



ASX ANNOUNCEMENT

20 September, 2016

PRE-FEASIBILITY STUDY OUTLINES COMPELLING 4MTPA EXPANSION OPTION FOR PILGANGOORA LITHIUM PROJECT

Outstanding PFS results outline option for a rapid expansion path to meet future demand

Highlights:

- Pilbara completes Pre-Feasibility Study (based on existing project reserves) to assess the option for a future expansion of the Pilgangoora Lithium-Tantalum Project to achieve 4Mtpa run-of-mine ore production and processing capacity, in addition to the 2Mtpa Definitive Feasibility Study released separately today.
- Key results of the PFS on the 4Mtpa expansion option include:
 - LOM average annual production of approximately **564ktpa** of 6% spodumene concentrates (79ktpa LCE) (including 30ktpa of technical grade 6% spodumene concentrate) and **579,000lbs** of tantalite;
 - LOM operating costs further reduced to **US\$180 CFR² per tonne** after Ta₂O₅ by-product credits;
 - Modest incremental capital expenditure estimate of **A\$128M** to expand to 4Mtpa;
 - Projected annual average EBITDA increases to **A\$245M** from A\$121M; and
 - Forecast Net Present Value (NPV³_{10%}, post-tax) increases to **A\$1,165M** from **A\$709M**.
- Expansion option subject to further feasibility, market analysis and Board approval.

Further to the announcement released separately today on the Definitive Feasibility Study (“DFS”) for its Pilgangoora Lithium-Tantalum Project in Western Australia, Pilbara Minerals Ltd (ASX: PLS) is pleased to advise that it has also completed a Pre-Feasibility Study (“PFS”) 4Mtpa expansion option, building on the extensive work completed as part of the DFS.

The decision to complete an additional PFS on the expansion scenario to 4Mtpa was made in light of both the significant increase in the Pilgangoora Resource and Reserve base achieved over the course of the year, the sheer scale and cost competitiveness of Pilgangoora’s future production, and the Company’s view of the potential positive long-term demand outlook for the lithium sector.

The PFS assumes processing capacity at the Pilgangoora Project being doubled to 4Mtpa from year three of the project with a commensurate increase in spodumene concentrate production.

Results from the 4Mtpa processing capacity PFS demonstrate the full potential of the Pilgangoora Project, including its significant scale, ultra-low cost base and product quality inclusive of both chemical and technical grade spodumene concentrate sales. Life-of-mine cash operating costs for the project are US\$180/tonne CFR (net of Ta₂O₅ by-product credits), for a relatively modest additional capital investment of A\$128 million.

Project returns are outstanding with the PFS demonstrating a Project NPV of A\$1.17 billion (10% nominal discount rate, post-tax) and Project IRR of 46.3%. Pilbara will progress further engineering design on the expansion project, with decisions about future project expansion subject to the progress of further studies and future assessment of market conditions by Pilbara’s Board.

“This work has delivered very compelling results which take the Pilgangoora Project to a new level,” said Pilbara Minerals’ Managing Director and CEO, Mr Ken Brinsden.

“The PFS has been able to build on the extensive and high quality work undertaken as part of the DFS, which is outlined in full detail in our DFS announcement released separately today, outlining a compelling technical and financial case to double the size of the project from the 3rd year of operations.

“We have decided to present the key findings of the PFS separately, but in parallel to the DFS, so that investors can make a fair assessment of the true long-term potential of this world-class project,” Mr Brinsden said.

SUMMARY OF KEY 4MTPA PFS OUTCOMES – Compared with the 2Mtpa DFS results

The key outcomes applicable to both the 2Mtpa Definitive Feasibility Study and 4Mtpa Pre-Feasibility Study are set out below:

Study Outcomes	DFS – 2Mtpa Base Case	PFS – 4Mtpa Expansion Option
Estimated Mine Life	36 years	19 years
LOM Project revenue (real)	A\$9.23 billion	A\$9.15 billion
LOM Project EBITDA (pre tax; real)	A\$4.22 billion	A\$4.66 billion
Capital Investment	A\$214 million	A\$342 million
Post-tax NPV³_{10%}	A\$709 million	A\$1,165 million
Internal Rate of Return (IRR)	38.1%	46.3%
LOM cash operating costs¹ (real, net of Ta₂O₅ credits)	US\$207/tonne CFR²	US\$180/tonne CFR²
Project payback	~2.7 years	~3.05 years
Average Annual EBITDA (real)	A\$121 million	A\$245 million
LOM assumed spodumene concentrate price (real)	US\$537/tonne CFR ²	US\$539/tonne CFR ²

1. Cash operating costs include all mining, processing, transport, port, shipping/freight, site based general and administration costs, and an allocation of corporate administration/overhead costs, are net of Ta₂O₅ by-product credits, but exclude state and private royalties and native title costs.
2. CFR (“Cost and Freight”) is a trade term requiring the seller to arrange transport.
3. NPV discount factors are presented on a nominal basis.
4. Capital costs exclude capitalised pre-production operating costs estimated to be \$10M.

PRE-FEASIBILITY STUDY – DISCUSSION

Pilbara’s Pilgangoora feasibility work has been completed to a high standard with the assistance of a group of highly experienced independent consultants and contractors, including:

- Process Plant Infrastructure and Non-Process Infrastructure – Como Engineers;
- Metallurgical Testwork – Como Engineers;
- Geology and Resources – Pilbara Minerals and Trepanier Pty Ltd;
- Mining, Mine Design and Reserves – MiningPlus;
- Tailings Management Facility and Geotechnical – ATC Williams;
- Hydrogeology and Hydrology – Groundwater Resource Management; and
- Financial Modelling – MJA Consulting.

PFS outcomes are based on a life-of-mine average spodumene concentrate price of US\$539/tonne CFR, which is well below the current spot price of approximately US\$650/tonne FOB (SC6.0 basis). The implementation of the 4Mtpa expansion case will be dependent on there being sufficient global demand to support the increase in production. The 4Mtpa expansion case will also result in significant new

tantalite concentrate supply into the market. The Company has therefore discounted its tantalite price deck by 10% to take this into account.

The Company's PFS pricing deck has been based on price forecasts from leading independent commodity forecasters and leading investment banks and brokers including: Roskill, Deutsche Bank, Canaccord and Benchmark Minerals to create a 'consensus' price forecast for both Battery Grade Lithium Carbonate and spodumene concentrate pricing.

PFS product pricing and sales revenue outcomes reflect the pricing model agreed under the General Lithium off-take model (which references spodumene pricing to the Battery Grade lithium carbonate price), with the remaining concentrate sales outside the General Lithium contract referencing the consensus spodumene price forecast.

Key inclusions for consideration in the PFS were:

- an increase in the processing capacity from 2Mtpa to 4Mtpa; and
- inclusion of a Technical Grade spodumene concentrate stream.

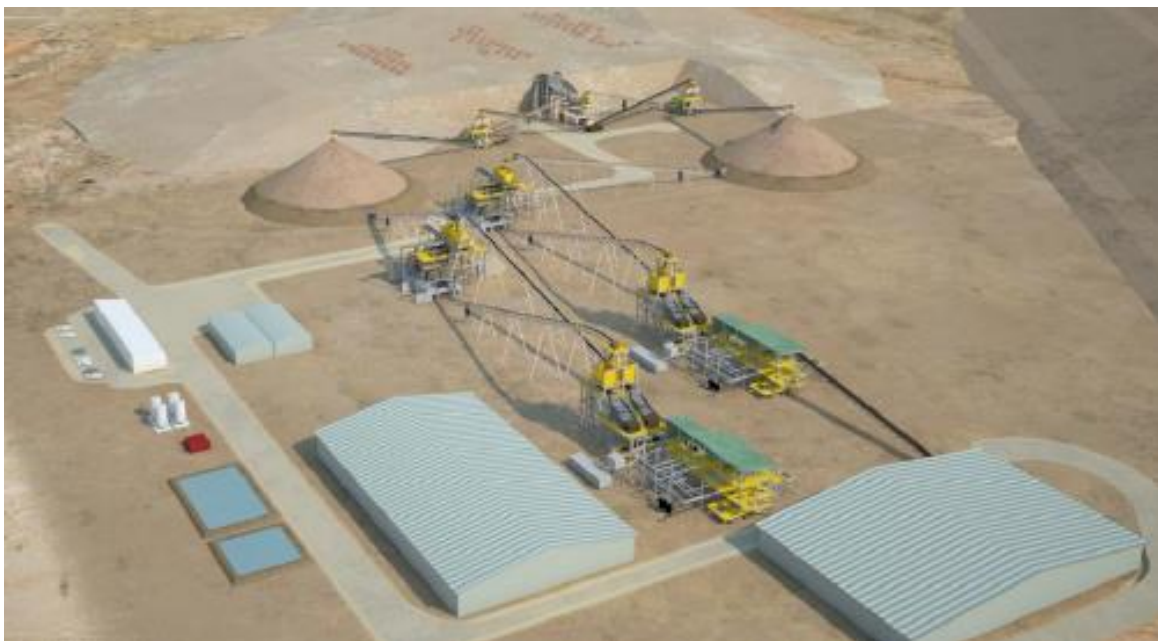
The PFS was based on the updated Ore Reserve for Pilgangoora of 69.8Mt grading 1.26% Li₂O (spodumene), 132ppm Ta₂O₅ and 1.04% Fe₂O₃ (see ASX Announcement – 22 August 2016).

PROCESSING

The process plant is designed to process 4Mtpa of ore feed. The nominal capacity of the process plant is 540tph of ore at a utilisation rate of 85%. As part of the DFS, to facilitate the expansion from 2Mtpa to 4Mtpa, the primary crushing circuit and crushed ore stockpile have been designed for 4Mtpa installed capacity. The current process plant layout has been designed to accommodate a later expansion.

For the purposes of the PFS, the flowsheet has been designed to target the following product streams:

- 6.0% Chemical Grade spodumene concentrate (SC6.0 specification);
- Low iron Technical Grade spodumene concentrate targeting SC7.0 specification, low-iron; and
- 30% Ta₂O₅ Tantalite Concentrate.



FINANCIAL EVALUATION

A summary of the key parameters and financial outcomes for the 4Mtpa Pre-Feasibility Study is provided below:

Table 1 – Summary of Key Parameters

Summary of Key Parameters from PFS Financial Model			
Metric	Unit	2Mtpa	4Mtpa
Life of Mine (LOM)	Years	36	19
LOM Ore Mined	Mt	69.8	69.8
LOM Waste Mined	Mt	284.3	284.3
LOM Strip Ratio	(waste:ore)	4.07	4.07
Plant Feed Rate	Mtpa	2.0	4.0
Average Lithium Head Grade	%	1.26	1.26
Average Lithium Recovery	%	77.5	77.5
Average Spodumene Concentrate Production	ktpa	314	564
Average Tantalite Production	k lbs pa	321	579
Average Realised Lithium Price	US\$/t CFR Real	537	539
Average Tantalite Forecast Price	US\$/lb FOB Real	73.0	66.2
Forecast FX Rate	AUD:USD	0.75	0.75
Initial Capital Costs ² (incl. 20% contingency for incremental capital)	A\$M	214	342
Ave LOM Cash Operating Cost ¹	A\$/t product Real	276 (US\$207)	240 (US\$180)
Ave LOM Operating Cost ¹ adj. for all royalty and native title costs	A\$/t product Real	344 (US\$258)	307 (US\$230)
Average Annual EBITDA (Real \$)	A\$M	121	245
NPV (10% Discount Rate, Post Tax)	A\$M	709	1,165
IRR	%	38.1	46.3
Payback	Years	~2.72	~3.05

1. Cash operating costs include all mining, processing, transport, port, shipping/freight, site based general and administration costs, and an allocation of corporate administration/overhead costs, are net of Ta₂O₅ by-product credits, but exclude state and private royalties and native title costs.
2. Pre production capital costs exclude capitalised pre-production operating costs estimated to be \$10M.

CAPITAL COST ESTIMATES

The incremental capital cost estimate to achieve a 4Mtpa plant and infrastructure capacity at the Pilgangoora site, including all direct and indirect costs, is approximately A\$128 million plus (± 20%) at a PFS level of assessment. This estimate includes a contingency of 20%.

The costs presented have been estimated to an overall accuracy of ± 20%, which is commensurate with the level of study undertaken.

The table below summarises the key components of the capital cost estimate:

Table 2 – Capital Costs Estimate

CAPITAL ITEM	BASE CASE	EXPANSION OPTION	SOURCE/COMMENTS
	2MTPA VALUE (\$M)	4MTPA VALUE (\$M)	
Process Plant and Infrastructure	\$171.3	\$99.0	Como Engineers – Includes Crushing, HPGR, HMS, Milling, Tantalum recovery and dressing, Fine Spodumene Flotation, Tailings, Product Drying, Storage, Camp, Roads, Power & Water services, Comms, Fuel services, & General Equipment.
Owners Costs	\$21.5	\$7.5	Includes Project Management Costs; Warehouse, Critical Spares, First Fill, etc.
Other Costs	\$2.8	\$0.2	
Contingency	\$18.3	\$21.1	Overall ave. of 15% of Plant, Infrastructure & Owners costs.
TOTAL	\$213.9	\$127.8	

OPERATING COST ESTIMATES

The LOM average cash operating costs after Tantalum credits for the 4Mtpa case is expected to approximate **US\$180/t concentrate CFR**, a US\$27/t cost reduction compared to the 2Mtpa cost of approximately USD\$207/t concentrate CFR, demonstrating the economies of scale that should be realised from a larger operation.

Project costs at these levels indicate that Pilgangoora will be one of the lowest cost hard rock lithium producers globally.

A breakdown of key cash operating cost components is provided in Table 3 below:

Table 3 – Cash Operating Costs Estimate Details on a A\$ cost per tonne of concentrate basis

Cost Item	Operating Costs (LOM ave) A\$/ tonne of Concentrate	
	2 Mtpa	4 Mtpa
Mining	115	97
Processing	154	137
Transport and Loading	48	47
G&A, and selling costs (incl corporate allocation)	35	24
Ocean Freight	24	26
Total Cash Operating Costs (before tantalite credit) CFR	376	331
Less: Tantalite Credit	(100)	(91)
Total Cash Operating Costs (after tantalite credit) CFR	276	240
Royalties (gov't and private royalty; native title)	68	67
Total Cash Operating Costs adj. for royalties and native title costs CFR	344	307

FINANCIAL ANALYSIS – SENSITIVITIES

As shown in Table 1 above, the 4Mtpa PFS for the Pilgangoora Project demonstrates robust financial outcomes with a post-tax NPV_{10%} of **AUD\$1,165M**, robust margins, a rapid payback (~3.1 yrs) and a strong IRR (46.3%).

The project is most sensitive to changes in the AUD price received for spodumene concentrate. Set out below are AUD NPV sensitivities demonstrating the impact of price and exchange rate changes:

Table 4– NPV Sensitivities

Price Scenario US\$/t CFR	400	500	Base Case	600	700
FX Rate					
0.65 Flat	1,006	1,436	1,569	1,867	2,298
0.70 Flat	829	1,229	1,352	1,629	2,029
0.75 Flat	676	1,049	1,165	1,423	1,796
0.80 Flat	542	892	1,000	1,242	1,592

More Information:

ABOUT PILBARA MINERALS

Pilbara Minerals (“Pilbara” – ASX: PLS) is a mining and exploration company listed on the ASX, specialising in the exploration and development of the specialty metals Lithium and Tantalum. Pilbara owns 100% of the world class Pilgangoora Lithium-Tantalite project which is the second largest Spodumene (Lithium Aluminium Silicate) project in the world. Pilgangoora is also one of the largest pegmatite hosted Tantalite resources in the world and Pilbara proposes to produce Tantalite as a by-product of its Lithium production.

ABOUT LITHIUM

Lithium is a soft silvery white metal which is highly reactive and does not occur in nature in its elemental form. It has the highest electrochemical potential of all metals, a key property in its role in Lithium-ion batteries. In nature it occurs as compounds within hard rock deposits and salt brines. Lithium and its chemical compounds have a wide range of industrial applications resulting in numerous chemical and technical uses. A key growth area is its use in lithium batteries as a power source for a wide range of applications including consumer electronics, power station-domestic-industrial storage, electric vehicles, power tools and almost every application where electricity is currently supplied by fossil fuels.

ABOUT TANTALUM

The Tantalum market is boutique in size with around 1,300 tonnes required each year. Its primary use is in capacitors for consumer electronics, particularly where long battery life and high performance is required such as smart phones, tablets and laptops.

Contacts:

Investors / Shareholders

Ken Brinsden
Managing Director and CEO

John Young
Technical Director

Alex Eastwood/Brian Lynn
General Counsel/CFO

Ph +61 (0)8 9336 6267

Ph +61 (0)8 9336 6267

Ph +61 (0) 9336 6267

Media Inquiries

Nicholas Read
Read Corporate
Ph +61 (0)8 9388 1474
Mb: +61 419 929 046

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Competent Person's Statement

The Company confirms it is not aware of any new information or data that materially affects the information included in the 11th of July , 2016 Pilgangoora Mineral Resource Estimate and that all material assumptions and technical parameters underpinning the estimate continue to apply and have not materially changed when referring to its resource announcement made on 11th of July 2016.

The Company confirms it is not aware of any new information or data that materially affects the information included in the 22nd of August , 2016 Pilgangoora Ore Reserve Estimate and that all material assumptions and technical parameters underpinning the estimate continue to apply and have not materially changed when referring to its resource announcement made on 22nd of August 2016.

Forward Looking Statement and Important Information

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.

Investors should make and rely upon their own enquiries before deciding to acquire or deal in the Company's securities.

This release does not constitute an offer to sell, or a solicitation of an offer to buy, securities in the United States or any other jurisdiction. Any securities described in this release have not been, and will not be, registered under the US Securities Act of 1933 and may not be offered or sold in the United States except in transactions exempt from, or not subject to, registration under the US Securities Act and applicable US state securities laws.