and laptop computers and now covering a wide range of consumer electronic products, the use of lithium in lithium ion batteries has grown from a fringe portion of the market to the most significant portion of demand. Over the last few years, the development of the battery electric vehicle (BEV) industry has further driven demand growth in lithium usage in lithium ion batteries. If BEVs expand from their current niche position to a mainstream method of transportation, lithium demand in BEV batteries will overwhelm all historic uses and require multiples of historic levels of production.

Lithium is currently recovered from hard rock sources and evaporative brines. Current and potential future hard rock sources include minerals such as spodumene, lepidolite, petalite, zinnwaldite, jadarite, and lithium-bearing clays. Most brine operations pump a chloride-rich solution in which most of lithium occurs as lithium chloride (LiCl) (there is more limited production and production potential from carbonate brines). For the rest of this document, unless specifically noted, when referring to brine production SRK will be referring to chloride brines, and when referring to hard rock, again unless specifically noted, SRK will be referring to spodumene. This is to minimize the complexity of this explanation and given these are the dominant forms of production from both sources, this simplification covers the majority of current and future production sources.

For use in batteries appropriate for electric vehicles, lithium is generally used in either a carbonate or hydroxide form. For this type of production, both brine and hard rock sources require separation of lithium and then conversion to a form that can be purified into a feed solution to produce lithium carbonate, which is then converted to a hydroxide or, in some cases, directly produces lithium hydroxide without first going through the carbonate form. Current practice allows direct production of lithium carbonate from either brines or hard rock sources, whereas only hard rock sources directly produce lithium hydroxide (brine operations all first produce lithium carbonate which is then converted to hydroxide, if desired). However, multiple parties are evaluating the potential to produce lithium hydroxide directly from a brine source, and there is a reasonable probability this dynamic will change over time.

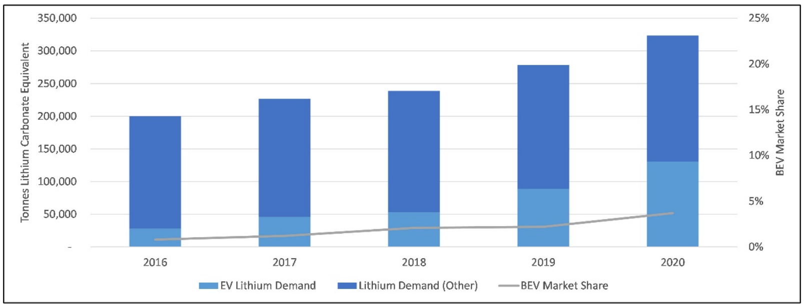
For existing producers, the major differences in cost between brine and hard rock include the following:

- Hard rock sources require additional mining, concentrating, and roasting/leaching costs.
- For a final hydroxide product, brine sources first produce a lithium carbonate that requires further conversion costs, whereas hard rock sources can be used to directly produce a lithium hydroxide from a mineral concentrate.
- Brine sources require concentration prior to production, as natural brine solutions are generally too diluted to allow for precipitation of lithium in a salable form.
- Brine sources generally have a higher level of impurities (in solution) that require removal.

Historically, brine producers have had a significant production cost advantage over hard rock producers for lithium carbonate and a smaller cost advantage for lithium hydroxide. Hard rock production generally provided swing production for these industries, as well as satisfied other aspects of the lithium market (e.g., glasses and ceramics). As many new producers enter the market on both the hard rock and brine side, this prior norm is changing, as many of the new brine producers have relatively high operating costs when compared to traditional hard rock production, especially with respect to the production of lithium hydroxide.

16.1.2 Lithium Demand

In recent years, the lithium industry has gone through an evolution. The ceramic and glass sectors were traditionally the largest source of demand for lithium products globally. However, the development boom in demand for mobile consumer applications reliant upon lithium ion batteries has structurally changed the industry. Much of this change, through approximately 2015, was driven by devices such as phones, laptop computers, tablet computers, and other devices (e.g., speakers, lights, wearables, etc.), as well as small mobility devices (e.g., electric bikes). However, the use of lithium in the recent nascent adoption of battery electric vehicles (BEVs) has quickly become the most important aspect of overall lithium demand, not just within the battery sector of demand, but for lithium demand on whole. This is seen in Figure 16-1, with BEV market share rapidly growing in importance and driving overall demand growth in the lithium industry.



Source: SRK, 2021

Figure 16-1: Global Electric Vehicle Lithium Demand

Going forward, the range of potential future demand scenarios is heavily dependent upon the adoption of BEVs as a significant component of automotive sales and the technology utilized in their batteries. Therefore, there remains significant uncertainty in future demand growth associated with BEVs, with general personal vehicle ownership likely to change (i.e., ride hailing and car share), potential battery chemistry changes (e.g., solid-state batteries), and changes in battery pack sizes. In addition, there is uncertainty around other potential sources of lithium demand (e.g., home power storage, grid power storage, commercial transport, public transport, demand destruction in traditional markets, etc.).

Nonetheless, acceleration in the growth of the BEV industry appears to have a high probability. Demand growth in 2019 and 2020 were relatively disappointing but were likely driven by external factors (e.g. changes in BEV subsidies in jurisdictions such as China as well as the global COVID-19 pandemic) that have largely moved through the system. Even with COVID-19 still a major health issue, SRK believes the lockdowns of early 2020 that created major economic damage will not be repeated as governments are learning to better manage the disease. Most auto makers and other industry participants have invested heavily to expand into BEV production and transition overall toward expectations of future dominant consumption of EVs instead of internal combustion engine (ICE)-based vehicles. However, in SRK's opinion, there remain several barriers to BEVs becoming the dominant type of vehicle sales, including:

- Costs
- Changes in buyer perceptions
- Raw material availability

Currently, for BEVs to have a range that is competitive with ICE-powered cars, they must have a large and expensive battery pack. Based on recent estimates by Bloomberg New Energy Finance (BNEF), in 2020, the battery pack comprised approximately one third of the total up-front cost of a new BEV. For higher end vehicles, this cost is manageable in the context of the overall vehicle cost. However, for entry level vehicles, the cost of the battery pack remains a hurdle to BEVs being competitive with ICE cars. The price of batteries has been rapidly decreasing as the scale of production has increased and technological advances have focused on cost reduction. A 2019 prediction by BNEF assumes that these trends will continue and the threshold where BEVs become generally affordable (US$90/kWh on unit basis for the battery pack) is predicted to occur in 2022.

Consumer preference is a major barrier that will have to be passed to allow widespread adoption of BEVs. Currently, SRK believes this is an issue because many of the auto manufacturers have treated BEVs as niche vehicles that were meant to appeal to buyers wishing to make a statement. While this works for the niche population that wishes their vehicle to make such a statement (likely following the Toyota Prius strategy), a typical buyer will likely be turned off by this style of marketing. Further, to date, auto manufactures have focused on developing electric vehicles as sedans and compact cars and have not targeted the booming SUV and pickup truck market. However, these trends are changing, with Tesla producing cars that have widespread appeal from a style standpoint and take advantage of the inherent performance advantages of BEVs (e.g. outperformance relative to ICEs for handling and acceleration) and not surprising leading all other global manufacturers in sales. In addition, SUV BEV models started sales in 2020 and BEV pickup truck sales are expected to start in 2021.

In SRK's opinion, raw materials and supply chain limitations are the other major risk to widespread EV adoption. SRK does not expect this bottleneck to come from lithium, at least in the short- to mid-term (longer term, it may become an issue, but widespread recycling will likely mitigate this risk). Downstream production (e.g. battery-grade lithium carbonate/hydroxide, cathode precursor, cathodes, batteries, etc.) also appears to have a low risk of creating a bottleneck, as extensive investment in this manufacturing capacity has already happened and continues. However, other raw materials, especially nickel and cobalt, both of which are critical to the key cathode technology of NMC and NCA, appear to create future supply risk. SRK believes it is likely that additional nickel supply can be developed at a cost (i.e. higher nickel prices will be required), but adequate cobalt supply to maintain current levels of cobalt will likely not be feasible. The most likely solution to this bottleneck will be the elimination (or reduction to minimal levels) of cobalt in BEV batteries through technological improvements.

Overall, given the discussion above, SRK expects near- to mid-term growth in the BEV market to pick back up from the two recent relatively slow growth years. However, there remains the risk that BEVs stay a niche vehicle or are eliminated completely (although this is looking less and less likely). The most serious risks that SRK can foresee are technology related, such as substitution of alternative technology (e.g., fuel cells make a comeback), battery costs plateau, and BEVs remain uncompetitive on low-cost vehicles or cobalt cannot be substituted out of batteries and adequate supply cannot be sourced. Under any of these three scenarios, demand for lithium from BEVs would be severely curtailed (if not eliminated). However, overall SRK does not view these downside scenarios as likely.

To quantify potential demand growth, SRK constructed a basic demand model. In its model, SRK ran three scenarios through 2029:

- The first scenario, as the base case, assumes that demand growth will continue the robust trend of late 2020 as government subsidies bridge the gap to lower battery costs and the associated reduced costs make EVs fully competitive. Further, the wide range of new models under development by the major auto manufacturers will appeal to the typical consumer. Growth rates start to taper in the latter half of the decade as BEVs hit around 45% of sales in 2028 and continue to decline given the high penetration. 2030 BEV sales are predicted as 55% of global automotive sales in this scenario.

- The second scenario, as the high scenario, assumes that demand growth accelerates more quickly in 2023 and 2024 with falling battery prices and then starts to slow as EVs reach 30% market penetration (likely limited by manufacturing capacity), but continues at a faster growth rate than the base case with 50% market penetration by 2027 and more than 70% by 2030. This scenario is feasible if new BEV models are highly desirable to consumers, subsidies can fully bridge the gap to battery costs dropping to the point that BEVs are cheaper to buy than economy gas powered vehicles (i.e., sub US$60/kWh battery costs), and the manufacturing supply chain can support this growth. Alternatively, even with somewhat slower personal consumer purchases of BEVs, significant uptake of commercial vehicles, such as large trucks and taxis, or the combination of automotive grown and major growth in grid or home power storage could also drive this scenario.
- The third scenario, as the low scenario,[1,2] assumes that the demand growth spike in late 2020 is not sustained as lower income population stays away from BEVs. Around 2023, with battery prices falling (although maybe not fully competitive), growth slowly picks up as the average consumers are slower to accept a major change to a BEV. Under this significantly curtailed growth scenario, BEV sales only achieve 7.5% of global vehicle sales in the model period. This scenario reflects a situation with battery costs failing to fall below ICE costs or development of alternative technologies that substitute away from BEVs (e.g., fuel cells).

16.2 Lithium Supply

Lithium supply is currently sourced from two types of lithium deposit: hard rock (spodumene, lepidolite, and petalite minerals) and concentrated saline brines hosted within evaporite basins (largely salt flats in Chile, Argentina, and Bolivia termed salars). Exploration and technical studies are currently ongoing on three additional types of deposits: hectorite clay deposits, a unique hard rock deposit with a lithium-boron mineral named Jadarite, and other deep brines (e.g., geothermal and oil field). Although extensive study has been completed on these alternate lithium sources, they have not yet been commercially developed.

Currently (i.e., 2020 production), approximately 47% of lithium produced comes from brines and 53% from hard rock deposits. Hard rock deposits have traditionally produced mineral concentrate (e.g., spodumene or petalite) with a wide variety of technical specifications that are used in a wide variety of industrial activities, often being converted to lithium carbonate or hydroxide as intermediate products through hydrometallurgical processes. Brines have traditionally produced a lithium carbonate product (of varying qualities) which may then be converted to a variety of lithium products for various commercial activities. Brines have traditionally been the lowest-cost producers of lithium

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[2] Note that SRK acknowledges a potential scenario where an alternative power source is found for individual and commercial transportation that does not use lithium (e.g., fuel cells or alternative battery technologies). Under this scenario, growth would be certainly be lower, although there is the potential that more traditional uses of lithium return to the market to pick up some of the lost future demand.

carbonate, and its derivative products with hard rock deposits act as primary mineral supply or swing production for lithium carbonate and derivatives.

Until recently, global lithium production was dominated by two deposits: Greenbushes in Australia (hard rock) and the Salar de Atacama in Chile (brine), which has two commercial operations on it. SRK estimates that close to 75% of global production was sourced from those two deposits. With lithium prices significantly increasing from 2015 to 2018, two closed mines (Quebec Lithium and Mt. Cattlin) were restarted (although Quebec Lithium recently closed again), one closed mine is in the process of restarting (Jiajika), five mines that produced other commodities either added lithium or restarted as lithium mines (Mibra, Wodgina, Bald Hill, Lanke, and Jintai, although Wodgina and Bald Hill have subsequently closed again), and five new mines have come online (Salar de Olaroz, Mt. Marion, Pilgangoora – Pilbara, Pilgangoora – Altura, and Yiliping). At the same time, the existing operations, including Greenbushes and Atacama, have expanded, but nonetheless, this major increase in supply has reduced the dominance of Greenbushes and Salar de Atacama, which, when combined, SRK estimates will produce approximately 50% of global lithium in 2020.

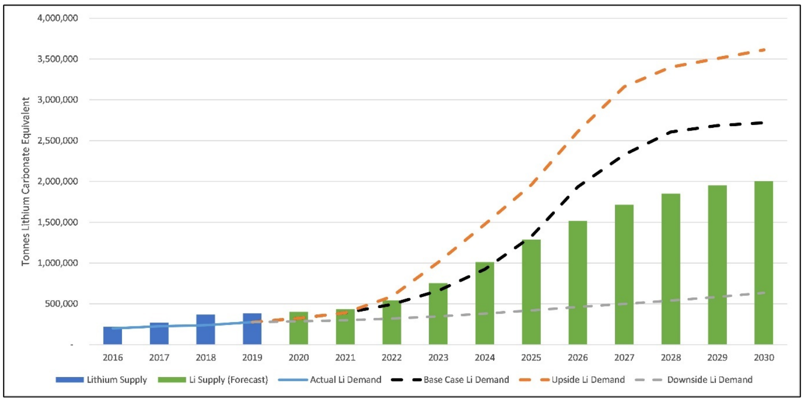
Looking forward, as discussed above, SRK forecasts that demand will grow significantly. However, supply is also rapidly increasing. Based on SRK's knowledge of global lithium projects in development, it forecasts that it is possible for lithium supply to more than double from 2019's production level of about 385,000 t (as lithium carbonate equivalent or LCE) to more than 780,000 t (as LCE) by 2024. This potential growth in supply is limited to projects that are near production (i.e., projects that are either producing, under construction, or at an advanced stage of development, such as operating demonstration plants and at the point of financing construction). Note that while all of these projects are well advanced, with most already being financed and construction underway, if lithium prices stay at current levels, projects in the financing phase may not receive development capital (although SRK has already eliminated those projects it believes will be the most difficult to finance), and some of the higher cost producers may not expand as predicted. Nonetheless, given the demand outlook discussed above, SRK believes it is likely these projects will be incentivized to reach these production levels. Some of this production increase is likely to happen even at current prices (e.g., Salar de Atacama expansions), although other increases will likely only occur if prices increase from current levels. In short, SRK has already discounted ramp-up timing and performance for expected delays and inability to meet targets and has tied project production rates to expected demand growth.

Beyond 2024, the supply pipeline still has remaining development capacity as well. The 2024 forecast of 780,000 t LCE assumes several of the advanced projects are either not producing or not producing at full capacity. In addition, there are further moderate to high quality brine projects that are not included given their long timelines to development. Finally, existing large producers have announced further expansions that are currently on hold and not included.

From a project quality perspective, most of these new developments are likely relatively high-cost producers for lithium carbonate or hydroxide (other than the expansions of existing low-cost producers and a few of the brine projects). This is because most of these projects have been known for many years and have not been developed as they are higher cost, more difficult projects than the existing producers.

16.3 Pricing Forecast

As discussed above, while lithium demand has been increasing (driven by recent historically elevated prices and leading the BEV demand boom), the lithium market is currently in an oversupply situation. In fact, SRK believes this market surplus has been in place since at least 2016. With significant additional production coming online from 2020 through 2025 (projects currently under construction or under financing), demand will have to accelerate its rate of growth to keep up with potential supply. Figure 16-2 presents a comparison of SRK's three demand scenarios against its base-case supply growth forecast.

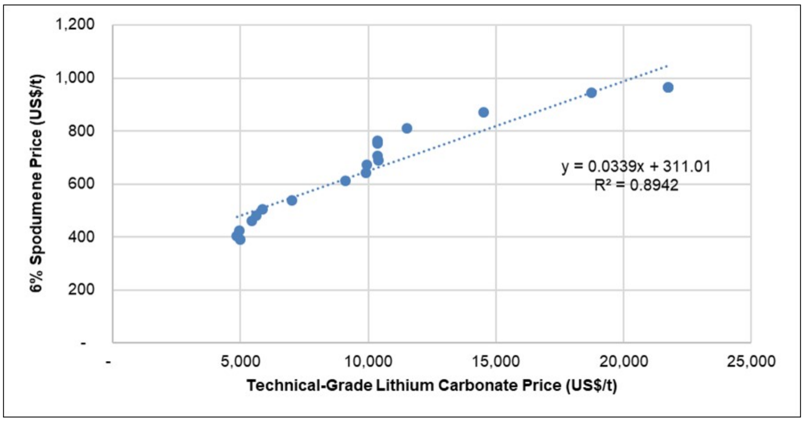


Source: SRK, 2020

Figure 16-2: Supply/Demand Scenarios (2016 to 2023)

Although there is a near-term market oversupply of lithium, in the long-term, even with aggressive supply growth to date, significant new supply will need to be incentivized to fulfill demand requirements for the base-case demand projection. Therefore, in SRK's opinion, the lithium price will need to exceed the production cost for new projects and provide an adequate rate of return on investment to justify development. Overall, SRK believes essentially all lithium producers currently producing or in its supply growth forecast would be profitable at US$9,000/t LCE or less. However, additional projects not in this outlook are clearly needed to meet demand forecasts. Therefore, SRK forecasts a price of US$10,000/t for technical grade lithium carbonate (CIF terms) as its long-term price. This price should be adequate to incentivize all projects included in Figure 16-2 plus additional projects required to close the projected supply gap show in 2023, 2024 and 2025 (many of the earlier stage projects are third to fourth quartile and therefore should be profitable at this pricing level). Due to typical price volatility, SRK expects in the short-term prices may spike well above or fall well below this level, but from an average pricing perspective, in SRK's opinion, this forecast is reasonable.

As applicable to Greenbushes, SRK developed an associated forecast for chemical grade spodumene (6% lithia content, CIF terms). To generate this associated forecast, SRK collected price data from January 2018 through September 2020 for both technical-grade lithium carbonate, from S&P Global (minimum 99%, CIF Asia), and chemical grade spodumene, from Asian Metal (6% lithia grade, CIF China). SRK plotted the data for matching dates on an x-y scatter chart, as shown in Figure 16-3. Based on the relationship between these spot prices, SRK applied a best fit trendline to derive a linear formula representing the relationship between the spodumene price and the technical-grade lithium carbonate price, as shown on the figure. With an R2 value of 0.89, in SRK's opinion, this correlation is robust and a reasonable method to derive the chemical grade spodumene price from the technical grade lithium carbonate price. Based on the formula presented in the figure, a US$10,000/t price for technical grade lithium carbonate results in a chemical grade spodumene (6% lithia) price of US$650/t (again, CIF payment terms). SRK therefore has utilized a spodumene price of US$650/t (6%, CIF) for its long-term price forecast utilized in the reserve estimate.



Source: SRK analysis, pricing data from Asian Metal (spodumene) and S&P Global Market Intelligence (technical grade lithium carbonate)

Figure 16-3: Technical-Grade Lithium Carbonate/Spodumene Price Relationship (2018 to 2020)

In SRK's opinion, this spodumene price is a reasonable representation of potential long-term pricing for the base case supply and demand scenarios outlined above. Given the considerable uncertainty in both timing and magnitude of potential changes to supply and demand, this long-term forecast also has considerable uncertainty and even if supply and demand play out as assumed, SRK expects considerable short-term volatility that will result in prices significantly above or below the long-term forecast price.

16.3.1 Product Sales

Greenbushes is an operating lithium mine. The mine produces a chemical grade spodumene concentrate and a range of technical grade spodumene concentrates. The specifications for the primary product, chemical grade spodumene, which is the focus of this market study, are provided in Table 16-1.

Table 16-1: Chemical Grade Spodumene Specifications

Chemical	Specification	
Li_2O	min.	6.0%
Fe_2O_3	max.	1.0%
Moisture	max.	8%

Source: Talison Shareholders Agreement, 2014

Historic production quantities for chemical grade spodumene concentrate are presented in Table 16-2. In addition, historic consolidated technical grade spodumene concentrate sales are presented for reference.

Table 16-2: Historic Greenbushes Production (Tonnes Annual Production, 100% Basis)

	2015	2016	2017	2018	2019	2020
Chemical Grade Spodumene	351,243	357,018	498,341	565,205	618,896	491,025
Technical Grade Spodumene	86,714	136,795	148,129	158,838	145,676	88,948

Technical grade concentrate tonnage includes SC7.2 (Standard and Premium), SC6.8, SC6.5 and SC5.0 products
Source: Talison Physicals Reporting, 2015-2019

Looking forward, Albemarle has recently significantly expanded its processing capacity with the CGP2 plant coming on-line in 2019. Total forecast production capacity for chemical grade lithium production from the combined CGP1 and CGP2 processing facilities is approximately 1.15 Mt/y (100% basis).

As a chemical grade spodumene concentrate, the primary customer for the product is lithium conversion facilities that convert the spodumene concentrate into various chemical products, including battery grade lithium carbonate and hydroxide that can be utilized as feed stock for electric vehicle batteries (the forecast primary growth market for lithium products). Chemical grade spodumene concentrate is currently fully consumed by the joint venture owners of the operation (i.e., Albemarle and Tianqi/IGO JV) for their downstream conversion facilities. Including the recently expanded production capacity for Greenbushes, Albemarle expects to continue to fully consume its allocated proportion of chemical grade concentrate production from the operation internally.

16.4 Contracts and Status

As outlined above, the lithium chemical grade spodumene concentrate produced by Greenbushes is consumed internally by the current joint venture owners of the operation (Albemarle and Tianqi/IGO JV). The purchase of this concentrate from the Greenbushes operating entity (Talison) is governed by the 2014 joint venture agreement between the two owners. This joint venture agreement establishes that while Albemarle is an owner, it is entitled to take an election of up to 50% of the annual production from Greenbushes, with that election made on an annual basis. The sales price of chemical grade concentrate to Albemarle or Tianqi/IGO JV is based on the market price, as would any third party concentrate sales.

17 Environmental Studies, Permitting, and Plans, Negotiations, or Agreements with Local Individuals or Groups

The following sections discuss reasonably available information on environmental, permitting and social or community factors related to the Project. Where appropriate, recommendations for additional investigation(s), or expansion of existing baseline data collection programs, are provided.

On August 19 and 20, 2020, SRK conducted an inspection of the Greenbushes mine site. This inspection was to confirm the conditions on the mine site and any potentially material information that could affect the mine development. The Project has been in operation as a hard rock mine since 1983 and is fully permitted for its current operations. The Project is in the process of obtaining further approvals for expansion, however consideration of the expansion has been excluded from this evaluation as detailed assessment information is not yet available. This review is compiled from information provided by Talison Lithium Australia Pty Ltd (Talison) and publicly available documents.

Talison holds the mining rights to lithium at the Project, and Global Advanced Metals (GAM) holds the rights to non-lithium minerals. GAM processes tantalum and tin extracted by Talison during mining activities within the Project area under their own Part V Environmental Protection Act 1986 Operating License. GAM is responsible for compliance with their Part V Operating License; however, Talison provides assistance to GAM in the form of environmental monitoring and reporting under a shared services agreement. As GAM operates within Talison-owned mining tenements and Mine Development Envelope (MDE), GAM's compliance with environmental conditions associated with these approvals is the responsibility of Talison.

17.1 Environmental Study Results

The Project is in the southwest of WA in the Shire of Bridgetown-Greenbushes. The town of Greenbushes is located on the northern boundary of the mine. The majority of the Project is within the Greenbushes Class A State Forest (State Forest 20) which covers 6,088 hectares (ha) and is managed by the Department of Biodiversity, Conservation and Attractions (DBCA) as public reserve land under the *Conservation and Land Management Act 1984* (CALM Act). The DBCA manages State Forest 20 in accordance with the Forest Management Plan 2014-2023, that aims to maintain the overall area of native forest and plantation available for forest produce, including biodiversity and ecological integrity. The remaining land in the Project area is privately owned.

The Greenbushes region has been mined for tin, tantalum and lithium since the 1880's, initially by alluvial mining via shafts and sluices and later by dredging of deep alluvium. A smelter and associated crushing and dressing plant was constructed in 1900 and operated for four years, and several treatment plants also commenced operations at the same time (IT Environmental, 1999). Soft rock mining of the weathered pegmatite occurred in the 1970's and was processed at multiple wet and dry treatment plants before being consolidated at a single Integrated Plant site. Hard rock mining commenced in 1983 and a tin smelter, chemical plant and Tailings Retreatment Plant were commissioned at the same time. Over this time, environmental studies and impact assessments have been completed to support project approval applications and these are summarized below.

17.1.1 Flora and Vegetation

The Project is located in the Jarrah Forrest Bioregions under the Interim Biogeographic Regionalization of Australia classification system (Australian Government, 2012). Several flora and vegetation studies have been reported in support of project approvals with the most recent detailed flora and vegetation surveys conducted in spring and autumn 2018 across areas proposed for the mine expansion and access corridors (Onshore Environmental, 2018a; Onshore Environmental, 2018b). A total of nine vegetation types have been mapped in the mining development envelope that consists of two types of *Eucalyptus* Forest, two types of *Corymbia* Forest, *Eucalyptus* Woodland, *Podocarpus* Heath A, *Hypocalymma* Low Heath C, *Melaleuca* Forest and *Pteridium* Dense Heath A, with *Allocasuarina* Forest and Heath reported for the infrastructure corridors for access and pipelines.

No Threatened Ecological Communities, Priority Ecological Communities or threatened flora listed under the federal *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) or the Western Australian *Biodiversity Conservation Act 2016* (BC Act) have been reported in the vicinity of the mine site. The nearest population of threatened vegetation within the Mining Leases identified by Onshore Environmental (2012) are *Caladenia harringtoniae* in M01/3 approximately 560 m west of the southwest in a declared Environmentally Sensitive Area (ESA). One priority flora species (Priority 4 – rare and near-threatened), *Acacia semitrullata*, was recorded by Onshore Environmental in 2018 adjacent to the state forest.

The vegetation condition is predominantly rated as good or very good according to the classification developed by Keighery (1994), with degraded areas typically those that have been logged in the past, areas of historical mine rehabilitation such as gravel pits, and pasture (Onshore Environmental, 2018a). A total of 886 introduced flora species have been reported including three which are Declared Plants under the *Biosecurity and Agriculture Management Act 2007*, Bridal Creeper (*Asparagus asparagoides*), Blackberry (*Rubus anglocandicans*) and Sorrel (*Rumex acetosella*). The Project is located in an area at risk of Dieback (*Phytophthora cinnamomi*) that results in widespread vegetation death. Areas of infestation are known within the mine development envelope and require ongoing management.

17.1.2 Terrestrial and Aquatic Fauna

Terrestrial Fauna

A number of fauna studies have been conducted in support of project approvals, were recently in 2011 and 2018 (Biologic, 2011; Biologic, 2018a; Harewood, 2018). There have been seven conservation significant fauna species recorded in the mine development envelope. Recorded species listed under the EPBC Act includes the vulnerable Chuditch (*Dasyurus geoffroii*), the critically endangered Western Ringtail Possum (*Pseudocheirus occidentalis*), the endangered Baudin's Cockatoo (*Calyptorhynchus baudinii*) and Carnaby's Cockatoo (*Calyptorhynchus latirostris*) and the vulnerable Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*). Species listed under the state's BC Act includes two priority four species, Southern Brown Bandicoot (*Isoodon fusciventer*) and the Western Brush Wallaby (*Notamacropus irma*) and one conservation dependent species, the Wambenger Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*). Additional species that may be present based on desktop assessments but have not been recorded include three mammals, seven birds and one reptile.

The presence of the Black Cockatoos resulted in the determination of the waste rock dump expansion in 2016 to be a ‘controlled action’ under the EPBC Act and was conditionally approved with a requirement for biodiversity offsets and the protection of the habitat of black cockatoos (2013/6904).

Six introduced mammals have been recorded in the mine development envelope, pig (*Sus scrofa*), cat (*Felis catus*), rabbit (*Oryctolagus cuniculus*), fox (*Vulpes vulpes*), house mouse (*Mus musculus*) and the black rat (*Rattus rattus*).

Short Range Endemic (SRE) Species

An SRE study conducted by Biologic (2018a; 2018b) was not able to conclude the regional significance of the 20 specimens collected due to limited available information regarding the taxonomy of species. However, the Jarrah/Marri forest and Jarrah/Marri forest over Banksia which is suitable habitat for SRE species is well represented outside the mine development envelope and SRE species are likely to exist in the surrounding areas as well.

17.1.3 Surface and Groundwater

The region has a Mediterranean climate, with warm dry summers and cool wet winters with average annual rainfall of 820 mm, mainly falling between April and September (Talison, 2019a). The active mining area lies along a topographic ridge which hosts the mineralized pegmatite zone. The majority of the Project is located in the in the Middle Blackwood Surface Water Area. Surface watercourses within the mining leases are all tributaries of the Blackwood River which has the largest catchment in southwest WA, approximately 22,000 square kilometers (km^2) (Centre of Excellence in Natural Resource Management, 2005). The entire river is registered as a significant Aboriginal site (Site ID 20434) that must be protected under the *Aboriginal Heritage Act 1972*.

The topographic ridge diverts surface water to either west into the Norilup Brook sub-catchment or east into the Hester Brook sub-catchment. The Project relies on surface water to supply mining activities, therefore, management of surface water between storage areas is important. The western catchment contains the mine infrastructure, processing plants and TSFs. Surface water in the western catchment is stored in several dams that are part of the mine water circuit and that are impacted by mine waters, the Clean Water Dam, Austin’s Dam, Southampton Dam and Cowen Brook Dam. The Tin Shed Dam is the responsibility of GAM under their operating license. Schwenke's Dam and Norilup Dam are outside of the mining development envelope but can potentially receive water from the mine water circuit as a result of overflows from the Southampton Dam or Cowen Brook Dam respectively. Water discharges from Cowen Brook Dam or Southampton Dam are not permitted. The current Water Management Plan (Talison 2020a) describes the Norilup Brook watercourse as fresh (500 to 1,500 microSiemens per centimeter [µS/cm]). The eastern catchment contains Floyds WRL which impacts the surface water. Discharges are permitted from Floyds Gully (below Floyds WRL) to Salt Water Gully which flows to the Hester Brook and onto the Blackwood River. The Hester Brook watercourse has elevated salinity (1,000 to 5,000 µS/cm).

Groundwater is not a resource in the local area due to the low permeability of the Archaean basement rock, as evidenced by low rate of groundwater ingress (approximately 5 L/s) into the existing Cornwall pit and underground workings (GHD, 2019a). In general, the mine site is underlain by a lateritic weathered basement of clays 15 to 40 m thick that has relatively low permeability (total hydraulic conductivity average 0.05 meters per day [m/d], range from 0.001 to 0.1 m/d) that is interpreted to limit the downward migration of water. Higher permeabilities are inferred to occur where the laterite is vuggy and have been identified from drilling data at the relatively sharp transition between the clays and the oxidized basement rocks (total hydraulic conductivity average 0.3 m/d, range from 0.05 to 1.3 m/d) (GHD, 2019a).

Earlier studies indicated that the pits would overflow to the south approximately 300 years after mine closure (Talison, 2016). Recent pit lake predictive modelling suggests that water levels will stabilize in approximately 500 to 900 years (based on the mine expansion) and that water levels will remain 20 m below the pit limits and will, therefore, not overflow after closure (GHD, 2020).

Paleochannels predominantly of sand between 2 m to 30 m are thick incised into the basement rock traverse the mine development envelope and were dredged as part of historically alluvial mining activities. Low-lying wetlands and surface water within the Project area, including the Austin's and Southampton Dams, are coincident with the paleochannels and indicates a high degree of hydraulic connectivity between surface water and the alluvial material (GHD, 2019a). The channels also occur beneath the TSFs which are unlined and connectivity between the channels and seepage derived from the TSFs was reported by GHD in 2014 (GHD, 2019b).

Groundwater quality is variable across the site based on groundwater quality monitoring and is inferred to be locally influenced by groundwater recharge from surface water, mineralization (resulting in elevated magnesium, carbonate and low pH) or by possible influence of seepage derived from historic mine/dredge workings (GHD, 2019a). Background groundwater quality has been noted as difficult to determine due to a lack of monitoring wells upgradient from the mine, and as monitoring wells are located close to the TSFs and/or in the historically dredged channels (GHD, 2014). Some monitoring wells have been impacted by seepage; however, only one well was determined to be impacted by seepage in 2019, which is a shallow well south of TSF2 (GDH, 2019c).

Downstream surface or groundwater users consist of private rural holdings and State Forest that typically use water for stock, pasture and garden irrigation. Surveys of users with direct access to Norilup Brook and Waljenup Creek confirmed that water is not relied upon as a resource, and the higher salinity of Hester Brook indicates potential for seasonal stock use only (Talison, 2020a). Groundwater may also discharge as baseflow to watercourses in the area and, therefore, supports the ecological values of the Blackwood River (GHD 2019a).

17.1.4 Material Characterization

Several materials characterization studies of waste rock and tailings have been completed since 2000 and includes analysis of the Floyds Dump drainage water quality between October 1997 and May 2013 (GCA, 2014), tailings seepage water quality between 1997 and 2014 (GHD, 2014), and analysis of the potential for acid rock drainage and metal leaching (ARD/ML).

Waste Rock

Studies between 2000 and 2019 indicate:

- Waste rock is not typically acid generating, with average concentrations of 0.1% sulfur of waste rock and 0.006% sulfur for the pegmatite ore (GHD, 2019d). Sulfide-minerals (e.g., pyrrhotite) in the pit waste-zone are sporadic in distribution and invariably occur as trace components (GCA 2014).

- Waste rock that is potentially acid generating (PAG) are the granofels (metasediments) typically located in the footwall of the orebody. The amphibolite and dolerites also contain occasional stringers and pods of sulfides such as pyrite, pyrrhotite and arsenopyrite.
- Significant acid neutralizing capacity (ANC) has been shown to exist in waste rock and pit walls, predominantly in the amphibolite where frequent calcite veins occur (Baker 2014) and, therefore, leaching and mobilization of metals under acidic conditions is considered low risk (GCA, 2014; GHD, 2019d).
- Leachate analysis in 2019 concluded that there is a moderate risk that leaching of metals such as arsenic, antimony and lithium from waste rock, and may be a concern where there is hydraulic connection to groundwater and surface water systems (GHD, 2019d).
- The occurrences of high sulfur lithotypes are estimated to constitute less than 1% of the total volume of waste rock for the current mine plan (GCA, 2014). The mine expansion predicts that 17% of the mined waste rock will be PAG granofels (GHD, 2019d).
- Sulfide oxidation is occurring from Floyds Dump as indicated by the elevated sulfate levels in the drainage water, which correlates seasonally with electrical-conductivity (EC) values within the range 2,500 to 3,500 µS/cm (GCA, 2014). Leach tests on 21 samples in 2019 suggest that elevated sulfate concentrations are due to the presence of granofels (GHD, 2019d).
- A close correlation of leachate-Li and leachate-SO_4 concentrations for a granofels sample tested in 2002 suggests a dependence of Li solubility on sulfide-oxidation (GCA, 2014).

Further studies into the geochemistry of the waste rock are currently underway and should help clarify some of the uncertainties ahead of the proposed mine expansion application planned to be submitted to DMIRS in Q4 2020.

Tailings

The mine produces two grades of lithium oxide for the processing plant: technical grade (greater than 3.8% lithium oxide), and chemical grade (greater than 0.7% lithium oxide). The process water pH is raised to 8 s.u. with the addition of sodium carbonate (Na_2CO_3) prior to deposition in the tailings dams as slurry and ionic ratios provide an indicator to identify seepage. Tailings characterization studies indicate:

- Tailings and ore have a low sulfur content (less than 0.015%) and are without inherent mineralogy that can provide carbonate buffering capacity (GHD, 2016).
- Analysis of tailings assay results (1932 samples) identified that arsenic, cesium, lithium, rubidium, and tungsten were relatively enriched, with tungsten likely to be derived from the tungsten carbide balls in the mill (GHD, 2016).
- An assessment of long-term tailings water quality as measured from decants and ponds were summarized between 2011 and 2014 and indicated that the water is slightly basic, with a dissolved salt content of between 800 and 11200 mg/L and elevated metals such as arsenic, lithium, boron, nickel and zinc (GHD, 2016).
- Specific leaching studies have not been carried out on the tailings and ARD is considered unlikely considering the low sulfur content; however, leaching studies of the ore indicate a moderate risk for leaching of arsenic, antimony, lithium and rubidium under neutral pH conditions (GHD, 2019d).

Soils

Soils have been characterized to consist of lateritic crests and upper hill (1a) slopes of sandy topsoil and gravelly sandy loam that are underlain by caprock at about 550 mm depth, lateritic mid and lower slopes (1b) sandy topsoil over gravelly sandy loam subsoil up to 1,100 mm depth, and sandy lower slopes and flats (2a) grey sand up to a minimum depth of 800 mm over laterite caprock (Talison, 2019a).

Radionuclides

Studies into the potential for radionuclides have consistently returned results that are below trigger values. This includes waste rock and ore samples (GHD, 2019d), radon flux assessments across the mine site (IT Environmental, 1999) and ongoing water monitoring for Radium-226 (Ra-226), and Radium-228 (Ra-228) within 20 monitoring wells, as required for the License.

17.1.5 Air Quality and Greenhouse Gas Assessment

The town of Greenbushes is located on the northern boundary of the mine development envelope, has a population of about 400 people, and includes a primary school approximately 100 m north of the Cornwall pit (currently in care and maintenance) and several rural residences are nearby. The local existing air quality is primarily influenced by mining and to a lesser extent surrounding agricultural activities, vehicle movements, burning (including residential wood burners, bush fires) and mechanical land disturbance (Talison, 2019). Air quality is regulated under the operating License (L4247/1991/13) and monitored by continuous high-volume air sampler with a particle matter (PM_{10}) limit of 90 µg/L at a single location at the boundary between the mine and the town. Dust monitoring results between 2010 and 2019 show that the rare exceedances of the *National Environment Protection (Ambient Air Quality) Measure* (NEPM) limit (50 µg/L averaged over a 24-hour period) were attributed to bushfires and earthworks for water services near the sampler (DWER, 2020). The surface of the tailings is prone to dust generation, and dust is currently managed by a crop of rye grass on TSF1 which is not in use. In 2020, the method of tailings deposition was changed from a single discharge point to multiple spigots around the circumference to help minimize fugitive dust generation. Additional air quality samplers are planned for the monitoring network for the mine expansion and will determine the effectiveness of the new tailings deposition plan, and reduce uncertainties regarding potential exceedances of soluble barium, an issue identified by the Department of Health (DOH), suggesting that more stringent dust management measures may be required to manage dust emissions.

Reporting of greenhouse gas emissions is required annually under the *National Greenhouse and Energy Reporting Act 2007* and emissions reports prepared by show an increase from 60,506 t CO_2-e (Scope 1 and 2) in 2017 to 79,030 t CO_2-e (Scope 1 and 2) in 2019 (Greenbase Environmental Accountants, 2018; Greenbase Environmental Accountants, 2019). These figures are reported publicly, as they exceed the corporate threshold of 50,000 t CO_2-e, and as the project also consumes more than 200TJ energy per year. The current (and predicted emissions for project expansion) Scope 1 direct emissions do not exceed 100,000 t CO_2-e, which is the trigger for assessment under EPA guidelines (EPA, 2020).

17.1.6 Noise, Vibration and Visual Amenity

Due to the proximity of the Greenbushes town to the mine, a safety berm/sound wall has been constructed. The mine is unable to meet the noise limits specified by the *Environmental Protection (Noise) Regulations 1997* (Noise Regulations) and has been granted approval to exceed the limits through the Environmental Protection (Talison Lithium Australia Greenbushes Operation Noise Emissions) Approval 2015 (a Regulation 17 exemption). GAM also operates under an identical approval, and the combined noise emissions cannot exceed the specified limits (Talison, 2019a). There have been no reported noise exceedances in 2018 and 2019 (Herring Storer Acoustics, 2018; Talison, 2019b), one-blasting overpressure non-compliance was reported, and four noise and blasting complaints were received in the 2018 to 2019 Annual Environmental Report period. It was noted in the vibration assessment for the mine expansion that the current monitoring network is prone to false triggers due to the receiver locations. It is recommended that this is reviewed.

The mine and associated light spill are obscured from the town by the safety/ sound barrier; however, several rural residences located east of the mine and some sections of the South Western Highway can see Floyds Dump, a significant feature located between the open pits and the highway. Talison undertakes progressive rehabilitation of the Floyds Dump embankment with only active dumping areas exposed, and currently the mine is screened by the surrounding State Forest and undulating topography (Onshore Environmental 2018c).

17.1.7 Cultural Heritage

The Blackwood River (ID 20434) is the only registered Aboriginal heritage site of significance in the location of the mine and is a site of mythological significance as the home created by the *Waugal* and also a customary path from inland to the coast (Brad Goode & Associates, 2018). Cultural, archaeological, and ethnographic surveys that involved representatives of the Gnaala Karla Booja, South West Boojarah and Wagyl Kaip Native Title Groups, and ethnographic consultation with the nominated Noongar representatives, were conducted in 2015, 2016 and 2018. No sites or artifacts of significance, as defined under section 5 of the *Aboriginal Heritage Act 1972*, were identified (Brad Goode & Associates, 2018).

There are no other cultural sites listed within the mining development envelope, and the nearest heritage sites listed on the *inHerit* database of Western Australia are the Golden Valley Site 7.25 km north east, and the Southampton Homestead approximately 6.5 km west of the mine. Local municipal listed cultural sites include several sites and buildings in Greenbushes town and the South Cornwall Pit (place number 6,639, Category 2) due to the continuous history of mining activity since 1903.

17.2 Environmental Management and Monitoring

The Project operates under approvals that contain conditions for environmental management that include waste and tailings disposal, site monitoring, and water management. Primary approvals are authorized under the federal *Environment Protection and Biodiversity and Conservation Act 1999* (Cwlth) (EPBC Act), the *Environmental Protection Act 1986* (EP Act) including the environmental impact assessment approval for the proposed mine expansion (Ministerial Statement 1111), the operation of a prescribed premises (License L4247/1991/13), approval for the construction and commissioning of a prescribed premises for the proposed mine expansion (W6283/2019/1), and under the *Mining Act 1978* under an approved Mine Closure Plan (Reg ID 60857) and several Mining Proposals (section 17.3).

17.2.1 Environmental Management

The Project has operated using an Environmental Management System (EMS) that has been accredited under ISO 14001 since 2001 (Sons of Gwalia Ltd., 2004). The Project has a Quality Management System accredited under ISO 9001. The EMS was last accredited in February 2020 with no significant issues (Bureau Veritas 2020) and key environmental management plans (EMP) must also be reviewed and approved by the regulatory bodies (under approval conditions):

- Conservation Significant Terrestrial Fauna Management Plan (Ministerial Statement 1111),
- Visual Impact Management and Rehabilitation Plan to minimize visual impacts including light spill (Ministerial Statement 1111),
- Disease Hygiene Management Plan to minimize impacts to flora and vegetation, including from marri canker and dieback (Ministerial Statement 1111),
- Water Management Plan (License L4247/1991/13),
- Noise Management Plan (*Environmental Protection (Talison Lithium Australia Greenbushes Operation Noise Emissions) Approval 2015*), and
- Dust Management Plan reviewed by the Department of Water and Environmental Regulation (DWER).

It was noted in the EPA's environmental impact assessment report for the proposed expansion (2019) that the mine "has been operating since 1983 with no significant impacts to the environment having occurred as a result of activities at the Mine during this time."

Additional management plans include:

- Waste Minimization and Management Plan
- Hydrocarbon Management (Storage, Disposal and Maintenance and Cleanup Plans)
- Emergency Management Plan (and location specific Emergency Repossess Plans)

17.2.2 Tailings and Waste Disposal

Tailings Disposal

Tailings are disposed of as a slurry from the processing plant into the active TSF2 under the Operation Manual – Tailings Storage Facility (Talison, 2020). TSF1 commenced operations around 1970 (GHD, 2014) and was originally used for tin mining operations prior to the 1990's, and later for hard rock mining tailings deposition until 2006 (Talison, 2011). TSF1 is currently covered with rye grass to minimize dust. TSF3 is currently partially rehabilitated and was originally used for tantalum tailings. All the TSFs are unlined.

- The tailings dams have been classified in accordance with ANCOLD guidelines (2012) as Significant for TSF1, High C for TSF 2 and Low for TSF2, and that Hazard Rating for all three TSFs are Category 1 in accordance with the Code of Practice for Tailings Storage Facilities in Western Australia (DMP, 2013).
- The emergency actions and response plans for the TSFs are defined using Trigger Actions Response Plans for actions to be taken at different escalation levels for flooding, seepage, embankment instability or damage and earthquake scenarios.

- Seepage was identified in the shallow aquifer (paleochannels) in six bores; however, the deep aquifer was not impacted (GHD, 2014). Recent monitoring data only confirm one well.
- Seepage from the western embankment of TSF2 has been reported in the AERs since 2015. Significant works have been undertaken since 2017 to install buried pipe collector drains that transport the seepage to the mine water circuit. The requirement for ongoing active seepage management is due to the location of the TSF over the shallow sand aquifer/paleochannels.
- The tailings deposition strategy was updated in the winter of 2020 to include multiple spigots around the circumference of TSF2 to minimize dust generation during the summer months.
- Tailings deposited in TSF3 have been classified as predominantly NAF, with small quantities of PAG material generated as a result of sulfide flotation concentrate. Management of the small quantities of PAG material was by co-disposal with the NAF material (GCA, 1994).
- TSF3 has already been closed and partially rehabilitated. On closure, the TSFs will be capped, landscaped, and rehabilitated. The final design is not yet determined.

It is recommended that the closure designs or the TSFs are undertaken as soon as possible. It is possible that this will be addressed in the upcoming revision of the Mine Closure Plan (due to be completed in Q4 2020).

Waste Rock Disposal

Potentially hazardous waste rock has been managed on the site since 2003, whereby waste rock with a sulfide content greater than 0.25% is segregated for special treatment, and in 2014 it was estimated that approximately 1% of samples of waste met this criterion (Baker, 2014). The site currently manages waste rock under the Waste Rock Management Plan (OPM-MP-11000, issued 2020) and Environmentally Hazardous Waste Rock Management (GEO-PR-2024, issued 2018). Waste rock with a sulfide content greater than 0.25% or arsenic content greater than 1.000 ppm is segregated with high sulfide material encapsulated in an unlined cell in the center of Floyds Dump, and material containing high arsenic is sent to the TSF. Historically, high arsenic material was sent to the Integrated Plant (IP) Waste Rock Dump which is no longer active (IT Environmental, 1999). The embankments of Floyds Dump are regraded to 18° batters and covered with topsoil or weathered growth media for rehabilitation.

17.2.3 Water Management

The Project is reliant on surface water and operates under a holistic Water Management Plan (WMP) which has been revised to include the current approval conditions for the mine expansion (Talison, 2020). The mine water circuit operates as a closed system and is comprised of the four primary storage dams (Southampton Dam, Austin's Dam, Clear Water Dam, Cowen Brook Dam), the TSF2 decant (Clear Water Pond), pits, seepage drains, collection sumps and associated pipelines and pumps. The Project is currently upgrading the water circuit with the installation of additional pipeline tracks which will permit the movement of water between all the primary water storages to manage levels during periods of high rainfall. Contaminated water and seepage are pumped to the Clear Water Dam which is the primary source of water for the adjacent processing plants. The Cornwall Pit and Vultan Pit are currently being used for water storage, but this will change with the proposed mine expansion.

Water levels and quality are monitored throughout the water circuit, as per the conditions of the license (L4247/1991/13). The primary source of arsenic in the mine water circuit was historically from tantalum processing activities and was contained within the Tin Shed Dam under GAM's responsibility, with some precipitation into dam sediments (Talison, 2017). Current arsenic and lithium sources are from lithium processing and pit dewatering. Over time, the water quality of the mine water circuit has shown increasing levels of arsenic and lithium. In 2014, arsenic remediation units (ARU) were established to manage arsenic concentrations which have now stabilized below license limits, and the ARUs have recently been replaced with a larger capacity unit. Lithium concentrations are planned to be managed at a Water Treatment Plant (WTP), currently being commissioned, which will remove lithium by reverse osmosis and is located at the Clear Water Dam.

Offsite discharge of water from the Southampton Dam and the Cowan Brook Dam is explicitly prohibited in the license due to potential downstream receptors from the accumulation of lithium and metals/metalloids in the mine water circuit, and connection to seepage from TSF2 via the underlying aquifer. Prior to 2018, discharges were permitted from the Cowen Brook Dam and typically occurred during the winter months. Talison anticipates that water treatment will improve the quality of water to acceptable discharge levels in the future. Discharge is permitted from emission points specified in the license (L4247/1991/13) and Works Approval (W6283/2019/1) which are Floyds North and Floyds South (adjacent to Floyds Dump), Carters Farm and Cemetery.

There has been no predictive modeling of the pit lake quality as far as SRK is aware, and this is recommended to inform closure management strategies. There is potential for site water management to be required post-closure until seepage from TSF2 attenuates.

17.2.4 Solid Waste Management

Talison is required under license (L4247/1991/13) to dispose of solid waste in the waste rock dump by landfill (no more than 200 t) or by burial (batches of no more than 1,000 whole tires), or at a licensed third party premises. Talison was non-compliant with the landfill criteria in the 2018-2019 AER period due to increased operations and have stated that they are seeking to amend the license conditions.

17.2.5 Environmental Monitoring

Specific requirements for compliance and ambient monitoring are defined in the license (L4247/1991/13) and Works Approval (W6283/2019/1). The monitoring results must be reported to the regulators (DWER and DMIRS) on an annual basis and include point source emissions to surface water including discharge and seepage locations, process water monitoring, permitted emission points for waste discharge to surface water, ambient surface water quality and ambient groundwater quality monitoring, ambient surface water flow and each spring, complete an ecological assessment of four sites upstream and six sites downstream of the Norilup Dam.

17.3 Project Permitting Requirements

17.3.1 Legislative Framework

Australia has a robust and well-developed legislative framework for the management of the environmental impacts from mining activities. Primary environmental approvals are governed by the federal EPBC Act and the environmental impact assessment process in Western Australia is administered under Part IV of the *Environmental Protection Act 1986* (EP Act). Additional approvals in Western Australia are principally governed by Part V of the EP Act and by the *Mining Act 1978* (Mining Act) as well as several other regulatory instruments.

17.3.2 Primary Approvals

The Project is currently approved under the EPBC Act and Part IV of the EP Act.

Environmental Protection and Biodiversity and Conservation Act 1999 (Cwlth)

The Project was referred to the federal Department of Environment and Heritage (now called the Department of Agriculture Water and the Environment – DAWE) under the EPBC Act in 2013 for expansion of the waste rock dump, and in 2018 for further expansion of the waste rock dump and tailings storage facilities. The works were determined to be a 'controlled action' due to potential impacts to listed threatened species and ecological communities and was approved with conditions for biodiversity offsets and to protect the habitat of black cockatoos (2013/6904 and 2018/8206).

Part IV, Environmental Protection Act 1986 (WA)

The principal legislative framework in Western Australia for environmental and social impact assessment is the EP Act. Approvals under Part IV of the EP Act are made by the Environmental Protection Authority (EPA), an independent statutory authority. Under the EP Act, projects that have to potential to cause significant impacts to the environment are referred to the EPA which determines if a proposal should be formally assessed. At the completion of the Part IV assessment process, the EPA provides advice to the Minister for the Environment who then issues a Ministerial Statement if the proposal is approved. The current operations have not required approval under part IV of the EP Act. The proposed mine expansion has been approved, and the Project now operates under Ministerial Statement 1111 (MS1111).

17.3.3 Other Key Approvals

Part V, Environmental Protection Act 1986 (WA)

The Department of Water and Environmental Regulation (DWER) administers Part V, Division 3 of EP Act, which involves the regulation of emissions and discharges from 'Prescribed Premises' as defined by the Environmental Protection Regulations 1987 (Schedule 1). Mining is not a prescribed activity; however, pit dewatering, ore processing, storage of tailings, crushing and screening, and power generation are among the prescribed activities regulated by the DWER.

A license is required for the operation of Prescribed Premises. Talison holds License No. L4247/1991/13, which was granted on December 12, 2013, was last amended July 27, 2021 and is valid until December 13, 2026. The license authorizes operation of Category 5 Prescribed Premises, processing or beneficiation of metallic or non-metallic ore up to 4.7 Mt/y of processing capacity and 5 Mt/y deposited tailings. The site operates two chemical grade processing plants (CGP 1 and 2) and one TSF (TSF2). TSF3 is closed has been rehabilitated and TSF1 is not currently receiving tailings and is approved for use only for emergency deposition.

Off-site discharge of water from the Southampton Dam and the Cowan Brook Dam is explicitly prohibited in the license due to the high risk from accumulation of lithium and metals/metalloids in the mine water circuit.

A Works Approval (W6283/2019/1) was granted on April 2, 2020 for the construction and commissioning of additional processing plants, a crusher and a tailings retreatment plant to increase the processing capacity of spodumene ore to a maximum of 11.6 Mt/y, and the Project's current management and operating strategies include compliance with the conditions of the Works Approval.

Clearing permits are required for the disturbance of native vegetation under the EP Act. Talison holds two clearing permits, CPS 5056/2 valid until December 27, 2026 for clearing up to 120 ha for mine disturbances and CPS 5057/1 valid until December 27, 2026 for clearing up to 10 ha for rehabilitation purposes outside the mine development envelope. Offset proposals are required under these permits to address residual impacts to the Forest Red-tailed Black Cockatoo, Baudin's Cockatoo and Carnaby's Cockatoo.

Mining Act 1978 (WA)

The environmental impacts of mining and related activities are also assessed by the Department of Mines, Industry Regulations and Safety (DMIRS), the statutory body for the regulation of mineral exploration and associated resource development activities. Environmental and social assessment requirements are defined by the Statutory Guideline for Mining Proposals and the Statutory Guidelines for Mine Closure Plans which are enabled under section 70O of the Mining Act and the MCP must be revised a minimum of every three years. The commitments made in mining proposals for a project generally accrue rather than superseding each other, so that obligations arising from earlier approvals become binding. The applicable mining proposals and MCPs are shown in Table 17-1.

A Mining Proposal and MCP must be approved by the DMIRS before mining activities commence and must contain a description of all the relevant environmental approvals and statutory requirements that must be obtained and that will affect the environmental management of the Project. A Memorandum of Understanding (MoU) exists between the DMIRS and other regulatory agencies to minimize duplication of effort and to enable consultation in cases where expertise relating to a particular type of impact resides with another agency.

Table 17-1: Mining Proposals and MCPs Conditioned in Mining Tenure

Registration ID	Document Title	Date	Applicable Tenure
14168	Greenbushes Notice of Intent: Greenbushes Tantalum/Lithium Project: Greenbushes, Western Australia	April 1991	M01/16
2122/92	Notice of Intent to build an additional waste dump for material form the Tantalum and Lithium Pits at the Greenbushes Minesite	13 July 1993	M01/16
15064	Proposed construction of Lithium carbonate Plant - Greenbushes Mine	21 June 1994	M01/16
16518	Greenbushes Operations - Preliminary Project Proposal - Continuation of Hard Rock Mining	March 1999	M01/16
45382	Greenbushes Operations 2013 Mining Proposal - Continuation of Hardrock Mining III	9 April 2014	M01/03, M01/16, G01/1
EARS-MP-30733	Talison Lithium Australia Pty Ltd Greenbushes Mine Site Project 640 2011 Lithium Processing Plant Upgrade Tenement G01/1	June 2011	G01/1
60857	Talison Lithium Australia Pty Ltd - Greenbushes Operations Mine Closure Plan 2016	23 February 2017	M01/1, M01/02, M01/03, M01/4, M01/5, M01/8, M01/10, M01/16, M01/18, G01/1
80328	Mining Proposal - Expansion of Mine Development Envelope, Mine Services Area, Chemical Grade Plant 3, 4, Mine Access Road and Tailings Retreatment Plant	23 July 2019	M01/03, M01/8
87604	Infrastructure and road works at the new site Explosives Magazine and Batching Facility	23 June 2020	M01/03
95694	Mine Services Area, Gate 5 and 132kV powerline corridor	30 April 2021	M01/03, M01/06, M01/09
96748	TSF2 buttressing and ground stabilization works	14 July 2021	M01/06

Source: Talison Lithium Australia Pty Ltd., 2019.

Aboriginal Heritage Act 1972 (WA)

The *Aboriginal Heritage Act 1972* (AH Act) provides for the protection of all Aboriginal heritage sites in Western Australia regardless of whether they are formally registered with the administering authority, the Department of Planning, Lands and Heritage (DPLH). Overall, the surveys have not identified any heritage sites and, therefore, Section 18 consents are not required at this time.

Contaminated Sites Act 2003 (WA)

The Project has five registered contaminated sites which encompass the entire mine area due to known or suspected contamination of hydrocarbons and metals in soil, and elevated concentrations of metals in groundwater and surface water (Site IDs 34013, 73571, 73572, 75019, and 75017). The classification of the Mine as ‘Contaminated – Restricted use’ restricts land for commercial and industrial uses only. The mine cannot be developed for more sensitive uses such as recreation open space or residential use without further contamination assessment and/or remediation.

17.3.4 Environmental Compliance

The Project has not incurred any significant environmental incidents (EPA, 2020). Reportable incidents in the 2018-2019 AER period totaled 85 incidents and consist primarily of spills (44), followed by water or tailings incidents (18), flora and fauna incidents (16) and dust incidents (11). Complaints comprised four complaints for noise and blasting, one dust complaint, one light complaint, and one odor complaint.

DWER note in the Works Approval decision report (2020) that there have been 36 dust related complaints since the 2015/2016 reporting period; however, dust monitoring for license L4247/1991/13 from previous years (2010-2019) confirms consistent dust measurements well below the NEPM standard, with results over 50 $\mu g/m^3$ observed on only very rare occasions.

The Project has contaminated five sites listed which encompass the entire mine area due to known or suspected contaminated site due to hydrocarbons and metals in soil, and elevated concentrations of metals in groundwater and surface water (Site IDs 34013, 73571, 73572, 75019, and 75017). These sites are classified as “Contaminated – Restricted use” and only permit commercial and industrial uses. This will need to be reviewed for final land use options for closure.

17.4 Local Individuals and Groups

The mining tenure for the Project was granted in 1984 and, therefore, is not a future act as defined under the *Native Title Act 1993* (a 'future act' is an act done after the January 1, 1994, which affects Native Title). The Project is, therefore, not required to have obtained agreements with the local native title claimant groups.

The Project lies immediately south of the town of Greenbushes and maintains an active stakeholder engagement program and information sessions to groups such as the “Grow Greenbushes.” Senior mine management resides in the town. Talison promotes local education (the Greenbushes Primary School and tertiary sponsorships) and provides support community groups with money and services (allocated in the Environmental and Community budget).

Talison has two agreements in place with local groups:

- Blackwood Basin Group (BBG) Incorporated – offset management agreement whereby BBG have agreed to manage and improve the condition of native vegetation for the purpose of the Black Cockatoo offset requirements.
- Tonebridge Grazing Pty Ltd. – site conservation agreement for the protection and improvement of native vegetation to protect Black Cockatoo habitat.

17.5 Mine Reclamation and Closure

17.5.1 Closure Planning

The requirements for Mine Closure Plans (MCPs) in Western Australia are defined in the Mining Act 1978 and the Guidelines for Preparing Mine Closure Plans (Department of Mines and Petroleum & Environmental Protection Authority [DMP & EPA], 2015) which is statutory guidance under s70O of the Mining Act. Talison has a mine closure plan submitted and approved by DMIRS on 23 February 2017, with their costs updated in October 2016.

Talison states in their currently approved MCP that the closure concept for the Greenbushes site is to re-integrate the mine into the surrounding State Forest. All of the project facilities would be part of the re-integration including artificial landforms such as tailings storage, two contoured waste rock dumps and a large pit void. The pit is expected to fill with water to an elevation that would cause it to overflow at the southern end into the Hester Brooke Catchment.

Based on progressive rehabilitation that has been performed at the site, Talison believes that the rehabilitated landscape will be stable and non-polluting. However, the site is currently classified as

Contaminated: restricted use and water from several areas does not meet current discharge criteria. Talison has stated this does not impact the proposed use to allow native fauna and general public to conduct normal activities.

Talison has developed a closure completion criterion for the return of historic areas to the state forest after rehabilitation, specifically historic shallow alluvial workings along gullies surrounded by forest. The post mining landforms associated with the active mine site have less in common with the pre-mining surrounding environment. Talison is working with the Department of Biodiversity, Conservation and Attractions (DBCA) on the development of a completion criteria for the active mine site, with the closure criteria still in early draft stage, with further negotiation needed with DBCA before final criteria can be agreed on.

The Broad Principal Closure Objectives are

- Post mining land use has been identified and is compatible with the surrounding land use
- Post mining land use is achievable and acceptable to the future landowner/manager
- The Environment is safe, non-polluting and stable and will not be the cause of any environmental or public safety liability and has an acceptable contamination risk level for the intended land use
- Potential hazardous substances are removed from site and/ or the location of buried or underground hazards is defined and adequately demarcated
- The Environment can be integrated into the post closure management practices without the input of extraordinary resources above that which could reasonably and normally be expected, unless otherwise agreed by the future landowner.
- The Environment is able to support functional landforms, soil profiles, ground and surface water systems and ecological communities for the agreed post mining land-use.
- Any built infrastructure is removed, unless otherwise agreed by the future landowner / manager and so long as the maintenance of the infrastructure is not inconsistent with all these objectives.

The approved closure plan is based on 11 domains, with Talison responsible to all facilities but two, with the responsibility falling on to Global Advanced Metals Greenbushes (GAMG) who have the rights to the non-lithium minerals and ownership of the Tantalum processing facilities.

Domains and subdomains and infrastructure are summarized in Table 17-2.

Table 17-2: Reclamation and Closure Domains and Responsibilities

Talison Domain	
Pit Domain	**Floyds Waste Dump**
Central pits	Waste landform
Haul Roads	Haul roads
Tantalum Ore Stockpiles	Magazine
Portal	Hardstand areas
Powerlines & transformers	Powerlines
Water Pipelines	Monitored Rehabilitation
Monitored Rehabilitation	Natural regrowth/Unmonitored rehabilitation (disturbed but not assigned
Natural regrowth/Unmonitored rehabilitation (disturbed but not assigned	Remnant vegetation
Remnant vegetation	
IP Waste Dump Domain	**Water Circuit Doman**
IP Waste landform	Austins/Southampton Dam
Rehabilitation soil stockpiles	Cowan Brook Dam
Haul roads	Water pipelines
Mining Contractors workshop	Raw water tanks
Drill & blast workshop	Austins Wetland
Offices	Pumping stations
Bioremediation area	Powerlines & transformers
DG Storage-Mining contractors fuel farm	Monitored Rehabilitation
Lithium tailings (Historic)	Natural regrowth/Unmonitored rehabilitation (disturbed but not assigned
Hardstand areas	Remnant vegetation
TSF Domain	**Vultan Domain**
TSF1	Vultans Wetland
TSF2	Historic tailings
Clear water pond	Powerlines & transformers
TSF3	Monitored Rehabilitation
Tailings pipelines	Natural regrowth/Unmonitored rehabilitation (disturbed but not assigned
Powerlines	Remnant vegetation
Pumping station	
Lithium Processing Domain	**TSF 3 Domain**
Technical Grade Lithium Production Plant	Historic tailings rehabilitated
Chemical Grade Lithium Production Plant	Historic tailings no rehabilitated
Engineering workshop	Monitored rehabilitation
Light vehicle workshop	Natural regrowth/Unmonitored rehabilitation (disturbed but not assigned
Underground cables	
LMP Warehouse & Offices	**Administration Domain**
DG Storage - Light vehicle fuel farm	Administration offices
DG Storage - LMP gas storage	Laboratory
DG Storage - Sulphuric acid tank	Research facility
Powerlines	Hardstand areas
Transformers & substations	Access roads.
Hardstand areas	
GAMG Domains	
GAMG Primary Domain	**GAMG Secondary Domain**
Crushing facility	Wet and Dry plant
Primary tantalum plant	Roaster/Smelter
Run of Mine pad	Arsenic Remediation Facility
Fine ore stockpile	Settling pond
Hardstand areas	Tin shed dam
Water Pipelines	DG Storage - Arsenic trioxide fume storage
	Gas storage
	Pumping station
	Powerline & transformers
	Administration offices & store
	Product storage warehouse
	hygiene facility
	Access roads

Post closure activities will comprise of a 10-year monitoring schedule for the following:

- Surface water flows
- Monthly water quality
- Ground water monitoring
- Dust monitoring
- Monthly TSF inspections and seepage checks
- Annual TSF geotechnical reviews
- Pit wall stability
- Pit void water levels
- Weed monitoring
- Flora and fauna assessments
- Monthly rehabilitation slope stability
- Feral animal monitoring
- Monthly water dam inspections

Proposed monitoring methods must be able to demonstrate trends towards the agreed site-specific completion criteria and environmental indicators for a sufficient timeframe.

17.5.2 Closure Cost Estimate

Financial provision for MCPs are required to be prepared with transparent and verifiable methodology with uncertainties and assumptions clearly documented (DMP & EPA, 2015). A cost estimate for immediate (unplanned) closure of Greenbushes has been prepared by Talison using the Victorian Government Rehabilitation bond calculator (dpi-bond-calculator-24-feb-2011) as a template to assist them in identifying and costing the rehabilitation, decommissioning and monitoring requirements for the Greenbushes site. As stated within their closure plan, Talison's initial closure costs were calculated in 2013, with these costs escalated annually using Perth, Western Australia inflation rates. The Victorian Government bond calculator uses predefined third-party unit rates based on the typical current market 'third party rates' as of July 2010, which may overestimate or underestimate closure costs for Western Australia. Where more accurate costing information was available, that was used in lieu of the default third party rate as prescribed in the Victorian bond calculator. A more accurate closure cost estimate should be prepared using Western Australian third-party rates or quoted estimates based on 'first principles'.

The 2021 closure cost estimate update is AU$48,757,253, of which AU$48,757,253 represents the estimate for Talison's portion of the operation.

The closure cost estimate for Greenbushes only addresses immediate mine closure. SRK was not provided a Life of Mine (LoM) closure cost estimate, which, although not a regulatory requirement, is industry best practice and consistent with sustainable development goals (Department of Industry, Innovation and Science, 2016). The LoM closure costs include rehabilitation, closure, decommissioning, monitoring and maintenance following closure at the end of the mine life and are typically much higher than the immediate closure due to a greater final footprint. Early recognition of mine closure costs aids financial planning, long term budgeting and mine plans and promotes improved strategies for progressive rehabilitation. It provides a more accurate representation of the total closure liability for the Greenbushes operation.

17.5.3 Performance or Reclamation Bonding

Western Australia does not require a company to post performance or reclamation bonds. However, all tenement holders in Western Australia are required to annually report surface disturbance and to make contributions to a pooled mine rehabilitation fund (MRF) based on the type and extent of disturbance under the *Mining Rehabilitation Fund Act 2012* (MRF Act). Each operator supplies the areas of disturbance for each facility type and a standard rehabilitation cost is applied to each. Therefore, the cost used to estimate the annual contribution to the MRF may not reflect the actual cost to close the mine as it does not use site-specific information and is unlikely to include all of the activities that would be required to close the mine. The pooled fund can be used by the Department of Mines, Industry Regulation and Safety (DMIRS) to rehabilitate mines where the tenement holder/operator has failed to meet their rehabilitation obligations and finances have not been able to be recovered. The interest earned on the pooled fund is used for administration and to rehabilitate legacy abandoned mine sites.

However, the *Mine Closure Plan Guidance - How to prepare in accordance with Part 1 of the Statutory Guidelines for Mine Closure Plans* (DMIRS, March 2020) states that “DMIRS may require a fully detailed closure costing report to be submitted for review, and/ or an independent audit to be conducted on the report to certify that the company has adequate provision to finance closure. Where appropriate, the costing report should include a schedule for financial provision for closure over the life of the operation.” If requested by DMIRS, tenement holders are required to provide financial assurance for mine closure to ensure that adequate funds are available and that the government and community are not left with unacceptable liabilities. The financial assurance process and methodology must be transparent and verifiable, with assumptions and uncertainties that have to be clearly documented, and based on reasonable, site-specific information. As of the preparation of this report DMIRS has not requested that Talison provide financial assurance for the Greenbushes operation, but Talison does submit annual payments to the MRF in accordance with the MRF Act.

17.5.4 Limitations on the Current Closure Plan and Cost Estimate

The latest closure cost estimate available for review was the 2021 updated estimate. It includes the facilities that currently exist on site and future expansion of Floyd’s dump.

The model used to prepare the closure cost estimate was developed in the State of Victoria. Its purpose is to provide the Victorian government with an assessment of the closure liabilities at the site and form the basis of financial assurance. However, because Western Australia does not require operators to post a financial assurance and, instead relies on a pooled fund, it is believed this cost estimate has not been reviewed by the Western Australian government. Furthermore, this model was created in 2011 and uses fixed unit rates developed by a consultant to the government. These rates have been increased for inflation since that time.

Talison used this model to prepare a cost estimate in the event that the government requires demonstration of adequate financial assurance for the site. This type of estimate typically reflects the cost that the government agency responsible for closing the site in the event that an operator fails to meet their obligation. If Talison, rather than the government, closes the site in accordance with their current mine plan and approved closure plan, the cost of closure is likely to be different from the financial assurance cost estimate approved by the government.

There are a number of costs that are typically included in the financial assurance estimates that would only be incurred by the government, such as government contract administration. Other costs, such as head office costs, a number of human resource costs, taxes, fees and other operator-specific costs that are not included in the financial assurance cost estimate would likely be incurred by Talison during closure of the site. Because Talison does not currently have an internal closure cost estimate other than the Victorian model, SRK was not able to prepare a comparison of the two types of closure cost estimates. The actual cost could be greater or less than the financial assurance estimate.

There is no documentation on the basis of the unit rates used in the Victorian model and the government of Victoria was unable to provide any information regarding the accuracy of the rates. Because of this, SRK cannot validate any of the unit rates used in the model or the overall cost estimate.

Furthermore, because closure of the site is not expected until 2057, the closure cost estimate represents future costs based on current site conditions. In all probability, site conditions at closure will be different than currently expected and, therefore, the current estimate of closure costs is unlikely to reflect the actual closure cost that will be incurred in the future.

17.5.5 Potential Material Omissions from the Closure Plan and Cost Estimate

As noted above, the closure plan and current cost estimate is based on the assumption that the mine site will be stable and non-polluting following completion of the closure measures included in the closure plan. However, there are several aspects of the project that may require additional measures to be implemented at the site to achieve this goal.

Currently, the site must treat mine water collecting in the Southampton and Cowan Brook Dams prior to discharge due to elevated levels of arsenic and lithium in the water. The sources of elevated lithium and arsenic in the mine water circuit include dewatering water from the pit. However, there has been no study to determine if water that will eventually collect in the pit or from any other point source and discharge will meet discharge water quality standards. Therefore, no assessment of the probability that post-closure water management or water treatment has been performed.

Additionally, contaminated seepage from TSF2 has recently been observed in the alluvial aquifer and is now being collected via French drains constructed along the toe of the embankment and conveyed to the water treatment plant. At this time, no studies have been conducted to determine the cause of the current seepage, the likelihood and duration of continued seepage, or the possibility that additional seepage could occur from the other TSF facilities.

If perpetual, or even long-term, treatment of water is required to comply with discharge requirements, the closure cost estimate provided by Talison could be materially deficient.

17.6 Adequacy of Plans

In general, current plans are considered sufficient to address any significant issues related to environmental compliance, permitting, and local individuals or groups. Additional studies such as waste rock characterization, noise and dust monitoring, mine closure are recommended for the proposed mine expansion.

17.7 Commitments to Ensure Local Procurement and Hiring

The Project has no formal commitments to ensure local procurement and hiring. However, the mine applies a fatigue management policy that requires staff to have a maximum workday of 13 hours that includes travel to and from home (Distance from Work ADM-ST-014, 2018). Staff operating on a 12-hour workday must live within a 30-minute drive of the mine (approximately 50 km), and those on an 8-hour workday must live within 1.5 hours of the mine site (approximately 120 km). This policy limits the radius of staff employment to the local region, with the majority of staff residing within 50 km.

18 Capital and Operating Costs

Estimation of capital and operating costs is inherently a forward-looking exercise. These estimates rely upon a range of assumptions and forecasts that are subject to change depending upon macroeconomic conditions, operating strategy and new data collected through future operations. For this report, capital and operating costs are estimated to a PFS-level with a targeted accuracy of +/- 25%. However, this accuracy level is only applicable to the base case operating scenario and forward-looking assumptions outlined in this report. Therefore, changes in these forward-looking assumptions can result in capital and operating costs that deviate more than 25% from the costs forecast herein.

18.1 Capital Cost Estimates

Summary LoM capital costs are shown in Table 18-1.

Table 18-1: Life-of-Mine Capital Costs

Category	LoM Cost(AU$ million)	Distribution(%)
Expansionary Development	68.85	8%
Plant & Equipment Sustaining	151.28	17%
Sustaining Development	33.04	4%
Tailings Addition	43.70	5%
Exploration	11.15	1%
Plant & Equipment	557.28	61%
Closure	48.76	5%
Total	**914.05**	**100%**

Source: SRK, 2021

Total LoM capital expenditures are estimated at AU$914.1M. Talison classifies capital expenditures as either expansionary or sustaining. A discussion of both types of capital expenditures is presented below.

18.1.1 Expansionary Capital Costs

Planned LoM capital expenditures that are characterized as expansionary are shown in Table 18-2.

Table 18-2: Life-of-Mine Expansionary Capital Costs

Category	LoM Cost (AU$ million)
Development	
Water Capacity	4.2
Capacity Increase and Approved Capital	8.7
TSF 4	56.0
Plant & Equipment	
132kV Power Line	15.3
Mine Services Area (MSA)	88.8
Mine Access Road	7.2
Explosives Facility	0.3
Clearing Offsets	20.0
Greenbushes Housing	0.5
TSF Pumping & Distribution	7.4
Warehouse Workshop Expansion	7.0
Lab Expansion	4.9
Total Expansionary Capital	**207.3**

Source: SRK, 2021

LoM expansionary capital expenditures are estimated at AU$207.3M, with approximately AU$63M directly attributable to constructing tailings storage facilities. Other significant expenditures include relocation of a 132 kV power line and completion of a new mine services area and clearing offsets. SRK's review of the Talison capital expenditure buildups confirmed that the estimates typically include contingency. The contingency is embedded within the line-item expenditures in Table 18-2. SRK review indicates that all contingency amounts were less than 15%.

18.1.2 Sustaining Capital Costs

Planned LoM capital expenditures that are characterized as sustaining are shown in Table 18-3.

Table 18-3: Life-of-Mine Sustaining Capital Costs

Category	LoM Cost (AU$ Million)
Development	
Cutback Preparation Works	2.4
TSF2	13.8
Floyds Preparation Works	14.4
Floyds Catchment System	2.5
Exploration	
Drilling	11.2
Plant & Equipment	
Fleet Management System	2.2
CGP2 CAPEX Adder	75.0
LIBS Online Analyzer	2.0
CGP1 Sinks Iron Removal	5.0
TGP Thickener	6.0
Technical Team Office	2.0
Moisture Reduction Systems	1.6
Other Sustaining (LoM)	463.4
Closure	48.8
Total Sustaining Capital	**650.3**

Source: SRK, 2020

LoM sustaining capital expenditures are estimated at AU$650.3M, including estimated closure costs. The assumption is that Talison will continue to rely on a contractor for open pit mining and, accordingly, no mining equipment costs have been included in the sustaining capital cost estimate. No contingency is included in the sustaining capital shown in Table 18-3.

18.2 Operating Cost Estimate

The LoM operating costs are summarized in Table 18-4. The LoM total operating costs are summarized in Table 18-3. No contingency is included in the operating cost estimates.

Table 18-4: Life-of-Mine Total Operating Cost Estimate

Category	LoM Total Cost (AU$ million)	LoM Unit Cost (AU$/t-processed)	Distribution (%)
Mining	4,371	31.64	37%
Processing	3,522	25.49	29%
G&A	611	4.42	5%
Water Treatment	244	1.76	2%
Market Development	18	0.13	0%
Concentrate Shipping	1,149	8.32	10%
Other Transport and Shipping Costs	641	4.64	5%
Government Royalty	1,392	10.08	12%
Total	**11,948**	**86.48**	**100%**

Source: SRK, 2020

The LoM total operating cost is AU$86.48 per t processed. On a combined basis, mining and processing make up approximately 66% of total LoM total operating cost.

A discussion of the cost categories comprising the total operating cost estimate is presented below.

18.2.1 Mine Operating

The LoM mine operating costs are summarized in Table 18-5.

Table 18-5: Mine Operating Costs

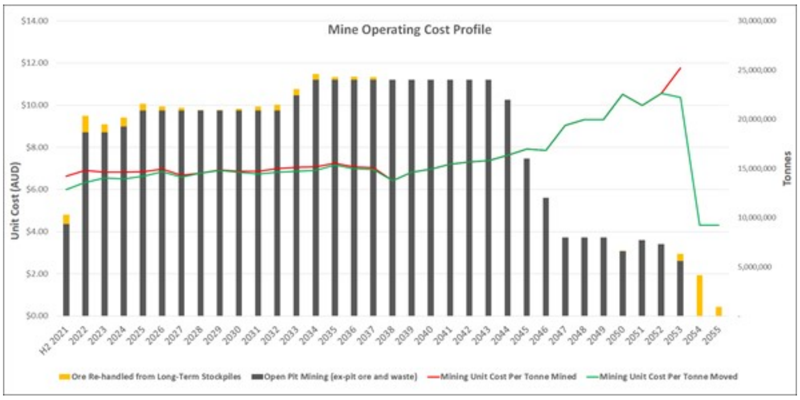
Category	LoM Total Cost (AU$ million)	LoM Unit Cost (AU$/t-mined)
Mining Overheads	605	1.01
Drill and Blast	923	1.55
Load and Haul	2,509	4.20
RoM Loader	243	0.41
Stockpile Rehandle	34	0.06
Grade Control Assays	12	0.02
Rockbreaking	46	0.08
Total	**4,371**	**7.32**

Source: SRK, 2020

The operating cost estimate is based on recent actual costs and the load and haul rates specified in the existing mining contract between Talison and SG Mining Pty Ltd (SGM), which include appropriate adjustments for rise and fall. Load and haul costs are variable depending on the pit bench from which the material is mined and whether the destination is the RoM pad, a long-term stockpile, or a waste dump.

The LoM unit operating cost is AU$7.32 per t mined from the open pit (AU$20.49 per bcm mined). On a total material movement basis (which includes tonnes of ore re-handled from long-term stockpiles), the LoM unit cost is AU$7.15 per t moved.

The mine operating cost profile over the life of the operation is shown in Figure 18-1.



Source: SRK, 2021

Figure 18-1: Mine Operating Cost Profile

Mine operating costs remain in a relatively constant range until the final nine years of open pit mining (2045 to 2053) when the annual mining rate decreases, and the deepest benches of the open pit are mined. During the final two years of plant operation (2054 and 2055) the only mining costs are those associated with re-handling ore from long-term stockpiles.

18.2.2 Processing Operating Costs

The LoM processing costs are summarized in Table 18-6.

Table 18-6: Process Operating Costs

Category	LoM Total Cost (AU$ million)	LoM Unit Cost (AU$/t-processed)
Crushing		
Crushing Plant 1	392	6.40
Crushing Plant 2	453	5.56
Subtotal Crushing Plants	845	6.07
Technical Grade Plant		
Variable Costs	139	39.89
Chemical Grade Plant 1		
Variable Costs	965	16.73
Chemical Grade Plant 2		
Variable Costs	1,573	19.28
Total All Plants	3,522	24.67

Source: SRK, 2021

The average LoM crushing cost is AU$6.07/t crushed. The average LoM processing cost for the Technical Grade Plant is AU$39.89/t processed. For Chemical Grade Plant 1 and Chemical Grade Plant 2, the LoM average processing costs are AU$16.73/t-processed and AU$19.28/t-processed, respectively. The average LoM combined crushing and processing cost is AU$24.67/t processed. The estimate of processing costs is based on Talison's recent actual costs. The processing costs exclude the crusher feed loader and the mobile rockbreaker.

18.2.3 Other Operating Costs

Other operating costs consist of general and administrative costs (G&A), water treatment and marketing development as shown Table 18-7.

Table 18-7: Other Operating Costs

Category	LoM Total Cost (AU$ million)	LoM Unit Cost (AU$/t-processed)
G&A		
Environmental	152	1.07
Health, Safety and Training	123	0.86
Administration	335	2.35
Subtotal G&A	611	4.28
Water Treatment	244	1.71
Market Development	18	0.13
Total Other Operating Costs	873	6.11

Source: SRK,2020

The other operating costs (G&A, water treatment and market development) are generally fixed over the life of the project and average approximately AU$24.6 million per year. The estimate of other operating costs is based on Talison's recent actual costs.

18.2.4 Shipping and Transportation Costs

Shipping and other transportation cost are shown Table 18-8.

Table 18-8: Shipping and Transportation Costs

Category	LoM Total Cost (AU$ million)	LoM Unit Cost (AU$/t-processed)
Shipping	1,149	8.05
Other Transportation Costs(1)	641	4.49
Total Other Operating Costs	1,790	12.54

(1)Includes freight, insurance, loading and storage.
Source: SRK, 2021

Costs for shipping and transportation are estimated based on Talison's recent actual costs and rates from current contracts.

18.2.5 Royalties

LoM royalty payments are estimated at AU$1,392M based on application of a 5% government royalty. The royalty is applicable to estimated LoM gross revenue from concentrate sales after deducting shipping costs to China.

19 Economic Analysis

19.1 General Description

SRK prepared a cash flow model to evaluate Greenbushes' ore reserves on a real basis. This model was prepared on an annual basis from the reserve effective date to the exhaustion of the reserves. This section presents the main assumptions used in the cash flow model and the resulting indicative economics. The model results are presented in U.S. dollars (US$ or US$), unless otherwise stated.

All results are presented in this section on a 49% basis reflective of Albemarle's ownership unless otherwise noted. Technical and cost information is presented on a 100% basis to assist the reader in developing a clear view of the fundamentals of the operation.

As with the capital and operating cost forecasts, the economic analysis is inherently a forward-looking exercise. These estimates rely upon a range of assumptions and forecasts that are subject to change depending upon macroeconomic conditions, operating strategy and new data collected through future operations.

19.1.1 Basic Model Parameters

Key criteria used in the analysis are presented throughout this section. Basic model parameters are summarized in Table 19-1.

Table 19-1: Basic Model Parameters

Description	Value
TEM Time Zero Start Date	July 1, 2021
Mine Life (first year is a partial year)	35
Discount Rate	8%

Source: SRK, Albemarle

All costs incurred prior to the model start date are considered sunk costs. The potential impact of these costs on the economics of the operation is not evaluated. This includes contributions to depreciation and working capital as these items are assumed to have a zero balance at model start.

The model continues one year beyond the mine life to incorporate closure costs in the cashflow analysis.

The selected discount rate is 8% as directed by Albemarle.

19.1.2 External Factors

Exchange Rates

As the operation is located in Australia, the operating and capital costs are modeled in AU$ and converted to US$ within the model. The foreign exchange rate profile for the model was provided by Albemarle and is presented in Table 19-2.

Table 19-2: Modeled Exchange Rate Profile

Calendar Year		2021	2022	2023	2024	2025+
FX Rate	US$:AU$	1.34	1.32	1.29	1.32	1.39

Source: Albemarle

Pricing

Modeled prices are based on the prices developed in the Market Study section of this report. The prices are modeled as US$650/t concentrate over the life of the operation. This price is a CIF price and shipping costs are applied separately within the model.

All concentrate streams produced by the operation are modeled as being subject to the price presented above.

Taxes and Royalties

As modeled, the operation is subject to a 30% income tax. All expended capital is subject to depreciation over a 20 year period. Depreciation occurs via a reducing balance method with a 2x multiplier. No existing depreciation pools are accounted for in the model.

As the operation is located within Western Australia, the operation is subject to a royalty of 5%. The amount of revenue subject to the royalty is the project's gross revenue less deductions for shipping costs.

SRK notes that the project is being evaluated as a standalone entity for this exercise (without a corporate structure). As such, tax and royalty calculations presented here may differ significantly from actuals incurred by Albemarle.

Working Capital

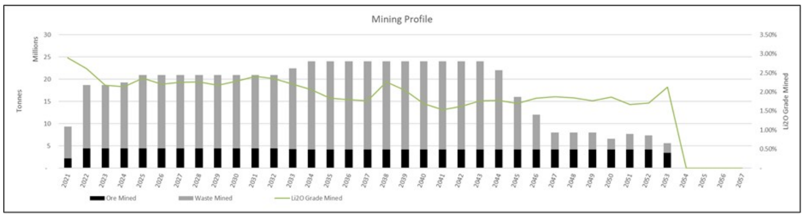
The assumptions used for working capital in this analysis are as follows:

- Accounts Receivable (A/R): 30 day delay
- Accounts Payable (A/P): 30 day delay
- Zero opening balance for A/R and A/P

19.1.3 Technical Factors

Mining Profile

The modeled mining profile was developed by SRK. The details of mining profile are presented previously in this report. No modifications were made to the profile for use in the economic model. The modeled profile is presented on a 100% basis in Figure 19-1.



Source: SRK

Figure 19-1: Greenbushes Mining Profile

A summary of the modeled life of mine mining profile is presented in Table 19-3.

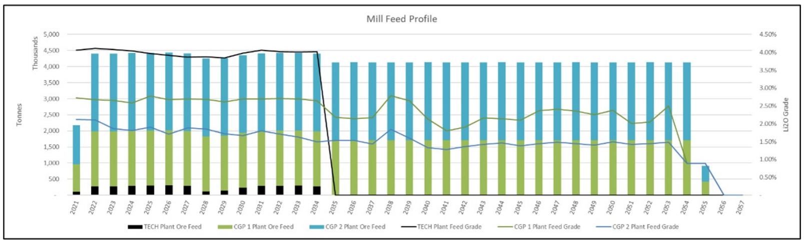
Table 19-3: Greenbushes Mining Summary

LOM Mining	Units	Value
Total Ore Mined Total Waste Mined	Mtonnes Mtonnes	138.1 458.7
Total Material Mined	Mtonnes	596.8
Average Mined Li2O Grade	%	2.02%
Contained Li2O Metal Mined	Mtonnes	2.8
LoM Strip Ratio	Num#	3.32x

Source: SRK

<u>Processing Profile</u>

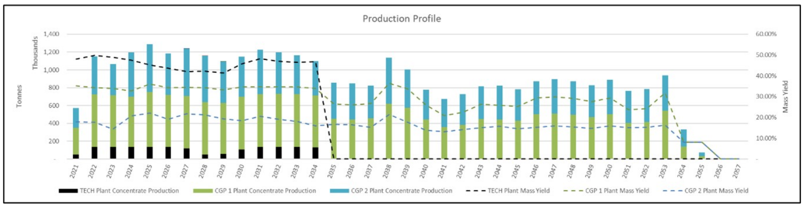
The processing profile was developed by SRK and results from the application of stockpile logic to the mining profile external to the economic model. No modifications were made to the profile for use in the economic model. The modeled profile is presented on a 100% basis in Figure 19-2.



Source: SRK

Figure 19-2: Greenbushes Processing Profile

The production profile was developed by SRK and results from the application of processing logic to the processing profile external to the economic model. No modifications were made to the profile for use in the economic model. The modeled profile is presented on a 100% basis in Figure 19-3.



Source: SRK

Figure 19-3: Greenbushes Production Profile

A summary of the modeled life of mine processing profile is presented in Table 19-4.

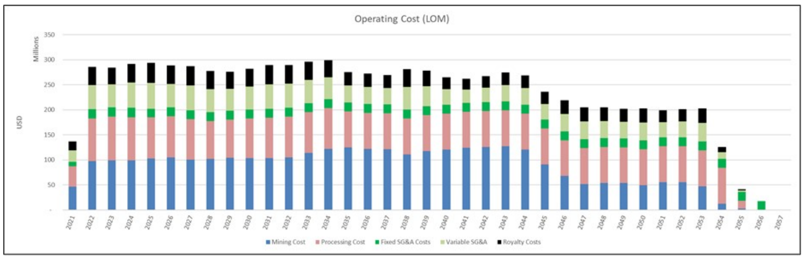
Table 19-4: Greenbushes Processing Summary

LOM Processing	Units	Value
TECH Plant		
Plant Feed (LoM)	Mtonnes	3.5
Average Annual Feed Rate	ktpy	249
Average Feed Grade (Li2O)	%	3.99%
Average Mass Yield	%	46.18%
CGP 1 Plant		
Plant Feed (LoM)	Mtonnes	5717
Average Annual Feed Rate	ktpy	1,649
Average Feed Grade (Li2O)	%	2.36%
Average Mass Yield	%	29.49%
CGP 2 Plant		
Plant Feed (LoM)	Mtonnes	816
Average Annual Feed Rate	ktpy	2,330
Average Feed Grade (Li2O)	%	1.58%
Average Mass Yield	%	16.77%

Source: SRK

Operating Costs

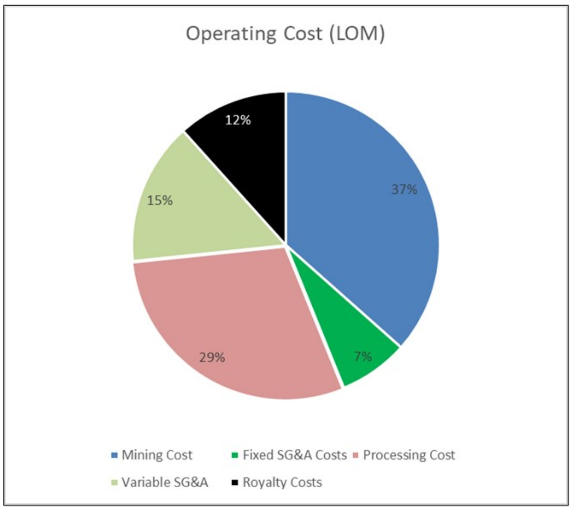
Operating costs modeled in Australian dollars and can be categorized as mining, processing and SG&A costs. No contingency amounts have been added to the operating costs within the model. All cost information in this section is presented on a 100% basis. A summary of the operating costs over the life of the operation is presented in Figure 19-4.



Source: SRK

Figure 19-4: Life of Mine Operating Cost Summary

The contributions of the different operating cost segments over the life of the operation are presented in Figure 19-5.



Source: SRK

Figure 19-5: Life-of-Mine Operating Cost Contributions

Mining

The mining cost profile was developed external to the model and was imported into the model as a fixed cost on an annual basis in Australian dollars. Within the model, the cost was converted to US$ using the exchange rate profile. The result of this approach is presented in Table 19-5 below on a 100% basis.

Table 19-5: Greenbushes Mining Cost Summary

LoM Mining Costs	Unit	Value
Mining Costs	US$M	3,163
Mining Cost	US$/t mined	5.03

Source: SRK

Processing

Processing costs were incorporated into the model as variable costs. Variable costs are applied to the tonnage processed each processing plant. Table 19-6 presents the variable cost on a per tonne basis for each plant. The CR 1 crushing facility process ore for both the TECH plant and the CGP 1 plant.

Table 19-6: Variable Processing Costs

Processing Area	Unit	Value
Crushing (CR 1)	AU$/t	6.40
Crushing (CR 2)	AU$/t	5.56
TECH Plant	AU$/t	39.89
CGP 1	AU$/t	16.73
CGP 2	AU$/t	19.28

Source: SRK

The result of this approach is presented in Table 19-7 on a 100% basis.

Table 19-7: Greenbushes Processing Cost Summary

LOM Processing Costs	Unit	Value
Processing Costs	US$M	2,550
Processing Cost	US$/t processed	17.86

Source: SRK

SG&A

SG&A costs were incorporated into the model as annual fixed and variable costs. The fixed cost component is presented in Table 19-8.

Table 19-8: SG&A Fixed Costs

Item	Unit	Value				
		Op Yr 1 (Partial)	Op Yr 2	Op Yr 3	Op Yr 4	Op Yr 5+
G&A	AU$M	8.6	17.2	17.2	17.2	17.2
Water Treatment	AU$M	2.8	6.6	6.7	7.1	6.9
Market Development	AU$M	0.3	0.5	0.5	0.5	0.5

Source: SRK

Variable SG&A costs consist of the transport and shipping costs associated with moving the operation's product to the selling point. These costs are presented in Table 19-9.

Table 19-9: SG&A Variable Costs

Item	Unit	Value
Shipping	AU$/t concentrate	35.57
Other Transport and Shipping Costs	AU$/t concentrate	19.85

Source: SRK

The result of this approach is presented in Table 19-10 on a 100% basis.

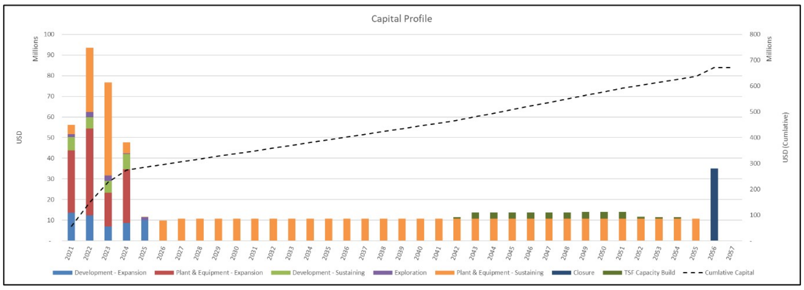
Table 19-10: Greenbushes SG&A Cost Summary

LoM SG&A Costs	Unit	Value
SG&A Costs	US$M	1,928
SG&A Cost	US$/t concentrate	59.71

Source: SRK

Capital Costs

As the operation is an existing mine, no initial capital has been modeled. Sustaining capital is modeled on an annual basis and is used in the model as developed in previous sections. No contingency amounts have been added to the sustaining capital within the model. Closure costs are modeled as sustaining capital and are captured as a one-time payment the year following cessation of operations. The modeled sustaining capital profile is presented in Figure 19-6.



Source: SRK

Figure 19-6: Greenbushes Sustaining Capital Profile

19.2 Results

The economic analysis metrics are prepared on annual after-tax basis in US$. The results of the analysis are presented in Table 19-11. The results indicate that, at a concentrate price of US$650/t CIF China, the operation returns an after-tax NPV@8% of US$3.2B (US$1.6B attributable to Albemarle). Note, that because the mine is in operation and is valued on a total project basis with prior costs treated as sunk, IRR and payback period analysis are not relevant metrics. Information in this section is presented on a 49% basis (portion of the project attributable to Albemarle).

Table 19-11: Indicative Economic Results (Albemarle)

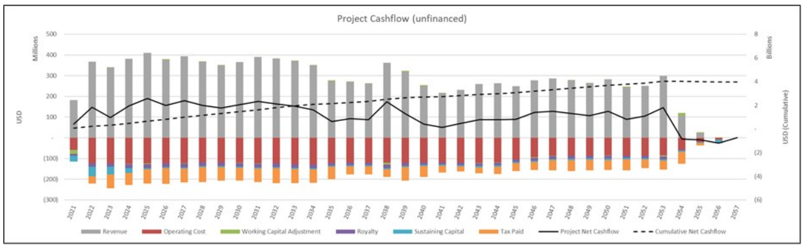
LoM Cash Flow (Unfinanced)	Units	Value
Total Revenue	US$M	10,287
Total Opex	US$M	(3,744)
Operating Margin	US$M	6,542
Operating Margin Ratio	%	64%
Taxes Paid	US$M	(1,743)
Free Cashflow	US$M	3,977
Before Tax		
Free Cash Flow	US$M	5,720
NPV @ 8%	US$M	2,198
After Tax		
Free Cash Flow	US$M	3,977
NPV @ 8%	US$M	1,562

Source: SRK

The economic results are presented on an annual basis in Table 19-12 and Figure 19-7.

Table 19-12: Greenbushes Annual Cashflow

Source: SRK



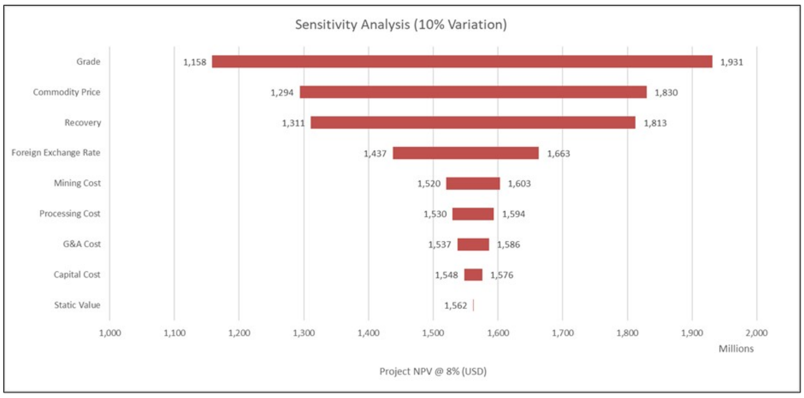
Source: SRK

Figure 19-7: Annual Cashflow Summary

19.3 Sensitivity Analysis

SRK performed a sensitivity analysis to determine the relative sensitivity of the operation's NPV to a number of key parameters. This is accomplished by flexing each parameter upwards and downwards by 10%. Within the constraints of this analysis, the operation appears to be most sensitive to, mined lithium grades, commodity prices and recovery or mass yield assumptions within the processing plant.

SRK cautions that this sensitivity analysis is for information only and notes that these parameters were flexed in isolation within the model and are assumed to be uncorrelated with one another which may not be reflective of reality. Additionally, the amount of flex in the selected parameters may violate physical or environmental constraints present at the operation.



Source: SRK

Figure 19-8: Greenbushes NPV Sensitivity Analysis

20 Adjacent Properties

SRK notes that no adjacent properties are relevant or material to the study or understanding of the Greenbushes property. Other exploration areas exist on the same property discussed herein, and there is potential for disclosure of additional materials from these areas as they are developed. Of note is the Kapanga area, contained on the same mineral tenements as the Greenbushes Lithium Operations, which has been the subject of recent exploration drilling in 2019-2021. As of the effective date of this report, the data collection and technical work for supporting a mineral resource and reserve statement for Kapanga has not been completed.

21 Other Relevant Data and Information

SRK includes the following information as it involves future expansion options at the Greenbushes site and the reader should be aware that they could have an impact on the overall production, economics, and roll on impact of permitting.

21.1.1 Technical Grade Plant (TGP)

The TGP plant operation is discussed in detail in Section 14.1. The TGP has operated historically for many years. The material feeding the plant is identified in the geologic model, then detailed grade control drilling is conducted in the pit. The results of the grade control assays are then used by Talison to assign which material is processed through the TGP. Feed to TGP is defined primarily by Li_2O grade and the iron grade that will achieve the final product iron quality specification for SC7.2. The iron grade for the plant feed is governed by mineralogy and is modelled using oxides of manganese, calcium, potassium, sodium and lithium in plant feed.

21.1.2 Tailings Retreatment Plant (TRP)

Greenbushes has developed and installed a Tailings Reprocessing Plant (TRP) to reprocess tailings at a rate of 2 Mt per year from Tailings Storage Facility 1 (TSF1). The TRP is planned to process approximately 10 Mt of tailings. The TRP processing facilities will be an oxide flotation plant capable of processing 2.0 Mtpa of reclaimed tailings, nominally grading 1.4% Li_2O at a design feed rate of 250 tph, to produce 285 ktpa of Spodumene concentrate grading 6.0% Li_2O. Feed to the TRP will be from a dedicated mining fleet operated by a Mining Contractor with experience in tailings reclamation. Feed will be directly loaded into the plant by a fleet of mining trucks or stored on a RoM stockpile adjacent to the feed bin. Mining will be conducted on a day shift only basis, with the processing plant fed by front end loader from the RoM during night shift. The TRP is located adjacent to and west of the planned TSF4. Operation of the facility has not been formally scheduled to date due to market demand.

21.1.3 Chemical Grade Plants (CGP3/CGP4)

Greenbushes has developed cost estimates and designs for the expansion of chemical grade spodumene production. These expansion plans are in the form of CGP3 and CGP4. The CGP3 and CGP4 facilities will each include a single crusher plant (4.8 Mtpa) that will feed both plants and will each process 2.4 Mtpa of 1.7% Li_2O at a nominal rate of 300t/h to produce 475,974tpa of SC6.0 concentrate grading 6% Li_2O. The process, design, and layout of CGP3 and CGP4 is the same as CGP2. The crusher system will be located near and just south of CGP2. The CGP3/CGP4 location is on the west side of Maranup Ford Road.

22 Interpretation and Conclusions

22.1 Geology and Resources

Geology and mineralization are well understood through decades of active mining, and SRK has used relevant available data sources to integrate into the modeling effort at the scale of a long term resource for public reporting. Additional data likely exists which could potentially be used to drive very small scale interpretation but would make very little impact on overall mineral resources.

Mineral resources have been estimated by SRK Consulting (U.S.) Inc. SRK generated a 3D geological model informed by various data types (primarily drilling and pit mapping) to constrain and control the shapes of the pegmatite bodies which host the Li_2O. Drilling data from the exploration data set was composited within relevant geological wireframes, and Li_2O grades were interpolated into a block model using ordinary kriging methods. Results were validated visually, via various statistical comparisons, and against recent reconciliation data. The estimate was depleted for current production, categorized in a manner consistent with industry standards, and reviewed with Talison site personnel. Mineral resources have been reported using an optimized pit shape, based on economic and mining assumptions to support the reasonable potential for eventual economic extraction of the resource. A cut-off grade has been derived from these economic parameters, and the resource has been reported above this cut-off.

In SRK's is of the opinion, that the mineral resources stated herein are appropriate for public disclosure and meet the definitions of Indicated and Inferred resources established by SEC guidelines and industry standards.

22.2 Reserves and Mining Methods

22.2.1 Reserves and Mine Planning

SRK has reported mineral reserves that, in its opinion, are appropriate for public disclosure. The mine plan, which is based on the mineral reserves, spans approximately 32 years (or approximately 35 years when including the processing of low-grade stockpiles at the end of the mine life). Annual material movement requirements are reasonable, with a peak annual material movement of approximately 24 Mt. Over the life of the project, approximately 465 Mt of waste will be mined from the open pit. A feasible waste dump design exists to accommodate the LoM waste quantity; however, a portion of the footprint of the designed waste dump extends over the Kapanga lithium exploration target. SRK recommends that Greenbushes review its waste dump design to determine whether it will be possible to move the waste dump design to a location other than the area over the Kapanga target.

22.2.2 Geotechnical

The overall pit has been designed such that it meets the minimum acceptable stability criteria. Even under reduced strength conditions the slopes are predicted to remain stable. The 2021 pit has been adjusted to minimize the bullnose geometry between Cornwall and Central Lode pits to enhance stability. This is an area to watch for local stability issues, but it is not anticipated to present a major stability problem.

There remains uncertainty in hydrogeological conditions, particularly in regard to bench face stability due to local pore pressures and the need to dewatering benches.

The character and orientation of the interpreted geologic structures in the east wall of the Central Lode have a high degree of uncertainty. Given the conservative FOS of the east wall, this uncertainty is not expected to have significant impact of predicted stability unless geologic structures locally intersect such that unstable wedges are formed. Additional structural data should be collected to mitigate this potential ahead of any local instabilities.

The thickness and strength properties of the waste dump material at the crest of the west wall of the Central Lode are uncertain. Given the adequate stability analysis results this should not be a major issue unless the assumed properties are vastly different. This can be mitigated by conducting a geotechnical investigation of the waste dump nearest the pit crest.

Local bench-scale failures and rockfalls in the west wall of the Central Lode present a safety risk. Greenbushes is aware of this need which can be mitigated via the slope monitoring program and use of safety protocols when approaching the face, including annual/semiannual bench face scaling and real-time movement monitoring.

22.3 Mineral Processing and Metallurgical Testing

As part of the process design for CGP2, Greenbushes conducted an evaluation of the use of HPGR as an alternative to the ball mill grinding circuit currently used in CGP1.

Greenbushes used a combination of size distributions, Li_2O analysis of size fractions and liberation data to estimate the yield and lithium recovery. Greenbushes' HPGR yield model developed for CGP2 predicts about 5% higher overall lithium recovery than the CGP1 yield model.

CGP2 plant commissioning has not been completed and the lithium recovery benefit associated with HPGR comminution has not yet been demonstrated.

22.4 Processing and Recovery Methods

Greenbushes currently has two chemical grade processing plants (CGP1 and CGP2). Commissioning of CGP2 was initiated during September 2019 and continued through April 2020 when it was shut down and placed on care and maintenance due to market considerations. The process flowsheets utilized by both CGP1 and CGP2 are similar, however, CGP2 was designed with a number of modifications based on HPGR comminution studies and CGP1 operational experience. The most notable modification included the replacement of the ball mill grinding circuit with HPGRs.

Greenbushes has developed mass yield models for both CGP1 and CGP2 which are used to predict concentrate mass yield %, based on ore grade, into concentrates containing 6% Li_2O. A comparison of the CGP1 yield model with actual CGP1 plant performance shows that the CGP1 yield model is generally a good predictor of CGP1 plant performance.

However, a comparison of the CGP2 yield model with actual CGP2 plant performance during commissioning shows that CGP2 has significantly underperformed the CGP2 yield model. Greenbushes metallurgical staff have developed a new yield equation for CGP2 based on actual performance during the period 2019 to 2021. For purposes of financial modeling SRK has assumed that this updated yield equation will represent CGP2 production during the period 2023 to 2024 while Greenbushes works to resolve process issues related to CGP2.

SRK notes that that CGP2 and CGP1 flowsheets for are similar and both plants process ore from the same mining operation, as such, SRK believes that it is reasonable to expect that CGP2 will eventually achieve design product targets but cautions that at this point design performance of CGP2 remains to be demonstrated and has not yet been confirmed.

22.5 Infrastructure

The infrastructure at Greenbushes is installed and functional. Expansion projects have been identified and are at the appropriate level of design depending on their expected timing of the future expansion. Tailings and waste rock are flagged as risks due to the potential for future expansion and location of future resources that are in development. A detailed review of long-term storage options for both tailings and waste rock will allow timely planning and identification of alternative storage options for future accelerated expansion if needed.

22.6 Environmental/Social

The Project has been in operation as a hard rock mine since 1983 and is fully permitted for its current operations. The Project is in the process of obtaining further approvals for expansion; however, consideration of the expansion has been excluded from this evaluation as detailed assessment information is not yet available.

During development and subsequent modifications to the mine, environmental studies and impact assessments have been completed to support project approval applications. Many of these studies are currently being updated as part of the current expansion efforts; as such, the most up-to-date information was not readily available. Some of the key findings from previous studies include:

- No Threatened Ecological Communities, Priority Ecological Communities or threatened flora have been reported in the vicinity of the mine site
- There have been seven conservation significant fauna species recorded in the mine development area
- Surface water drains through tributaries of the Blackwood River which is registered as a significant Aboriginal site that must be protected under the Aboriginal Heritage Act 1972
- Groundwater is not a resource in the local area due to the low permeability of the basement rock
- Earlier studies indicated that the pits would overflow approximately 300 years after mine closure; however, more recent modelling suggests that water levels will stabilize in approximately 500 to 900 years and remain 20 m below the pit rims (i.e., no overflow)
- Background groundwater quality data are limited due to a lack of monitoring wells upgradient of the mine, and as monitoring wells are located close to the TSFs and/or in the historically dredged channels; some of these wells have been impacted by seepage, and is under investigation and remediation efforts
- Waste rock is not typically acid generating, though some potentially acid generating (PAG) granofels (metasediments) do occur in the footwall of the orebody. Significant acid neutralizing capacity (ANC) has been shown to exist in waste rock and pit walls

- Studies into the potential for radionuclides has consistently returned results that are below trigger values
- There are no other cultural sites listed within the mining development area

The Project operates under approvals that contain conditions for environmental management that include waste and tailings disposal, site monitoring, and water management. The Project has not incurred any significant environmental incidents (EPA, 2020).

There has been no predictive modeling of the pit lake quality as far as SRK is aware, and this is recommended to inform closure management strategies. There is potential for site water management to be required post-closure until seepage from TSF2 attenuates.

The Project has contaminated five sites listed which encompass the entire mine area due to known or suspected contaminated sites due to hydrocarbons and metals in soil, and elevated concentrations of metals in groundwater and surface water. These sites are classified as “Contaminated – Restricted use” and only permit commercial and industrial uses. This will need to be reviewed for final land use options for closure.

Talison has agreements in place with two local groups.

22.7 Closure

Although Greenbushes has a closure plan prepared in accordance with applicable regulations, this plan should be updated to include all closure activities necessary to properly closure all of the project facilities that are part of the current mine plan including future expansions and facilities. This update should be prepared in accordance with applicable regulatory requirements and commitments included in the approved closure plan. It should also be prepared in sufficient detail that a proper PFS-level closure cost estimate can be prepared.

SRK cannot validate the current closure cost estimate because there is no information on how the unit rates used in the model were derived. Furthermore, because the model uses standard rates rather than site specific ones, and Greenbushes only overrode those rates for a few items, such as revegetation.

22.8 Costs

The Greenbushes cost forecasts are based on mature mine budgets that have historical accounting data to support the cost basis and forward looking mine plans as a basis for future operating costs as well as forward looking capital estimates based on engineered estimates for expansion capital and historically driven sustaining capital costs. In SRK’s opinion, the estimates are reasonable in the context of the current reserve and mine plan.

22.9 Economics

The Greenbushes operation consists of an open pit mine and several processing facilities fed primarily by the open pit mine. The operation is expected to have a 35 year life with the first modeled year of operation being a partial year to align with the effective date of the reserves. Under the forward-looking assumptions modeled and documented in this report, the operation is forecast to generate positive cashflow.

As modeled for this analysis, the operation is forecast to produce 32.3 Mt of concentrate to be sold at a spodumene price of US$650/t CIF China. This results in a forecast after-tax project NPV@8% of US$3.2B, of which, US$1.6B is attributable to Albemarle.

The analysis performed for this report indicates that the operation's NPV is most sensitive to variations in the grade of ore mined, the commodity price received and processing plant performance.

23 Recommendations

23.1 Recommended Work Programs

23.1.1 Geology and Mineral Resources

SRK recommends development of a detailed structural model to provide further support to geologic modeling of the deposit.

23.1.2 Geotechnical Program

Recommendations for future geotechnical work includes the following:

- Field mapping to ground truth interpreted geologic structures and update structural model
- Conduct numerical modelling of the east wall to check for interaction with the proposed Kapanga pit
- Assess stability of each short-term pit stage for opportunities to steepen interim wall angles
- Review any additional geotechnical data from drilling in the Pegmatite Shear Zone (PSZ) to reduce uncertainties in effective rock mass properties
- Update the hydrogeological conceptual model considering VWP data and asses the benefits of dewatering on bench stability
- Conduct rock fall trials and perform a rock fall risk assessment towards developing rockfall hazard maps with focus on ramp and active pit safety

23.9.3 Environmental and Closure

There has been no predictive modeling of the pit lake quality as far as SRK is aware, and this is recommended to inform closure management strategies. There is potential for site water management to be required post-closure until seepage from TSF2 attenuates. The closure cost estimate should be updated to reflect current industry best practice.

23.2 Recommended Work Program Costs

Table 23-1 summarizes the costs for recommended work programs.

Table 23-1: Summary of Costs for Recommended Work

Discipline	Program Description	Cost (US$)
Geology and Mineralization	Detailed structural model development	50,000
Mineral Resource Estimates	Revise mineral resource estimates using detailed structural model, incorporate higher levels of detail for geological modeling supporting short range planning.	100,000
Mineral Reserves and Mining	Review the waste dump design to determine whether it will be possible to move the waste dump to a location other than the area over the Kapanga deposit.	100,000
Geotechnical	Structural mapping, hydrogeological model update, pit phase stability assessments, rock fall assessment	90,000
Process	Conduct ongoing performance assessment on CGP2 to determine modifications/adjustments to the flow sheet to improve the performance to design levels. (estimated at (1.32US$:AU$))	56,820,000
Infrastructure	Life of Mine Tailings Disposal study, Studies required for further characterization of TSF1 and advancement of the expansion design, Comprehensive 3rd party dam safety review.	2,500,000
Environmental Studies, Permitting, and Plans, Negotiations, or Agreements with Local Individuals or Groups	Conduct comprehensive geochemical predictive modeling of the post-closure pit lakes, as this could have significant bearing on possible long-term water treatment requirements. A site-wide assessment of water quality should be completed including diffuse and point sources, and predictions of long-term water quality. This would inform closure planning and determine if long-term, post-closure water management or treatment is required.	375,000
Closure Costs	The closure cost estimate should be updated to reflect current industry best practice. The update should use standard calculating methods, site specific data, and include all costs that could be reasonably incurred. It is possible that the closure plan may require additional such as predicting the need for long term water treatment.	75,000
Total US$		**$60,110,000**

Source: SRK, 2020

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25 Reliance on Information Provided by the Registrant

The Consultant’s opinion contained herein is based on information provided to the Consultants by Albemarle throughout the course of the investigations. Table 25 1 of this section of the Technical Report Summary will:

(i) Identify the categories of information provided by the registrant;

(ii) Identify the particular portions of the Technical Report Summary that were prepared in reliance on information provided by the registrant pursuant to Subpart 1302 (f)(1), and the extent of that reliance; and

(iii) Disclose why the qualified person considers it reasonable to rely upon the registrant for any of the information specified in Subpart 1302 (f)(1).

Table 25-1: Reliance on Information Provided by the Registrant

Category	Report Item/ Portion	Portion of Technical Report Summary	Disclose why the Qualified Person considers it reasonable to rely upon the registrant
Discount Rates	19	19 Economic Analysis	Albemarle provided discount rates based on the company’s Weighted Average Cost of Capital (WACC). While this discount rate is higher than what SRK typically applied to mining projects (ranging from 5% to 12% dependent upon commodity), SRK ultimately views the higher discount rate as a more conservative approach to project valuation.
Foreign Exchange Rates	19	19 Economic Analysis	SRK was provided with exchange rates from a well-recognized financial firm. These rates are broadly in-line with the current spot exchange rates. As such, it is SRK’s opinion that the rates provided are appropriate.
Tax rates and government royalties	19	19 Economic Analysis	SRK was provided with tax rates and government royalties for application within the model. These rates are in line with SRK’s understanding of the tax regime at the project location.
Environmental Studies	17	17.1 Environmental Studies	SRK was provided various environmental studies conducted on site. These studies were of a vintage that independent validation could not be completed.
Environmental Compliance	17	17.3.4 Environmental Compliance	Registrant provided regulatory compliance audit results. SRK did not conduct an independent regulatory compliance audit as part of the scope.
Local Agreements	17	17.4 Local Individuals and Groups	Registrant provided agreements with local stakeholders. SRK was unable to query all project stakeholders on issue of agreements.

Signature Page

This report titled “SEC Technical Report Summary, Pre-Feasibility Study, Greenbushes Mine, Western Australia” with an effective date of June 30, 2021, was prepared and signed by:

SRK Consulting (U.S.) Inc. **(Signed) SRK Consulting (U.S.) Inc.**

Dated at Denver, Colorado
January 28, 2022