

ASX / MEDIA

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ANNOUNCEMENT

# DECEMBER 2021 QUARTERLY ACTIVITIES REPORT

Surging lithium prices drive record quarterly operating cashflow despite impact on production from commissioning, ramp-up delays and labour shortages

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## KEY POINTS

### Production and sales

- Production of 83,476 dry metric tonnes (**dmt**) of spodumene concentrate (September Quarter: 85,759 dmt).
- Spodumene concentrate shipments of 78,679dmt (September Quarter: 91,549 dmt).
- Average prices received in the December Quarter were in the range of approximately US\$1,750/dmt to US\$1,800/dmt (calculated on a CIF China SC 6.0 basis), at the top end of prior guidance (being USD\$1,650-\$1,800/dmt CIF China SC6.0 basis).
- Tantalite concentrate sales totalled 29,038lbs (September Quarter: 36,876lbs).
- Production was slightly lower than the revised guidance of 85-95kt due to reduced mine movements, delays with commissioning of plant improvement works, plant ramp-up initiatives and extended plant shutdowns (both planned and un-planned) and exacerbated by the impact of current industry-wide labour shortages (refer ASX Release dated 21 December 2021).

### Lithium market

- Further strengthening in lithium market conditions experienced during the Quarter, with strong demand and constrained supply leading to record product pricing, which has continued to trend materially higher since late last year.
- Exceptional results from Pilbara Minerals' third digital auction of spodumene concentrate on the Battery Material Exchange (BMX), with a sales price of US\$2,350/dmt (SC5.5, FOB Port Hedland basis) achieved in October 2021.
- Price review discussions completed during the Quarter with existing offtake customers to better align pricing with prevailing market conditions, resulting in a significant upward revision in spodumene concentrate pricing received.
- Indicative pricing for the March 2022 Quarter under existing offtake contracts expected to be in the range of US\$2,600-3,000/dmt CIF China (SC6.0 basis).

## Project developments

- Staged restart of production from the Ngungaju Plant continued:
  - Coarse concentrate commissioning commenced during the Quarter, with production expected to increase following optimisation of the coarse circuit through the re-commissioning phase;
  - Commencement of commissioning of the fines flotation circuit targeted for the latter part of the March Quarter of 2022; and
  - Total annualised spodumene production capacity from Ngungaju of ~180-200,000 dry metric tonnes (dmt) expected from the September Quarter following completion of the commissioning and ramp-up phase.
- Pilgan Plant Improvements Project:
  - All construction elements substantially completed during the December Quarter.
  - Commissioning and ramp-up of the plant improvements commenced during the Quarter and are continuing.
- Scoping Study for the Mid-Stream Product Demonstration Plant in collaboration with Calix Limited nearing completion, with technical and engineering work now substantially complete.
- Power Purchase Agreement signed with Contract Power to construct and operate a 6MW PV solar array (refer to ASX release dated 20 October 2021).

## Pilgangoora Ore Reserve Upgrade

- Material increase in the Pilgangoora Ore Reserve to 162mt, an increase of 47% from the 2020 Pilgangoora Ore Reserve (refer to ASX release dated 6 October 2021).

## Corporate

- Record operating cashflow of \$115.5M delivers Quarter-end cash balance of \$245M, inclusive of \$53.8M of irrevocable bank letters of credit for shipments completed up to 31 December 2021 (September Quarter: \$137.3M).
- Formal DSJV agreements executed with POSCO to jointly develop a 43ktpa LHM chemical conversion facility in South Korea (refer ASX release dated 26 October 2021).
- Agreements executed with existing senior secured financiers to expand both the existing Syndicated Finance and Working Capital facilities.
- 2021 Annual Report (including 2021 Sustainability Report) and Corporate Governance Statement released with AGM held in November 2021.

## 1. Operations Overview

During the December Quarter 2021 (**the Quarter**), Pilbara Minerals Limited (**Pilbara Minerals or the Company**; ASX: PLS) continued to progress work programs to increase spodumene concentrate production at the Pilgangoora Project, responding to surging global demand for lithium raw materials.

Production for the Quarter was slightly lower than the revised guidance range of 85-95kt of spodumene concentrate announced on 21 December 2021, due to extended duration outages at both the Ngungaju and Pilgan plants in the latter part of December.

Overall, in the Quarter there were delays experienced with both the Ngungaju Plant re-start and Pilgan Plant Improvements Project, particularly through plant commissioning, ramp-up initiatives, and extended plant shut-downs (for both regular maintenance and to address equipment failures). Further, progress with overall mining activities hampered

access to the optimal ore blend to maximise product recovery. Pilbara Minerals' response has been to work constructively with its existing mining contractor to deploy additional resources to address these issues as well as deploy further resources to its own 'owner mining' capacity.

These delays and shortfalls were further impacted by the extended border closures, which are now exacerbating the ability of all mining companies in Western Australia to access key personnel in construction, production, and maintenance roles.

The key impacts being experienced by Pilbara Minerals relate principally to manning levels for increased contract mining, construction, and improvement projects, as well as delays in sourcing additional labour and equipment for plant shutdowns and repairs. These issues are being widely experienced across the entire Western Australian resources sector.

## 1.1 SUSTAINABILITY

### 1.1.1 Health and safety

Four recordable safety incidents were recorded in the December Quarter that included three minor lacerations and one electric shock incident. At the end of the December Quarter, the Total Recordable Incident Rate was 4.42.

The Company continued to closely monitor the COVID-19 situation and respond accordingly to any changes in directives by the state and federal governments. To date there has been no direct impact on the Company's operations in respect of onsite infection.

Pilbara Minerals worked closely with key industry bodies and government departments to ensure updated protocols and systems were in place to manage the health and safety of its workforce and contractors in anticipation of a scheduled re-opening of the Western Australia border. This included updated protocols and procedures to deal with the likely transmission of the new COVID-19 Omicron variant, based on the experience of states and territories on the eastern seaboard of Australia.

In the event of wider-spread community transmission of the virus in Western Australia, there will likely be impacts to most (if not all) mining operations in Western Australia. Pilbara Minerals remains focused on taking all steps to responsibly maintain operations, whilst ensuring the health and safety of its people and other key stakeholders.

### 1.1.2 Sustainability Report

Pilbara Minerals released its third Sustainability Report, which was included within the FY2021 Annual Report<sup>1</sup>. The report outlined how the Company has been sustainably managing the extraction and processing of the lithium raw materials produced, which are an essential element in the push to decarbonise the global economy. The report addressed Environmental, Social and Governance (ESG) performance in FY2021 and articulated the Company's ESG commitments for FY2022.

Highlights of the report included the Company's expanded disclosure of its sustainability performance. FY2021 performance was measured and presented against the Sustainability Accounting Standards Board framework for the mining and metals industry. In addition, the report presented Pilbara Minerals' climate strategy and high-level Net Zero pathway, as well as community investment initiatives that are bringing direct and indirect benefits to local communities.

<sup>1</sup> <http://www.pilbaraminerals.com.au/site/PDF/2a1d4b6e-e56f-4784-9206-2b59272d41df/2021AnnualReport>

### 1.1.3 Solar Farm

During the Quarter, Pilbara Minerals announced the signing of a power purchase agreement with Contract Power Australia to construct, operate and maintain a 6MW solar photovoltaic (PV) farm (See ASX release dated 20 October 2021). This power solution supports decarbonisation at the Pilgangoora Project by displacing 3.8 million litres of diesel fuel per annum, saving an estimated 9,900t of CO<sub>2</sub> pa over the contract period.

This is an important initiative that has been undertaken in collaboration with Australia's specialist clean energy investor, the Clean Energy Finance Corporation who are a lender under the Company's senior secured syndicated debt facility.

### 1.1.4 People and culture

Strong progress was made by the Company in its ongoing recruitment campaign to support its operational expansion, despite the extremely competitive labour market present in the resources sector. During the December Quarter, 86 positions were recruited to join Pilbara Mineral's workforce. The main focus of recruitment for Pilbara Minerals' employees has been personnel to support the Company's owner-mining fleet (supplementing overall mining capacity) and the additional operating and maintenance labour for the Ngungaju Plant.

As a result of this recruitment campaign, the Company's employee numbers increased by 27% in the December Quarter and 125% in the 2021 calendar year, with a total of 295 employees as at 31 December 2021.

While Pilbara Minerals was largely successful in the recruitment of full-time personnel in support of expanded operations, peak labour across contract workgroups including our mining contractor (MACA), construction, shutdown and breakdown maintenance groups proved more difficult in light of the COVID border restrictions. The Company continues to work with its key contractors to find innovative solutions to try to maintain appropriate manning levels that support ongoing operations.

## 1.2 Mining and processing commentary

Total material mined across the entire Pilgangoora Operation was 4,672,233 wet metric tonnes (**wmt**) (September Quarter: 3,568,836 wmt) across Central, South and Monster ore pits. Total ore mined for the Quarter across these three pits was 779,368 wmt at an average grade of 1.42% Li<sub>2</sub>O.

While total material movement increased through the inclusion of Pilbara Minerals owner-mining fleet (which commenced during the December Quarter), total waste and ore movements were below plan, meaning access to the optimal ore blend for plant feed was compromised. As additional MACA and Pilbara Minerals mining resources are deployed, it is expected that increased total material movements at a higher strip ratio will be mined over approximately the next 18 months. This will support additional access to ore (including the required optimal ore blend) to facilitate expanded production and higher concentrate recovery rates at both plants once they are fully ramped-up.

Processing rates during the December Quarter were impacted by delays for both the Ngungaju Plant re-start and Pilgan Plant Improvements Project, particularly through plant commissioning, ramp-up initiatives, and extended plant shut-downs (for both regular maintenance and unplanned shutdowns to address equipment failures).

These delays were further impacted by the extended border closures which have been impacting the ability of all mining companies in Western Australia to access key personnel in construction, production and maintenance roles. As a result, the Company revised its guidance for the December Quarter and for FY22.

The Pilgan Plant achieved an average runtime of 76% for the Quarter, below the targeted run-time of 84%, due to several unplanned equipment breakdowns and extended shutdowns that were necessary to tie-in new equipment as part of the Plant Improvements Project. The Ngungaju Plant is still within its ramp-up phase within the dense media separation (**DMS**) coarse circuit and therefore only recovering coarse concentrate from transitional ore feed.

Total processing plant feed of 566,027 dmt (September Quarter: 443,691 dmt), resulted in the production of 83,476 dmt of spodumene concentrate (September Quarter: 85,759 dmt) (refer Table 2) across the two processing plants.

Lithia recoveries for the entire Pilgangoora Operation were 62%, including for the first time the lower-recovery DMS tonnes from the Ngungaju facilities (prior to the commissioning and ramp-up of the fines flotation circuit). That said, Pilgan Plant recovery was lower than planned (65% versus targeted 75%) which was impacted by less than optimal ore feed to the plant during the Quarter (due to the previously mentioned mining constraints for ore feed blend), tie-in and ramp-up of the new Improvements Project equipment and several plant breakdown events which interrupted steady state production.

Quantities for mining, ore processed, shipments and concentrate stocks for the Quarter are shown below (Refer Table 1, Table 2 and Table 3).

**Table 1: Total ore mined and processed**

	Units	Q3 FY21	Q4 FY21	Q1 FY22	Q2 FY22
<b>Ore mined</b>	wmt	585,068	672,020	639,188	<b>779,368</b>
<b>Waste mined</b>	wmt	1,639,128	1,976,039	2,929,647	<b>3,892,865</b>
<b>Total material mined</b>	wmt	2,224,196	2,648,059	3,568,836	<b>4,672,233</b>
<b>Ore processed</b>	dmt	415,277	422,111	443,691	<b>566,027</b>

### 1.3 Shipments and sales

During the Quarter a total of 78,679 dmt of spodumene concentrate was shipped (both SC5.5 and SC6.0) under existing offtakes and to customers on a spot sale basis.

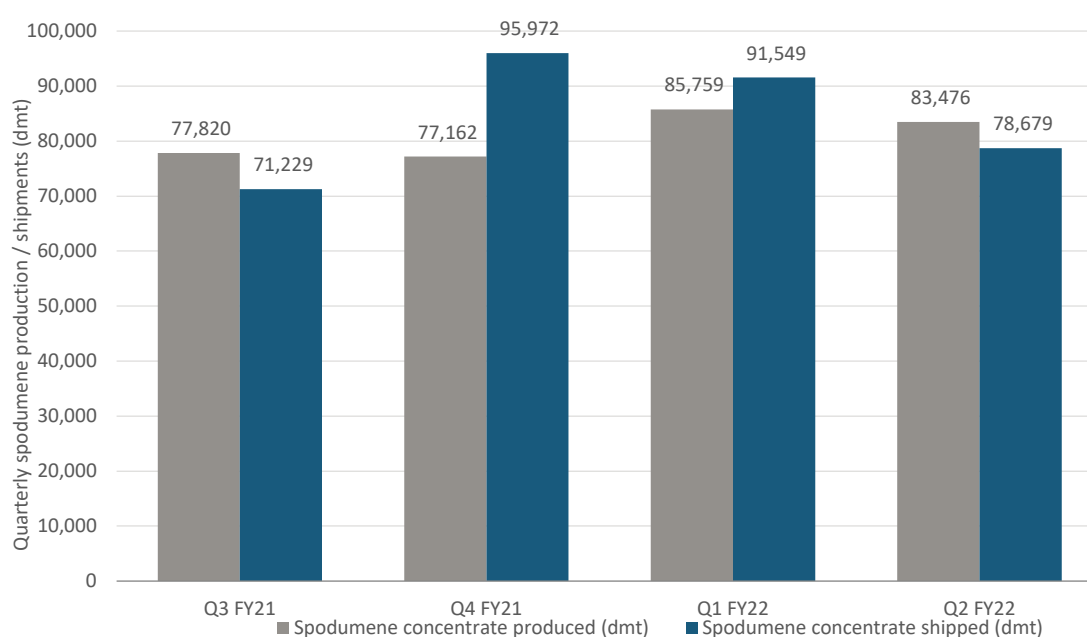


Figure 1. Quarterly spodumene concentrate production and shipments (dmt)

Pilbara Minerals also completed a price review with its offtake partners (as allowed for under its offtake agreements), in order to address the growing disconnect in the market between longer dated spodumene offtake pricing outcomes (which typically reference lithium chemical pricing inputs), compared to the emerging spodumene spot sales market.

This process was successfully completed during the Quarter and Pilbara Minerals appreciates the continued support of its long-term offtake customers.

Based on the outcome of these discussions and continued strengthening in the lithium chemicals market, the Company expects to achieve estimated spodumene concentrate pricing in the range of approximately US\$2,600-3,000/dmt CIF China (SC6.0 basis) during the March 2022 Quarter, subject to any provisional and final pricing adjustments for grade and final assay results.

The Company also intends to maximise its exposure to the new market dynamics via its BMX digital sales platform, which facilitates trade auctions for any product available outside existing longer dated offtake arrangements.

Tantalite concentrate sales for the Quarter were 29,038 lbs (including provisional sales, pending final reconciliation and assay results).

**Table 2: Production and shipments**

	Units	Q3 FY21	Q4 FY21	Q1 FY22	Q2 FY22
<b>Spodumene concentrate produced</b>	dmt	77,820	77,162	85,759	<b>83,476</b>
<b>Spodumene concentrate shipped</b>	dmt	71,229	95,972	91,549	<b>78,679</b>
<b>Tantalite concentrate produced</b>	lbs	36,481	34,048	33,557	<b>24,629</b>
<b>Tantalite concentrate shipped</b>	lbs	47,831	39,234	36,876	<b>29,038</b>

**Table 3: Stocks position**

	Units	Q3 FY21	Q4 FY21	Q1 FY22	Q2 FY22
<b>Spodumene concentrate stocks</b>	dmt	40,134	18,845	12,557	<b>16,496<sup>1</sup></b>
<b>Tantalite concentrate stocks</b>	lbs	24,775	19,588	16,269	<b>11,860</b>

<sup>1</sup>Closing balance includes reconciliation adjustments of -858 dmt during the Quarter for final survey adjustments, storage handling at the mine site, moisture reconciliation and draft survey at port.

## 1.4 Production Guidance

Due to production delays experienced during the December Quarter, FY22 annual concentrate production guidance was revised in December to 400-450,000 dmt (previously 460-510,000 dmt).

FY22 shipped tonnes guidance was also revised to 380-440,000 dmt for the period (previously 440-490,000 dmt).

Since then the Company has continued to experience delays with the ramp-up of both the Pilgan and Ngungaju plants. The production impacts in mining and processing (described above) are largely due to labour shortages across the industry, as a result of ongoing border lock downs to reduce the effects of COVID-19 distribution through the community. There is some risk there are further impacts to labour availability with ongoing community distribution of COVID-19 in Western Australia.



In light of this, a review of its guidance is currently underway and the Company expects to provide further information for both the March Quarter and FY22 annual guidance in parallel with the Company's half year results in the latter part of February.

## 2. Market Commentary

Prices for spodumene concentrate and lithium raw materials reached record highs in the December Quarter, fuelled by surging demand and concerns about supply shortages.

Price reporting agency, Benchmark Mineral Intelligence, reported on 31 December 2021 that the price for battery-grade lithium carbonate EXW China reached US\$41,925/tonne for the first time in the December Quarter, with their mid-point assessment settling at US\$39,250/tonne, up by 485.8% on prices a year ago. S&P Global Platts reported that seaborne lithium carbonate prices have gained 413% since the start of 2021 to US\$32,600/mt CIF North Asia on 14 December, while lithium hydroxide prices have climbed 254% over the same period to US\$31,900/mt CIF North Asia.

Since then, pricing has continued to rise strongly in the early part of 2022 amid strong demand and concerns over supply. S&P Global Market Intelligence forecasts a supply deficit of 5,000mt LCE in 2022 which compares with a surplus of 66,000mt in 2020 and an estimated deficit of 8,000mt in 2021, with the ongoing deficit expected to underpin continued strong pricing in 2022.

A key driver of current market conditions has been surging EV sales in Europe and the explosive growth of China's New Energy Vehicle (NEV) market. Data released by the China Association of Automobile Manufacturers (CAAM) shows that NEV sales are likely to reach 3.4 million units in 2021 and 5 million units in 2022. If realised, these sales will be 300% more than what the country sold in 2020. In addition, supply chain issues have contributed to pricing outcomes with Bloomberg noting that ongoing maintenance requirements at a series of lithium plants in China, anti-pollution curtailments associated with the Winter Olympics in China, the arrival of the COVID-19 Omicron variant in China and labour shortages stemming from COVID-19 related State border closures in Western Australia have contributed to supply shortages with lithium raw materials.

During the Quarter, Bloomberg NEF (BNEF) released its 2021 Battery Price Survey, noting that lithium-ion battery pack prices have fallen by 89% in real terms between 2010 and 2021, from above US\$1,200 per kilowatt-hour in 2010 to US\$132/kWh in 2021. Such cost reductions in the manufacture of battery packs bodes well for the future and are expected to support the continued adoption of electric vehicles, which rely on lithium-ion battery technology.

## 3. Project Development

### 3.1 Ngungaju Plant restart

Commissioning and first spodumene concentrate from the coarse circuit at the recently restarted Ngungaju Plant was achieved in mid-October (see ASX release dated 13 October 2021) as part of the staged restart of the operation.

Following re-commencement of the operation, the commissioning and ramp-up of the plant continued in parallel with necessary construction works and plant maintenance activities. Commissioning of the fines circuit is targeted for the latter part of the March Quarter 2022.

Since achieving first concentrate from the coarse circuit, utilisation of the facility has been lower than initially forecast (albeit improving) due to a combination of equipment failures and additional maintenance downtime required to allow key plant items to be replaced

and/or upgraded. This was further impacted by the previously described industry wide labour shortages in the mining sector.

During the period when only the coarse circuit is operating, lower overall lithia recoveries are expected, until such time as the fines circuit is brought online to help maximise lithia recovery.

Full commissioning and ramp-up of the Ngungaju Plant, including improved lithia recoveries, is expected to be achieved from the September 2022 Quarter, at which time targeted annual production capacity is expected to be between 180,000 to 200,000 dmt of spodumene concentrate.

### 3.2 Pilgan Plant improvements project and expansion

Construction of the Pilgan Plant Improvements Project was largely completed in early October 2021, with commissioning and ramp-up of the improved facilities commencing shortly thereafter.

The Pilgan Plant Improvements Project is expected to debottleneck the processing facility to realise additional production capacity from the asset, in particular from the fines flotation circuit. Following completion of the ramp-up of the project (expected within the March 2022 Quarter), the Pilgan Plant's annualised spodumene concentrate production capacity is targeted to increase from approximately ~330,000 dmt to 360-380,000 dmt.

### 3.3 Pilgangoora Incremental expansion (Project name "P680")

Following the successful ramp up and commissioning of both the Ngungaju re-start and the Pilgan Plant Improvements Project, the combined Pilgangoora Operation should achieve an annual spodumene concentrate production of between ~540,000dmt to ~580,000dmt.

Pilbara Minerals progressed study works to support the next phase of incremental expansion for the Pilgan Plant in support of a Financial Investment Decision (FID), targeted for early in the June 2022 Quarter. The next incremental expansion is intended to realise an additional 100,000dmt of production capacity, which will increase total production from the Pilgangoora Operation (across both the Pilgan and Ngungaju operation) up to 680,000tpa.

The project name being utilised is "P680", representing the total installed production capacity (680ktpa) following completion of the expansion project.

Pilbara Minerals will commence revised studies for the subsequent incremental expansion beyond the P680 project. The next expansion is targeted to increase total Pilgangoora production capacity to up to 1Mtpa and will be referred to as the "P1000 project". The target date for FID for the P1000 project is expected in the December Quarter of 2022.

### 3.4 Mid-Stream Project and Calix Test work

Following the execution of a Memorandum of Understanding (**MOU**) in May 2021 (refer ASX Announcement dated 11 May 2021) between Pilbara Minerals and Calix Limited, a Scoping Study for a Mid-Stream Product Demonstration Plant is now nearing completion. The Scoping Study aims to support the development of a Demonstration Plant at the Pilgangoora Operation to produce lithium salts from fines-flotation spodumene concentrate, supporting a pathway towards potential future commercial production of value-added lithium products at Pilgangoora.

The Scoping Study (undertaken by Lycopodium Minerals in conjunction with the Pilbara Minerals and Calix teams) has been assessing the potential development of a new refining process to produce high purity lithium phosphate precipitate from Calix-calcined fines



spodumene concentrate supplied from the Pilgangoora Operation. This concentrated lithium salt from the Pilgangoora Operation ("Mid-Stream Product") could support downstream lithium raw material and cathodes demand.

Technical work contributing to the Scoping Study (including test work, process design and engineering) is now complete, with calcination test work at Calix's pilot scale BATMn reactor confirming high conversion rates (>95% for Alpha to Beta phase transition), for fine flotation spodumene concentrate<sup>1</sup> supplied from Pilgangoora.

Completion of the commercial and economic evaluation contributing to the Scoping Study is expected early in 2022, following which a final review of the results will be undertaken by the Boards of Pilbara Minerals and Calix, with results released shortly thereafter.

Subject to the results being commercially and technically satisfactory to both Pilbara Minerals and Calix, both parties then intend to progress negotiations for the formation of a joint venture and agree a work program to develop the Demonstration Plant at the Pilgangoora Operation. In addition, the joint venture will ultimately seek to commercialise the Mid-Stream Product's process technology in respect of lithium phosphate applications on a worldwide basis.

## 4. Ore Reserves

During the Quarter, the Company announced in its ASX release dated 6 October 2021 a material increase in the Pilgangoora Ore Reserve to 162 million tonnes. The upgraded Ore Reserve resulting from the discovery of new pegmatite domains together with the integration of the Ngungaju Resource, has led to a 54% increase in total Proved and Probable Ore Reserve Tonnes at Pilbara's 100%-owned Pilgangoora Lithium-Tantalum Project to 162 Mt grading 1.2% Li<sub>2</sub>O, 100 ppm Ta<sub>2</sub>O<sub>5</sub> and 1.0% Fe<sub>2</sub>O<sub>3</sub>. The Ore Reserve now contains 1.9 million tonnes of lithium oxide, an increase of 47% from the 2020 Pilgangoora Reserve. The restated and combined Ore Reserve (inclusive of the former Altura Lithium Operations) reinforces the Pilgangoora Project's position as one of the world's premier hard rock lithium operations.<sup>2</sup>

## 5. Exploration and Geology

Exploration activities for the Quarter included reverse circulation (RC) and geotechnical drilling programs within the Pilgangoora Project area. In addition, a modest RC drilling program was undertaken at the Mt York Gold Project.

### 5.1 Pilgangoora Project (Pilbara Minerals 100%)

Pilbara Minerals completed the balance of an RC sterilisation drilling program targeting a potential alternate waste dump location to the west of the Central Pit area. A total of 16 holes for 1,562 metres were drilled during the Quarter (refer Appendix 1). Several holes intercepted pegmatites of significant thickness. Due to a large backlog of samples at the laboratory, results remained outstanding at Quarter end.

The Company also completed 111 RC grade control holes for 2,410m within the South and Central pits during the Quarter.

A geotechnical diamond drilling program which included two HQ3 core holes for 117.6 metres was completed by Seismic Drilling Australia. Drilling was undertaken on the

<sup>2</sup> Pilbara Minerals confirms that it is not aware of any new information that materially affects the information included in its ASX release dated 6 October 2021 and that all material assumptions and technical parameters underpinning the ore reserve estimates continue to apply and have not materially changed.

west wall of the Central Pit and formed part of a more extensive diamond drilling program designed to assess geotechnical properties for the expanded Life of Mine pit designs.

Orientation surface geochemistry was also undertaken within the Pilgangoora Operation area. A total of 77 soil samples were collected and submitted for analysis at Nagrom Laboratories. Pending the success of this program, an extensive grid-based program will be undertaken over the remainder of the new frontier greenstone terrain proximal to the Pilgangoora mine corridor.

## 5.2 Regional Projects (Pilbara Minerals 100%)

Exploration over the Company's regional tenements included desk top studies, field reconnaissance as well as a short RC drilling program at the Mt York prospect on E45/2241 (refer Annexure B). Drilling was undertaken by Mt Magnet Drilling Pty Ltd using a truck mounted RCD300 drill rig and included five holes for 512m. This modest drill program was undertaken to maintain the minimum tenement expenditure requirements and to add value to Pilbara Minerals' exploration tenure base. Results are pending.

## 5.3 Mt Francisco JV (Pilbara Minerals Limited 70%, Atlas Iron 30%)

No exploration work was undertaken at Mt Francisco during the Quarter.

# 6. Corporate

## 6.1 POSCO Downstream JV (DSJV)

During the Quarter, Pilbara Minerals concluded its negotiations with POSCO and executed a Shareholders Agreement for the formation of an incorporated joint venture (**JV**), to develop and operate a 43ktpa lithium hydroxide monohydrate (LHM) Conversion Facility in South Korea (Refer ASX release dated 26 October 2021).

The Conversion Facility will be developed as two production trains, each with 21.5ktpa LHM production capacity.

Pilbara Minerals will initially own an 18% interest in the JV (largely funded from a A\$79.6M Convertible Bond provided by POSCO) with the right for Pilbara Minerals to increase its interest to 30%. Pilbara Minerals will supply 315ktpa of chemical grade spodumene concentrate on commercial terms to the jointly owned Conversion Facility. This will be sourced from Pilbara Minerals' existing installed production capacity at the Pilgangoora Operation (inclusive of the recently restarted Ngungaju Plant). Product sold under the offtake agreement will be at prevailing market prices for chemical grade spodumene concentrate sold on a CIF basis.

The project development timeline for the Conversion Facility will see major construction works likely to commence towards the end of the March Quarter 2022, with detailed engineering and early works already underway. Construction of the first train of the Conversion Facility is expected to be completed by mid-2023, with the second train to be completed approximately three months later.

The formation of the JV including completion occurring under the Shareholders Agreement and the Company subscribing for its 18% equity interest, remains conditional on certain conditions precedent. These include the parties finalising an initial budget for estimated construction and ramp up costs following completion of engineering and

design works, as well as certain routine foreign investment regulatory approvals in South Korea. These conditions are expected to be finalised during the March 2022 Quarter.

Participation in the JV supports the Company's long-term strategy of becoming a fully integrated raw materials company with a globally diversified customer base.

## 6.2 BMX sales trading platform

During the Quarter, the Company completed its third cargo auction via its newly established Battery Material Exchange (**BMX**) platform.

The BMX platform provides Pilbara Minerals with a further avenue for sales growth, offering interested parties with access to current and future unallocated spodumene concentrate product from the Company's operations, including from the Ngungaju Plant following its recommencement.

A cargo of 10,000dmt at a target grade of 5.5% lithia was presented for sale on the digital platform on 26 October 2021, with a deferred delivery date in February 2022.

As with the previous two auctions, strong interest was received in both participation and bidding by a broad range of buyers. Parties placed 25 bids online during the 45-minute auction window, with the Company considering the bidding to be very strong in light of the deferred delivery date.

Pilbara Minerals accepted the highest bid of USD\$2,350/dmt (SC5.5, FOB Port Hedland basis), which on a pro rata basis for lithia content (inclusive of freight costs) equates approximately to a price of USD\$2,629/dmt (SC6.0, CIF China basis).

Given the strong margins yielded through the BMX trading platform to date, Pilbara Minerals expects to channel more concentrate sales through the platform, including concentrate generated from the recommencement of the Ngungaju Plant.

Further BMX auctions are expected to be held during the March 2022 Quarter, subject to sufficient available product from both processing facilities.

## 6.3 Revision of Finance Facilities

During the Quarter, Pilbara Minerals finalised an agreement with its existing lenders to increase the Syndicated Finance Facility by US\$20M to support the restart of the Ngungaju Plant.

The existing syndicated lenders, comprising BNP Paribas, the Clean Energy Finance Corporation (CEFC), Société Générale and the Industrial and Commercial Bank of China (ICBC) (collectively, the Existing Financiers), agreed to increase the syndicated debt facility by US\$20M to US\$130M. The US\$20M increase was drawdown during the Quarter, with the proceeds primarily used to fund the staged restart of the Ngungaju Plant.

The terms and conditions of the expanded Syndicated Finance Facility, including tenor, repayment schedule, financial covenants and pricing, remain substantially the same as those executed under the original existing debt facility in July 2020 (refer ASX Announcement dated 30 July 2020). The debt facility's underlying security has been expanded to include the assets associated with the Ngungaju Plant.

At the same time, BNP Paribas approved a US\$10M increase in the Working Capital Facility to US\$25M. The US\$25M Working Capital Facility currently remains undrawn.

The term of the Working Capital Facility has been extended to November 2023, while the maturity of the Syndicated Finance Facility remains unchanged at 30 June 2025.

## 6.4 Financial Results from Operations

The Company shipped 78,679dmt of spodumene concentrate for the Quarter, including 3,612dmt of first product produced from the Ngungaju coarse circuit.

Average SC6.0 market reference prices continued to increase during the Quarter, resulting in substantially higher pricing being received from customers compared to the September Quarter 2021.

Actual average reference pricing received for spodumene concentrate deliveries during the Quarter was in the range of USD\$1750-\$1800/dmt (SC6.0 basis), inclusive of estimated final pricing adjustments.

Pursuant to the terms of sale, the increasing pricing dynamic evident since the beginning of the December Quarter has led to positive final pricing adjustments of ~A\$8.7M associated with provisionally priced cargoes shipped during the December Quarter 2021, with these cash proceeds expected to be received during the March 2022 Quarter (pending final pricing outcomes).

A unit operating cost<sup>3</sup> of US\$587/dmt (CIF China) was achieved for the Pilgan operation for the Quarter, being A\$805/dmt at a quarterly average AUD:USD exchange rate of 0.7287 (September Quarter: US\$445/dmt; A\$605/dmt at an average quarterly AUD:USD exchange rate of 0.7351).

Excluding freight and royalty costs, the unit operating cost is re-stated at US\$420/dmt (FOB Port Hedland) for market comparative purposes (September Quarter: US\$328/dmt).

The US\$142/dmt increase in unit operating cost compared to the previous Quarter is largely attributable to higher royalties linked to significantly higher selling prices (US\$56/dmt), as well as specific activities required to be undertaken to facilitate the tie-in, commissioning and ramp up of the Plant Improvement Project, which impacted production rates.

Lower production rates were attributed to unplanned down-time events, lower overall lithia recovery (~65% at the Pilgan Plant), less than optimal ore feed being presented to the plant, and further exacerbated by the impact of not being able to access key personnel in mining, production and maintenance roles. Unit operating costs are expected to return to previous levels once steady state nameplate capacity is achieved, save for the impact of higher royalty costs linked to higher selling prices.

## 6.5 Cash Balance

Pilbara Minerals closed the Quarter with a cash balance of \$245M, inclusive of \$53.8M of irrevocable bank letters of credit for shipments completed within the Quarter. This represents a \$107.7M increase over the equivalent balance of \$137.3M as at 30 September 2021.

A record cashflow from operations of \$115.5M was generated on the back of positive market dynamics, \$26.6M was spent on capital activities, and a net \$22.1M was received from financing activities following a US\$20M increase in the Syndicated Finance Facility to fund the restart of the Ngungaju operation.

During the Quarter, Pilbara Minerals received:

- proceeds of \$177.2M from customer sales associated with production from the Pilgan Plant (inclusive of A\$9.8M of receipts following finalisation of final pricing

<sup>3</sup> Unit operating costs include mining, processing, transport, state and private royalties, native title costs, port, shipping/freight, and site based general and administration costs and are net of Ta<sub>2</sub>O<sub>5</sub> by-product credits.

Unit operating costs are calculated on an incurred basis (including accruals), include inventory movements, and any credits associated with capitalised deferred waste mine stripping costs.

adjustments for September Quarter cargoes that were provisionally priced);

- proceeds of \$26.7M (net of \$0.8M of transaction costs) following the drawdown of US\$20M following the increase in the Syndicated Finance Facility;
- net receipts of \$2.0M attributable to the restart of the Ngungaju operation following the first sale of 3,612dmt of Ngungaju spodumene concentrate during the Quarter (net of operating costs of \$5.8M); and
- proceeds of \$2.4M from the exercise of share options.

Major cash outflows and movements during the Quarter included:

- \$61.7M on operating costs at the Pilgan Project, including the early repayment of \$1.7M associated with royalty relief provided by the State Government in prior Quarters;
- \$26.6M on capital costs related to the Pilgan Plant Improvement Project, the re-start of the Ngungaju plant, and capitalised mine waste stripping costs associated with mining activities (\$6.5M);
- \$2.0M on interest paid under the USD Syndicated Debt Facility;
- \$2.6M principal debt repayment to comply with the cash sweep mechanism under the terms of the USD Syndicated Debt Facility;
- \$4.3M on payroll, administration and corporate costs; and
- \$2.9M on exploration and evaluation work and feasibility studies.

The US\$25M Working Capital Facility provided by BNP Paribas remains undrawn.

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*Release authorised by Ken Brinsden, Pilbara Minerals Limited's Managing Director.*

## MORE INFORMATION

### About Pilbara Minerals

Pilbara Minerals is the leading ASX-listed lithium company, owning 100% of the world's largest, independent hard-rock lithium operation. Located in Western Australia's resource-rich Pilbara region, the Pilgangoora Operation produces a spodumene and tantalite concentrate. The significant scale and quality of the operation has attracted a consortium of high quality, global partners including Ganfeng Lithium, General Lithium, Great Wall Motor Company, POSCO, CATL and Yibin Tianyi.

While it continues to deliver a low-cost, quality spodumene to market, Pilbara Minerals is pursuing a growth and diversification strategy to become a sustainable, low-cost lithium producer and fully integrated lithium raw materials and chemicals supplier in the years to come.

Through execution of this strategy, Pilbara Minerals is positioned to become a major player in the rapidly growing lithium supply chain, underpinned by increasing demand for clean energy technologies such as electric vehicles and energy storage as the world pursues a sustainable energy future.



## Competent Person's Statement

The information in this ASX release that relates to Exploration Results and Exploration Targets is based on and fairly represents information and supporting documentation prepared by Mr John Holmes (Exploration Manager of Pilbara Minerals Limited). Mr Holmes is a shareholder of Pilbara Minerals. Mr Holmes is a member of the Australasian Institute of Geoscientists and has sufficient experience of relevance to the styles of mineralisation and types of deposits under consideration and to the activities undertaken to qualify as a Competent Person as defined in the 2012 Edition of the Joint Ore Reserves Committee (JORC) Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Holmes consents to the inclusion in this report of the matters based on his information in the form and context in which they appear.

## No New Information Statement

Information in this ASX release relating to the Ore Reserve estimates is extracted from the ASX releases dated 6 October 2021. Pilbara Minerals confirms that it is not aware of any new information or data that materially affects the information included in this announcement and that all material assumptions and technical parameters underpinning the Ore Reserve estimates continue to apply and have not materially changed. Pilbara Minerals confirms that the form and context in which the competent persons' findings are presented in this ASX release have not been materially modified from the original market announcements.

## Forward Looking Statements and Important Notice

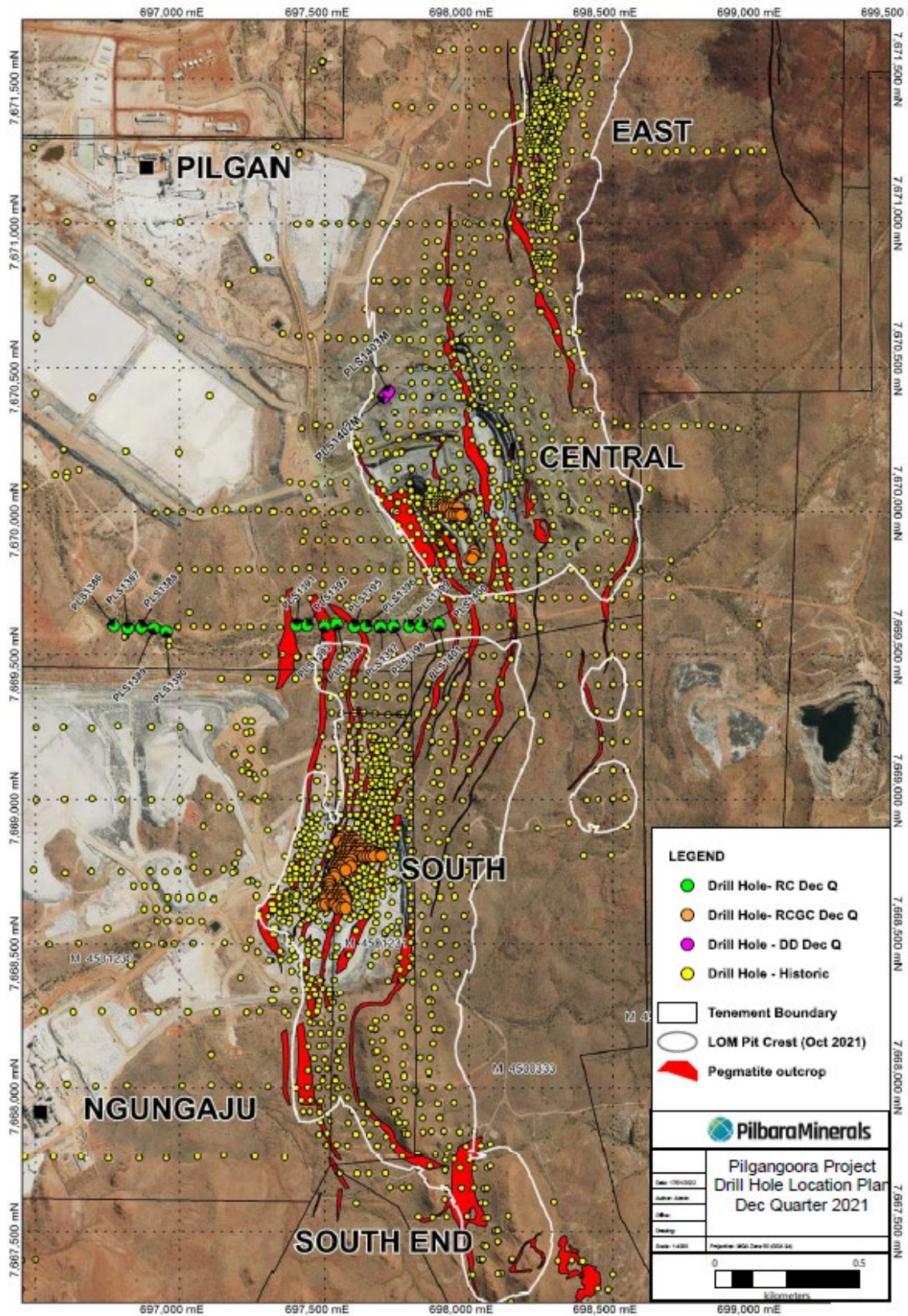
This announcement may contain some references to forecasts, estimates, assumptions, and other forward-looking statements. Although the Company believes that its expectations, estimates, and forecast outcomes are based on reasonable assumptions, it can give no assurance that they will be achieved. They may be affected by a variety of variables and changes in underlying assumptions that are subject to risk factors associated with the nature of the business, which could cause actual results to differ materially from those expressed herein.

All references to dollars (\$) and cents in this announcement are to Australian currency, unless otherwise stated.

## Appendix 1 - Drill Hole Collars (December Quarter 2021)

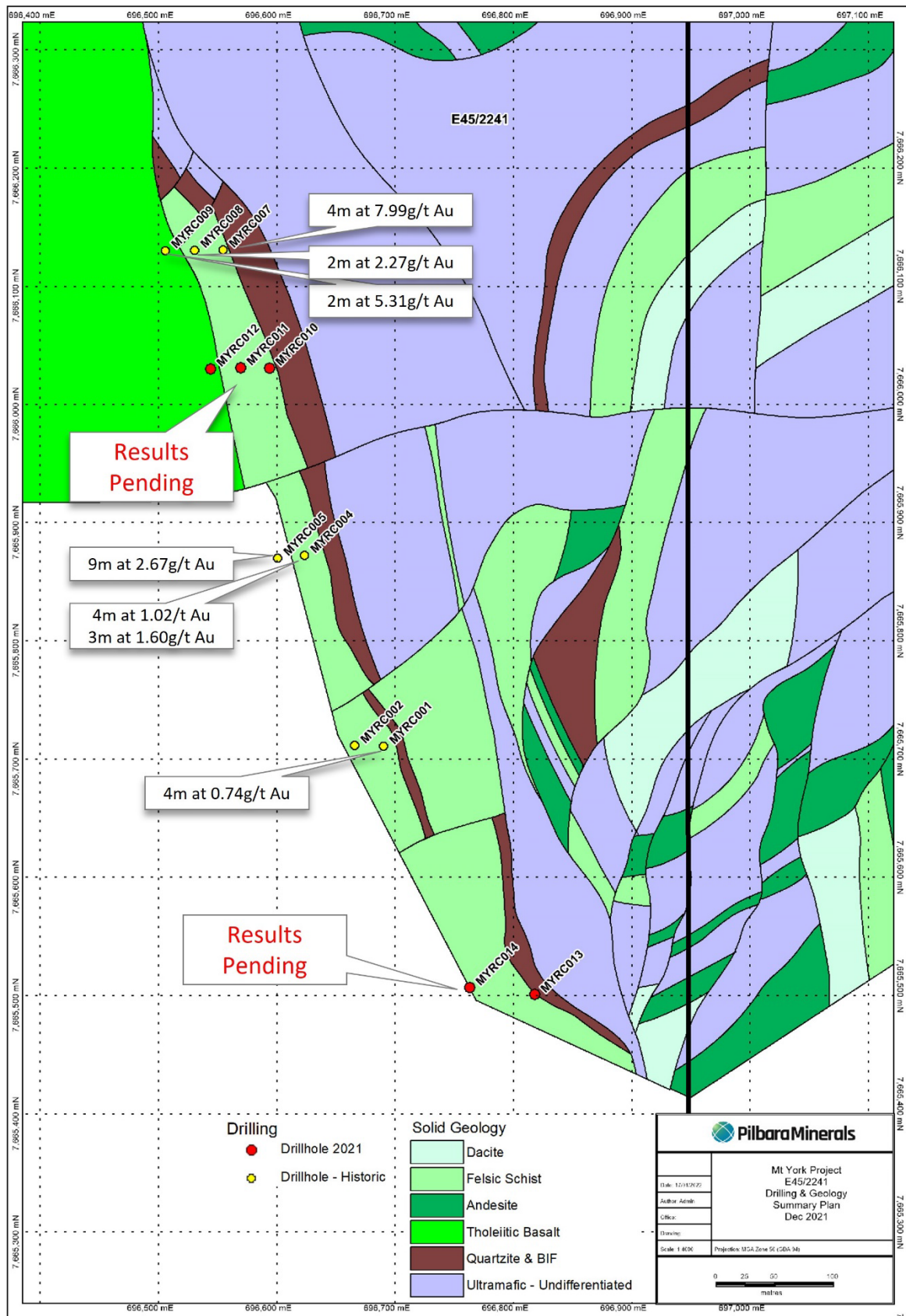
Prospect	Hole ID	North GDA94	East GDA94	Dip	Azimuth	Depth
Central - Sterilisation	PLS1386	7669601	696771	-60	270	100
Central - Sterilisation	PLS1387	7669593	696820	-60	270	100
Central - Sterilisation	PLS1388	7669596	696868	-60	270	100
Central - Sterilisation	PLS1389	7669592	696912	-60	270	100
Central - Sterilisation	PLS1390	7669582	696954	-60	270	102
Central - Sterilisation	PLS1391	7669602	697400	-60	270	100
Central - Sterilisation	PLS1392	7669602	697439	-60	270	100
Central - Sterilisation	PLS1393	7669599	697499	-60	270	100
Central - Sterilisation	PLS1394	7669606	697540	-60	270	100
Central - Sterilisation	PLS1395	7669598	697603	-60	270	100
Central - Sterilisation	PLS1396	7669598	697642	-60	270	100
Central - Sterilisation	PLS1397	7669598	697694	-60	270	84
Central - Sterilisation	PLS1398	7669599	697738	-60	270	76
Central - Sterilisation	PLS1399	7669599	697793	-60	270	100
Central - Sterilisation	PLS1400	7669600	697835	-60	270	100
Central - Sterilisation	PLS1401	7669603	697895	-60	270	100
Central Pit - Geotech	PLS1402M	7670399	697706	-60	305	55.8
Central Pit - Geotech	PLS1403M	7670419	697721	-60	270	61.8
Mt York	MYRC010	7666031	696594	-60	90	50
Mt York	MYRC011	7666031	696570	-60	90	70
Mt York	MYRC012	7666030	696544	-60	90	96
Mt York	MYRC013	7665501	696818	-60	90	118
Mt York	MYRC014	7665507	696763	-60	90	178





Annexure A: Drill Hole Location Plan - December Quarter 2021





Annexure B – Mt York Drill Hole Location Plan

## JORC Code, 2012 Edition – Table

### Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
<b>Sampling techniques</b>	<i>Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.</i>	<ul style="list-style-type: none"><li>• PLS completed a total of 134 holes for 4,601 metres during the December quarter. This included 2,074m of exploration RC drilling, 2,410m infill RC grade control drilling, and 117.6m of diamond drill core. Exploration and diamond holes are listed in Annexure A.</li></ul>
	<i>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</i>	<ul style="list-style-type: none"><li>• For the RC drilling at Pilgangoora completed this quarter, samples were collected every metre in pegmatite zones and 2 metres into footwall &amp; hanging wall country rock.</li><li>• PLS diamond core (HQ3) is generally sampled by taking a 15-20mm fillet at intervals dependent on ore type within the pegmatite zones. Sampling may be undertaken once geotechnical studies have been completed.</li><li>• RC drill holes at the Mt York prospect holes were sampled every metre, with samples split on the rig using a cyclone splitter. The sampling system consisted of a rig mounted cyclone with cone splitter and dust suppression system. The cyclone splitter was configured to split the cuttings at 85% to waste (to be captured in 600mm x 900mm green plastic mining bags) and 15% to the sample port in draw-string calico sample bags (10-inch by 14-inch).</li><li>• In addition to the 1m split samples, 4m composite samples were</li></ul>



Criteria	JORC Code explanation	Commentary
	<p>Aspects of the determination of mineralisation that are Material to the Public Report.</p> <p>In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.</p>	<p>collected at Mt York.</p> <ul style="list-style-type: none"> <li>• Exploration drill holes in 2021 were all RC, with samples split at the rig, samples are then sent to Nagrom laboratory in Perth and analysed for a suite of multi-elements. Analysis was completed by XRF and ICP techniques.</li> <li>• Exploration drill holes at Mt York were all RC, with samples split at the rig, samples are then sent to Nagrom laboratory in Perth and analysed for a suite of multi-elements including Au, As, Cu, Ni, Ag, Pb and S.</li> <li>• Diamond core is generally sampled at lengths were determined by mineralisation logged in the core. Half core samples through mineralised zones maybe sent to the laboratory for analysis. Drill core from this program was principally collected for geotechnical studies.</li> </ul>
<b>Drilling techniques</b>	<p>Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).</p>	<ul style="list-style-type: none"> <li>• Diamond drilling was completed by Seismic Australia, using a platform mounted rig with numerous support vehicles.</li> <li>• Exploration RC Drilling in 2021 was completed by Mt Magnet Drilling utilising an RCD300-2 track mounted drilling rig with a truck mounted booster &amp; auxiliary compressor (900cfm/350psi) coupled to a V8 booster up to 1000psi.</li> <li>• Drilling used a reverse circulation face sampling hammer. The sampling system consisted of a rig mounted cyclone with cone splitter and dust suppression system.</li> </ul>
<b>Drill sample recovery</b>	<p>Method of recording and assessing core and chip sample recoveries and results assessed.</p>	<ul style="list-style-type: none"> <li>• Recoveries for PLS RC and diamond holes were virtually all dry and overwhelmingly logged as "good."</li> </ul>
	<p>Measures taken to maximise sample recovery and ensure representative nature of the samples.</p>	<ul style="list-style-type: none"> <li>• Whilst drilling through the pegmatite, rods were flushed with air after each metre drilled. In addition, moist or wet ground</li> </ul>

Criteria	JORC Code explanation	Commentary
		<p>conditions resulted in the cyclone being washed out between each sample run.</p> <ul style="list-style-type: none"> <li>Loss of fines as dust was reduced by injecting water into the sample pipe before it reached the cyclone. This minimises the possibility of a positive bias whereby fines are lost, and heavier, tantalum bearing material, is retained.</li> </ul>
	<i>Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.</i>	<ul style="list-style-type: none"> <li>No material bias has been identified.</li> </ul>
<b>Logging</b>	<i>Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.</i>	<ul style="list-style-type: none"> <li>1m samples were laid out in lines of 20 or 30 samples with cuttings collected and geologically logged for each interval and stored in 20 compartment plastic rock-chip trays with hole numbers and depth intervals marked (one compartment per 1m). Geological logging information was recorded directly onto digital logging system and information validated and transferred electronically to Database administrators in Perth. The rock-chip trays are stored on site at Pilgangoora in a secured containerised racking library.</li> </ul>
	<i>Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.</i>	<ul style="list-style-type: none"> <li>1m samples were laid out in lines of 20 or 30 samples with cuttings collected and geologically logged for each interval and stored in 20 compartment plastic rock-chip trays with hole numbers and depth intervals marked (one compartment per 1m). Geological logging information was recorded directly onto digital logging system (OCRIS) and information validated and transferred electronically to Database administrators in Perth. The rock-chip trays are stored on site at Pilgangoora in a shelved 40 ft sea container.</li> <li>Selected intervals of PLS Diamond core were transported to</li> </ul>

Criteria	JORC Code explanation	Commentary
		<p>Perth for geotechnical testwork. The remainder of core has been stored onsite at Pilgangoora.</p> <ul style="list-style-type: none"> <li>All remnant drill core (excluding 2019 PQ core) is currently stored on pallets at Pilgangoora and is in the process of being transferred into a covered storage facility.</li> </ul>
	<i>The total length and percentage of the relevant intersections logged.</i>	<ul style="list-style-type: none"> <li>The database contains lithological data for all holes in the database.</li> </ul>
<b>Sub-sampling techniques and sample preparation</b>	<p><i>If core, whether cut or sawn and whether quarter, half or all core taken.</i></p> <p><i>If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.</i></p> <p><i>For all sample types, the nature, quality and appropriateness of the sample preparation technique.</i></p>	<ul style="list-style-type: none"> <li>RC samples in 2021 were generally dry and split at the rig using a cyclone splitter, which is appropriate and industry standard.</li> <li>HQ diamond holes have not been cut for sampling.</li> </ul>
	<i>Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.</i>	<ul style="list-style-type: none"> <li>PLS RC drilling contains QC samples (field duplicates and laboratory pulp splits, selected CRM's for PLS). Assay results not expected till February 2022.</li> <li>QAQC is maintained regularly on the Nagrom results . Assay results not expected till February 2022.</li> </ul>
	<i>Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.</i>	<ul style="list-style-type: none"> <li>Field duplicates were taken approximately every 20m, and standards and blanks every 50 samples.</li> </ul>
	<i>Whether sample sizes are appropriate to the grain size of the material being sampled.</i>	<ul style="list-style-type: none"> <li>Drilling sample sizes are considered to be appropriate to correctly represent the tantalum and lithium mineralization at Pilgangoora based on the style of mineralization (pegmatite) and the thickness and consistency of mineralization.</li> </ul>
<b>Quality of assay data and</b>	<i>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</i>	<ul style="list-style-type: none"> <li>PLS samples to be assayed by Nagrom Perth laboratory and analysed for a suite of 9 elements via ME-MS91 Sodium Peroxide</li> </ul>

Criteria	JORC Code explanation	Commentary
<i>laboratory tests</i>		<p>for ICPMS finish and Peroxide fusion with an ME-ICP89 ICPAES finish.</p> <ul style="list-style-type: none"> <li>Grade control samples were submitted to Nagrom Laboratories in Perth and analysed for a suite of 25 elements. Samples were subject to a sodium peroxide fusion and analysed using ICPOES and ICPMS techniques.</li> </ul>
	<i>For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.</i>	<ul style="list-style-type: none"> <li>No geophysical tools were used to determine any element concentrations used.</li> </ul>
	<i>Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.</i>	<ul style="list-style-type: none"> <li>Duplicates of the samples were taken at twenty metre intervals with blanks and standards inserted every 50m.</li> <li>Drilling contains QC samples (field duplicates, blanks and standards plus laboratory pulp splits, and laboratory internal standards). Results unavailable at the time of reporting.</li> </ul>
<i>Verification of sampling and assaying</i>	<i>The verification of significant intersections by either independent or alternative company personnel.</i>	<ul style="list-style-type: none"> <li>No twin holes were drilled.</li> </ul>
	<i>The use of twinned holes.</i>	
	<i>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</i>	<ul style="list-style-type: none"> <li>An electronic relational database containing collars, surveys, assays and geology is maintained by Trepanier Pty Ltd, an Independent Geological consultancy.</li> </ul>
	<i>Discuss any adjustment to assay data.</i>	<ul style="list-style-type: none"> <li>Tantalum was reported as Ta<sub>2</sub>O<sub>5</sub> % and converted to ppm for the estimation process.</li> <li>A two-step adjustment has been applied to the Fe<sub>2</sub>O<sub>3</sub> assays to account for (i) contamination of pulps by the steel bowl at the grinding stage, and (ii) contamination of RC chips with the drill bit and tube wear with increasing hole depth. Step one is to</li> </ul>

Criteria	JORC Code explanation	Commentary
		subtract 0.33% from all Nagrom Fe <sub>2</sub> O <sub>3</sub> assays and 0.47% from all ALS Fe <sub>2</sub> O <sub>3</sub> assays, step 2 is to subtract a regressed factor by depth from all PLS Minerals, Altura and historic RC samples. No second factor has been applied to the PLS or Altura diamond core Fe <sub>2</sub> O <sub>3</sub> assays.
<b>Location of data points</b>	<i>Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.</i>	<ul style="list-style-type: none"> <li>All 2021 RC holes were surveyed using DGPS in GDA94, Zone 50. Down hole surveying of drill holes was conducted using a Gyro tool. Measurements were recorded at the bottom of each hole and every 10m up hole for vertical holes and continuous readings for angle holes.</li> <li>Drill hole collar locations were surveyed at the end of each program by a differential GPS (DGPS).</li> </ul>
	<i>Specification of the grid system used.</i>	<ul style="list-style-type: none"> <li>The grid used was MGA (GDA94, Zone 50)</li> </ul>
	<i>Quality and adequacy of topographic control.</i>	<ul style="list-style-type: none"> <li>The topographic surface used was supplied by Pilbara Minerals. Drone surveys are undertaken on a monthly basis in the active mining area and this information is merged into a master topographic surface.</li> </ul>
<b>Data spacing and distribution</b>	<i>Data spacing for reporting of Exploration Results.</i>	<ul style="list-style-type: none"> <li>Drilling spacings for the 2021 exploration RC holes varied between 50m to 75m apart.</li> <li>Drill spacings for the grade control drilling were set out on a 12.5m offset grid where access permitted.</li> </ul>
	<i>Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.</i>	<ul style="list-style-type: none"> <li>The interpretation of the mineralised domains is supported by a moderate drill spacing, plus both geological zones and assay grades can be interpreted with confidence.</li> </ul>
	<i>Whether sample compositing has been applied.</i>	<ul style="list-style-type: none"> <li>No compositing was necessary, as all samples were taken at 1m intervals.</li> </ul>



Criteria	JORC Code explanation	Commentary
<b>Orientation of data in relation to geological structure</b>	<i>Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.</i>	<ul style="list-style-type: none"> <li>The mineralisation dips between 20 and 60 degrees at a dip direction between 050 and 115 degrees for the majority of the domains.</li> <li>The drilling orientation and the intersection angles are deemed appropriate at Mt York.</li> </ul>
	<i>If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.</i>	<ul style="list-style-type: none"> <li>No orientation-based sampling bias has been identified.</li> </ul>
<b>Sample security</b>	<i>The measures taken to ensure sample security.</i>	<ul style="list-style-type: none"> <li>Chain of custody for PLS holes were managed by PLS personnel.</li> </ul>
<b>Audits or reviews</b>	<i>The results of any audits or reviews of sampling techniques and data.</i>	<ul style="list-style-type: none"> <li>The collar and assay data have been reviewed by compiling a SQL relational database. This allowed some minor sample numbering discrepancies to be identified and amended.</li> <li>Drilling locations and survey orientations have been checked visually in 3 dimensions and found to be consistent.</li> <li>The collar and assay data have been reviewed by checking all of the data in the digital database against hard copy logs.</li> <li>All PLS assays are being sourced directly from Nagrom laboratory.</li> </ul>

## Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
<b><i>Mineral tenement and land tenure status</i></b>	<i>Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites</i>	<ul style="list-style-type: none"> <li>• PLS owns 100% of mining tenements M45/1256, M45/333, M45/511, M45/1266, M45/1230 and M45/1231.</li> <li>• The Pilgangoora resource (including former Altura Lithium Operations) is located within M45/1256, M45/333, M45/1230 and M45/1231 which are 100% owned by PLS Minerals Limited.</li> <li>• The Lynas Find resource is located within M45/1266</li> <li>• The Mt York Prospect is located on E45/2241 which is registered in the name of Pilgangoora Operations Pty Ltd.</li> <li>• The tenement is 100% owned by Pilgangoora Operations Pty Ltd.</li> </ul>
	<i>The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.</i>	<ul style="list-style-type: none"> <li>• No known impediments.</li> </ul>
<b><i>Exploration done by other parties</i></b>	<i>Acknowledgment and appraisal of exploration by other parties.</i>	<ul style="list-style-type: none"> <li>• Talison completed RC holes in 2008</li> <li>• GAM completed RC holes between 2010 and 2012.</li> <li>• Dakota Minerals Ltd completed diamond and RC holes in 2016.</li> <li>• Altura completed Diamond and RC holes between 2010 and 2018. Altura completed two phases of diamond drilling (phase 1 2011-2013 &amp; phase 2 2016) with a total of 18 holes drilled</li> </ul>

Criteria	JORC Code explanation	Commentary
<b>Geology</b>	<i>Deposit type, geological setting and style of mineralisation.</i>	<ul style="list-style-type: none"> <li>The Pilgangoora pegmatites are part of the later stages of intrusion of Archaean granitic batholiths into Archaean metagabbros and metavolcanics. Tantalum mineralisation occurs in zoned pegmatites that have intruded a sheared metagabbro.</li> <li>Gold mineralisation within the Mount York district, is thought to be orogenic (Groves et al., 2019) and generated during the D3 Mosquito Creek Orogeny ca. 2890 Ma (Neumayr et al, 1998).</li> <li>An appropriate model for gold mineralisation in the Mount York district involves the fluxing of high-pressure gold-bearing hydrothermal fluids from late-D3 shear zones into the nearby network of faults and veins, during episodes.</li> <li>The prospect area lies over a NW-trending structure which links in the south with the Mount York shear zone at the Main Hill and Breccia Hill gold deposits.</li> </ul>
<b>Drill hole Information</b>	<i>A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes, including easting and northing of the drill hole collar, elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar, dip and azimuth of the hole, down hole length and interception depth plus hole length. If the exclusion of this information is justified on the</i>	<ul style="list-style-type: none"> <li>Refer to Appendix 1.</li> </ul>

Criteria	JORC Code explanation	Commentary
	<i>basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.</i>	
<b>Data aggregation methods</b>	<p><i>In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.</i></p> <p><i>Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.</i></p> <p><i>The assumptions used for any reporting of metal equivalent values should be clearly stated.</i></p>	<ul style="list-style-type: none"> <li>• Samples are currently awaiting analysis in Perth laboratory. Results pending.</li> </ul>
<b>Relationship between mineralisation widths and intercept lengths</b>	<p><i>These relationships are particularly important in the reporting of Exploration Results.</i></p> <p><i>If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.</i></p> <p><i>If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').</i></p>	<ul style="list-style-type: none"> <li>• Results Pending.</li> </ul>
<b>Diagrams</b>	<i>Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any</i>	<ul style="list-style-type: none"> <li>• Annexure A and B shows the location of drill holes completed during the December quarter.</li> </ul>

Criteria	JORC Code explanation	Commentary
	<i>significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.</i>	
<b>Balanced reporting</b>	<i>Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.</i>	<ul style="list-style-type: none"> <li>Comprehensive reporting of 2021 drill hole details has been reported. Analytical results currently pending.</li> </ul>
<b>Other substantive exploration data</b>	<i>Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.</i>	<ul style="list-style-type: none"> <li>All meaningful &amp; material exploration data has been reported.</li> </ul>
<b>Further work</b>	<i>The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).</i> <i>Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.</i>	<ul style="list-style-type: none"> <li>Further planned drilling aims to test extensions to the currently modelled pegmatites zones and to infill where required to convert Mineral Resources to high confidence classification (i.e. Inferred to Indicated and Indicated to Measured).</li> </ul>