Archer Materials Limited (ACN: 123 993 233)
Lot Fourteen, Frome Road, Adelaide SA 5000
www.archerx.com.au

ASX Announcement (ASX: **AXE**) 17 January 2025

Q2 FY25 Activities Report and Appendix 4C

For the quarter ended 31 December 2024.

Key Highlights

- Launch of the TMR sensor project, where Archer will create bespoke sensors using its quantum expertise for industrial applications.
- Archer is about to commence work to optimise the TMR sensor design and engage with potential customers, potentially bringing forward revenue opportunities while it continues ^{12}CQ quantum development.
- Fabricated a smaller Biochip gFET design through its foundry partner, a reduction of 97%, to reduce cost and improve foundry readiness.
- Moved closer to feasibility stages and improved testing accuracy for the Biochip's detection of chronic kidney disease.
- Improved the control of the ^{12}CQ quantum project by creating new device architecture which achieved the "Coulomb Blockade" phenomenon at room temperature.
- Improved readout of the ^{12}CQ quantum project by extending the spin coherence lifetimes for both its carbon nanosphere material and novel manufacturable carbon films, along with bolstering the films' sample-to-sample reproducibility.
- Strong cash position to fund activities with $16.8 million and no debt, supported by a A$2.1 million cash rebate from the Australian Federal Government's Research and Development Tax Incentive program.

Archer Materials Limited ("Archer", the "Company", "ASX: AXE"), a semiconductor company advancing the quantum computing and medical diagnostics industries, provides its Quarterly Activities Report and Appendix 4C for the quarter ended 31 December 2024 ("Quarter").

Commenting on Q2 FY25 activities, Greg English, Executive Chairman of Archer, said

"Archer is continuing to develop the Biochip with a focus on the testing of chronic kidney disease of the Biochip, continued advancement with the ^{12}CQ quantum project, and the launch of a new technology vertical in quantum-based TMR sensors.

"Leveraging Archer's expertise in quantum mechanics, the Company will develop specialised TMR sensors for customers, which is expected to open a new part of the market for industrial applications and, potentially, an earlier revenue stream for Archer.

"We have successfully miniaturised the Biochip gFET to make it cheaper for customers and manufacturing, while preparing it for the foundry once developed. The Biochip team also improved the operation, processing, and design of the gFET sensors and moved it towards the

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feasibility stages of product development. This all helps bring the Biochip closer to the at-home testing of chronic kidney disease.

"We made considerable progress with the 12CQ project by building a new device architecture and fabrication process to observe key quantum electrical behaviour. This work helps move the team's research forward in terms of control and room temperature functionality.

"Archer has a solid runway to bring these technologies to market, with the people and balance sheet in place to support the growth."

Technology development and commercialisation activities

Quantum Technologies

^{12}CQ Quantum Project

During the quarter, Archer made progress on the ^{12}CQ project with respect to readout (reading the output of quantum information on a chip) and control (manipulating the input of quantum information on a chip).

In partnership with the Queen Mary University of London ("QMUL"), Archer's quantum team developed a new device architecture and fabrication process to observe key quantum electrical behaviour by making electrical contact with the Company's carbon nanosphere ("CNS") spin material. The device uses Archer' previously developed graphene electrodes technology .

The new device architecture achieved the "Coulomb Blockade" phenomenon at room temperature, which means the team was able to precisely control the number of electrons on a quantum dot. This helps move the team's research forward in terms of control and room temperature functionality. Archer is continuing to work with QMUL to test and optimise electrical properties and quantum behaviour of these new devices.

Archer is also working with its research partners at the École Polytechnique Fédérale de Lausanne ("EPFL") in Switzerland to accurately readout quantum coherence spin lifetimes of the Company's CNS materials. Using its pulsed electron spin resonance ("p-ESR") chip Archer was able to accurately readout the quantum coherence spin lifetime of its novel carbon film. It was recently announced that, under optimised synthesis conditions, spin coherence lifetime of the carbon film could be increased beyond 800 ns, while bolstering the films' sample-to-sample reproducibility.

TMR sensors

Archer announced it has begun developing tunnelling magnetoresistance (TMR) sensor technologies, opening an additional and potential earlier pathway to revenue opportunities. TMR sensors can detect very small changes in magnetic fields, by leveraging quantum phenomena, to provide a performance edge over incumbent technologies. This is an ideal technology for many industrial applications including artificial intelligence, data centres, automotive, and internet-of-things. Using the expertise of Archer's quantum team, it is working with potential customers to create bespoke TMR sensors based on its prototypes, manufactured by its foundry partner, MultiDimension Technology ("MDT") (image 1).

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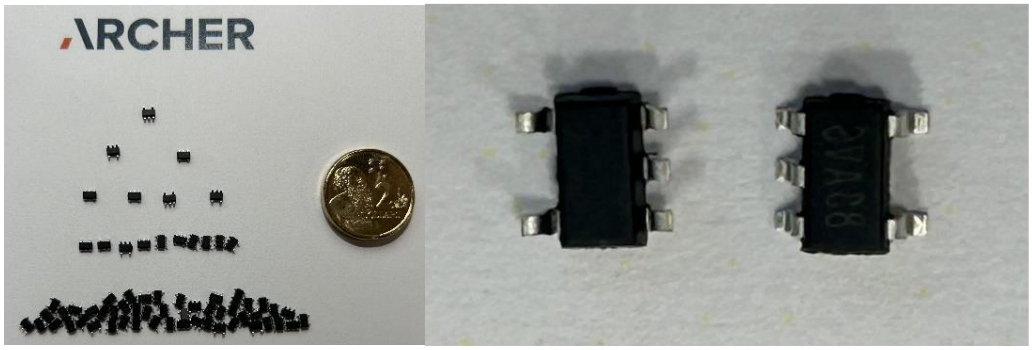

Image 1: Prototype TMR sensors received by Archer from MDT

Biochip

The Biochip team achieved a number of important milestones during the quarter including miniaturising the graphene field effect transistor ("gFET") design, along with moving closer to its feasibility ages and improving its testing accuracy.

Archer received a fabricated miniaturised version of its Biochip gFET design from its commercial foundry partner, Applied Nanolayers ("ANL"), with the whole four-inch wafer diced and assembled at the Company's outsourced semiconductor assembly and testing ("OSAT") partner, AOI Electronics. The design has been significantly reduced in size in comparison to the earlier designs of 10mm x 10mm to 1.5mm x 1.5mm (image 2), or by 97%. The whole four-inch wafer produced 1,375 gFET chips, compared to the 45 gFET chips produced using earlier designs of four-inch wafer fabrication runs. The assembled chips are currently undergoing testing at Archer. The smaller gFETs reduce the cost per chip and improve foundry readiness.

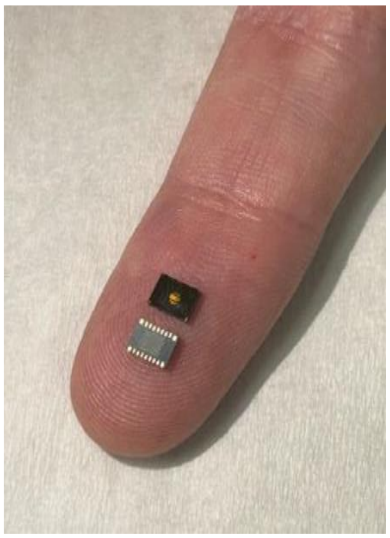

Image 2: Example of assembled miniaturised gFET (front side and back side), a 1.5mm x 1.5mm gFET chip is assembled inside

The Biochip team has also started testing the transition to feasibility stages of product development, along with making improvements in operation, processing, and design of the gFET sensors. Archer built a dataset of gFET performance for foundry batch-to-batch repeatability and investigated device stability across testing conditions and time periods. The data sets are key inputs to the feasibility development program for the Biochip gFET in the use

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of blood potassium testing for chronic kidney disease. The team achieved this by developing a first version electrical conditioning procedure that sets the individual gFETs to a condition of high test-to-test repeatability. The procedure resulted in an improvement of up to 10 times in sweeping voltage repeatability, which directly translates to better potassium measurement accuracy. This is critical to achieve the high accuracy measurements required for blood potassium levels in chronic kidney disease.

Financial and corporate update

The Company's cash balance at the end of the Quarter was $16,867,000 and has no debt. Archer's cash position was bolstered by the receipt of a A$2,189,556 cash rebate from the Australian Federal Government's Research and Development Tax Incentive program for the year ended 30 June 2024.

The Company holds 1,633,944 shares in Canadian Stock Exchange listed Volatus Capital Corp (CSE:VC) and 10,397,806 shares and 2,892,780 quoted options in ASX listed ChemX Materials Ltd (ASX:CMX).

Archer's accompanying Appendix 4C cashflow report for the Quarter includes an amount of $147,000 at item 6.1, relating to executive and non-executive director fees paid as salaries and wages.

The Board of Archer authorised this announcement to be given to ASX.

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About Archer

Archer is a technology company that operates within the semiconductor industry. The Company is developing advanced semiconductor devices, including chips relevant to quantum computing and medical diagnostics. Archer utilises its global partnerships to develop these technologies for potential deployment and use across multiple industries. www.archerx.com.au

Appendix 4C

Quarterly cash flow report for entities subject to Listing Rule 4.7B

Name of entity	
Archer Materials Limited	
ABN	**Quarter ended ("current quarter")**
64 123 993 233	31 December 2024

Consolidated statement of cash flows		**Current quarter $A'000**	**Year to date (6 months) $A'000**
1.	**Cash flows from operating activities**		
1.1	Receipts from customers	-	-
1.2	Payments for		
	(a) research and development (excludes wages allocated to R&D)	(685)	(1,336)
	(b) product manufacturing and operating costs	-	-
	(c) advertising and marketing	-	-
	(d) leased assets	(43)	(86)
	(e) staff costs	(746)	(1,980)
	(f) administration and corporate costs	(430)	(680)
1.3	Dividends received (see note 3)	-	-
1.4	Interest received	548	645
1.5	Interest and other costs of finance paid	-	-
1.6	Income taxes paid	-	-
1.7	Government grants and tax incentives	2,190	2,190
1.8	Other (provide details if material)		
1.9	**Net cash from / (used in) operating activities**	**834**	**(1,247)**

2.	**Cash flows from investing activities**		
2.1	Payments to acquire or for:		
	(a) entities	-	-
	(b) businesses	-	-
	(c) property, plant and equipment	(2)	(5)
	(d) investments		
	(e) intellectual property	(68)	(139)

Consolidated statement of cash flows		Current quarter $A'000	Year to date (6 months) $A'000
	(f) other non-current assets	-	-
2.2	Proceeds from disposal of:		
	(a) entities	-	-
	(b) businesses	-	-
	(c) property, plant and equipment	-	9
	(d) investments	39	39
	(e) intellectual property	-	-
	(f) other non-current assets	-	-
2.3	Cash flows from loans to other entities	-	-
2.4	Dividends received (see note 3)	-	-
2.5	Other (provide details if material)	-	-
2.6	**Net cash from / (used in) investing activities**	**(31)**	**(96)**

3.	**Cash flows from financing activities**		
3.1	Proceeds from issues of equity securities (excluding convertible debt securities)	-	-
3.2	Proceeds from issue of convertible debt securities	-	-
3.3	Proceeds from exercise of options	-	-
3.4	Transaction costs related to issues of equity securities or convertible debt securities	-	-
3.5	Proceeds from borrowings	-	-
3.6	Repayment of borrowings	-	-
3.7	Transaction costs related to loans and borrowings	-	-
3.8	Dividends paid	-	-
3.9	Other (provide details if material)	-	-
3.10	**Net cash from / (used in) financing activities**	**-**	**-**

4.	**Net increase / (decrease) in cash and cash equivalents for the period**		
4.1	Cash and cash equivalents at beginning of period	16,064	18,210
4.2	Net cash from / (used in) operating activities (item 1.9 above)	834	(1,247)
4.3	Net cash from / (used in) investing activities (item 2.6 above)	(31)	(96)

Consolidated statement of cash flows		Current quarter $A'000	Year to date (6 months) $A'000
4.4	Net cash from / (used in) financing activities (item 3.10 above)	-	-
4.5	Effect of movement in exchange rates on cash held	-	-
4.6	**Cash and cash equivalents at end of period**	**16,867**	**16,867**

5.	Reconciliation of cash and cash equivalents at the end of the quarter (as shown in the consolidated statement of cash flows) to the related items in the accounts	Current quarter $A'000	Previous quarter $A'000
5.1	Bank balances	784	3,981
5.2	Call deposits	16,083	12,083
5.3	Bank overdrafts	-	-
5.4	Other (provide details)	-	-
5.5	**Cash and cash equivalents at end of quarter (should equal item 4.6 above)**	**16,867**	**16,064**

6.	Payments to related parties of the entity and their associates	Current quarter $A'000
6.1	Aggregate amount of payments to related parties and their associates included in item 1 * The above payments relate to fees and salaries paid to Directors during the quarter.	147
6.2	Aggregate amount of payments to related parties and their associates included in item 2	-

Note: if any amounts are shown in items 6.1 or 6.2, your quarterly activity report must include a description of, and an explanation for, such payments.

7.	**Financing facilities** *Note: the term "facility' includes all forms of financing arrangements available to the entity.* *Add notes as necessary for an understanding of the sources of finance available to the entity.*	**Total facility amount at quarter end $A'000**	**Amount drawn at quarter end $A'000**
7.1	Loan facilities	-	-
7.2	Credit standby arrangements	-	-
7.3	Other (please specify)	-	-
7.4	**Total financing facilities**	**-**	**-**

7.5	**Unused financing facilities available at quarter end**	n/a

7.6 Include in the box below a description of each facility above, including the lender, interest rate, maturity date and whether it is secured or unsecured. If any additional financing facilities have been entered into or are proposed to be entered into after quarter end, include a note providing details of those facilities as well.

n/a

8.	**Estimated cash available for future operating activities**	**$A'000**
8.1	Net cash from / (used in) operating activities (item 1.9)	825
8.2	Cash and cash equivalents at quarter end (item 4.6)	16,867
8.3	Unused finance facilities available at quarter end (item 7.5)	-
8.4	Total available funding (item 8.2 + item 8.3)	16,867
8.5	**Estimated quarters of funding available (item 8.4 divided by item 8.1)**	N/A

Note: if the entity has reported positive net operating cash flows in item 1.9, answer item 8.5 as "N/A". Otherwise, a figure for the estimated quarters of funding available must be included in item 8.5.

8.6 If item 8.5 is less than 2 quarters, please provide answers to the following questions:

8.6.1 Does the entity expect that it will continue to have the current level of net operating cash flows for the time being and, if not, why not?

Answer: n/a

8.6.2 Has the entity taken any steps, or does it propose to take any steps, to raise further cash to fund its operations and, if so, what are those steps and how likely does it believe that they will be successful?

Answer: n/a

8.6.3 Does the entity expect to be able to continue its operations and to meet its business objectives and, if so, on what basis?

Answer: n/a

Note: where item 8.5 is less than 2 quarters, all of questions 8.6.1, 8.6.2 and 8.6.3 above must be answered.

Compliance statement

1 This statement has been prepared in accordance with accounting standards and policies which comply with Listing Rule 19.11A.

2 This statement gives a true and fair view of the matters disclosed.

Date: ..... 17 January 2025.....

Authorised by: ..... By the Board.....
(Name of body or officer authorising release – see note 4)

Notes

1. This quarterly cash flow report and the accompanying activity report provide a basis for informing the market about the entity's activities for the past quarter, how they have been financed and the effect this has had on its cash position. An entity that wishes to disclose additional information over and above the minimum required under the Listing Rules is encouraged to do so.

2. If this quarterly cash flow report has been prepared in accordance with Australian Accounting Standards, the definitions in, and provisions of, *AASB 107: Statement of Cash Flows* apply to this report. If this quarterly cash flow report has been prepared in accordance with other accounting standards agreed by ASX pursuant to Listing Rule 19.11A, the corresponding equivalent standard applies to this report.

3. Dividends received may be classified either as cash flows from operating activities or cash flows from investing activities, depending on the accounting policy of the entity.

4. If this report has been authorised for release to the market by your board of directors, you can insert here: "By the board". If it has been authorised for release to the market by a committee of your board of directors, you can insert here: "By the [*name of board committee – eg Audit and Risk Committee*]". If it has been authorised for release to the market by a disclosure committee, you can insert here: "By the Disclosure Committee".

5. If this report has been authorised for release to the market by your board of directors and you wish to hold yourself out as complying with recommendation 4.2 of the ASX Corporate Governance Council's *Corporate Governance Principles and Recommendations*, the board should have received a declaration from its CEO and CFO that, in their opinion, the financial records of the entity have been properly maintained, that this report complies with the appropriate accounting standards and gives a true and fair view of the cash flows of the entity, and that their opinion has been formed on the basis of a sound system of risk management and internal control which is operating effectively.