

## December 2024 Quarterly Activities Report

### HIGHLIGHTS

#### Sparc Hydrogen

- Sparc announced a formal commitment from the JV partners to proceed to Stage 2 of the Sparc Hydrogen joint venture, subsequent to quarter end
- Sparc Hydrogen secured the first patent for its PWS reactor technology in Morocco with 17 jurisdictions pending review
- Front-end engineering and design for Sparc Hydrogen's first-of-its-kind pilot plant completed, with construction due to commence early in 2025

#### Graphene Based Additives

- Field trial of **ecosparc®** enhanced coating commenced with Santos at Port Bonython
- Trial results will assess whether **ecosparc®** enhanced coatings can be added to Santos' coatings specification for potential commercial use
- Additional field trials are progressing with the South Australian Department of Infrastructure & Transport and 29Metals Limited
- Significant corrosion improvements have been demonstrated by incorporating graphene in water-based epoxy coatings building upon Sparc's leading dataset in solvent-based coatings
- Continued R&D and customer discussions held in relation to collaborative projects in anti-fouling and plastics

#### Corporate

- Cash balance of A\$2.02M as at 31 December 2024
- Sparc Technologies received a A\$1.12M R&D tax rebate during the quarter
- Simon Kidston, founder of Genex Power Ltd, appointed as Non-Executive Director

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**Sparc Technologies Limited** (ASX: SPN) (**Sparc** or the **Company**) is pleased to provide its December 2024 Quarterly Activities Report.



## Sparc Hydrogen

Subsequent to quarter end, Sparc Hydrogen – a joint venture between Sparc Technologies, the University of Adelaide and Fortescue – announced its commitment to proceeding with Stage 2 of the joint venture. This decision reflects several key milestones achieved over recent months and strongly endorses Sparc Hydrogen's potential to unlock low-cost green hydrogen via photocatalytic water splitting (**PWS**).

Stage 2 activities are focused on pilot plant construction and reactor testing along with ongoing laboratory testing of PWS reactors under a range of conditions. Sparc Hydrogen believes that the pilot plant will be a globally leading facility for R&D and commercialisation of PWS, reinforcing Sparc Hydrogen's first-mover position in this emerging direct solar to hydrogen technology. Based on the current schedule provided by the engineering consultants (Incitias Pty Ltd), pilot plant construction is expected to be completed by mid-2025. Once built, the pilot plant will enable Sparc Hydrogen to test different reactor designs and photocatalyst materials. Sparc Hydrogen is not aware of any similar facilities for testing and scale up of photocatalytic water splitting under concentrated solar conditions worldwide.

Activities related to the pilot plant undertaken during the quarter included:

- Completion of front-end engineering and design (**FEED**) validating the technical feasibility of the project including a Class 3 AACE<sup>1</sup> project budget and timeline.
- Submission of site planning reports to the Light Regional Council.
- Procurement of long-lead equipment for the pilot plant including the linear Fresnel (**LFR**) concentrated solar system commenced with delivery expected late Q1 2025.
- Finalised design of pilot scale PWS reactors with drawings submitted to manufacturing contractors for review.
- Submission of grant application via Australia's Economic Accelerator Innovate program.
- In principle agreement for the supply of photocatalyst materials for the pilot plant from Shinshu University.
- Lease agreement negotiated between Sparc Hydrogen and the University of Adelaide for the Roseworthy site.



Figure 1: 3D pilot plant model based on FEED study

<sup>1</sup> Class 3 AACE capital cost estimate reflects a level of project definition of 10% - 40% and expected accuracy range of low: (10%) – (20%) and high: 10% – 30%.

The key objectives of the pilot plant include:

- Advancing Sparc Hydrogen reactor technology from TRL-5 to at least TRL-6<sup>2</sup> via semi-continuous operation of an 'on-sun' pilot plant using concentrated solar mirrors.
- Real world demonstration of a concentrated solar field integrated with photocatalytic water splitting for green hydrogen production.
- Providing an R&D tool for on-sun testing of Sparc Hydrogen's PWS reactors, alternate photocatalysts and balance of plant.
- Benchmarking photocatalyst performance and durability under concentrated solar conditions against laboratory testing.
- Verifying detailed optical, thermal and production modelling.
- Understanding design and engineering issues to guide further scale up.
- Evaluating the operability of key equipment.
- Establishing safety protocols and operating procedures.
- Guiding further patenting opportunities.
- Showcasing technology to new and existing stakeholders and funding bodies.
- Engagement with key equipment suppliers.
- Solidifying Sparc Hydrogen's leading position in the development of concentrated solar based PWS reactors with ability to test under real world conditions.

Laboratory-based testing and optimisation of Sparc Hydrogen's photocatalytic water splitting reactors continued during the quarter under a range of conditions and photocatalyst materials.

Sparc Hydrogen continues to differentiate its utilisation of PWS technology, setting it apart from conventional methods (electrolysis) for the production of green hydrogen. Sparc Hydrogen's novel approach to PWS was validated by securing the first patent grant for the technology in Morocco in January 2025. The granted patent claims are directed at a photocatalytic apparatus designed for efficient hydrogen production and secures enforceable intellectual property rights underpinning Sparc Hydrogen's unique approach to PWS. The granted claims protect key innovations in Sparc Hydrogen's solar reactor design, which improve photocatalytic water splitting efficiencies by leveraging the entire solar spectrum. By incorporating concentrated solar radiation, the apparatus increases reaction rates and reduces the quantity of photocatalyst material required, offering the potential for a scalable, sustainable, and cost-effective alternative to conventional green hydrogen production methods. This patent underscores the strength of Sparc Hydrogen's intellectual property portfolio, with applications in 17 other jurisdictions currently under or pending review.

PWS does not rely on renewable electricity sources such as solar or wind farms, nor expensive electrolyzers, to produce hydrogen from water. This directly addresses a fundamental challenge in the nascent green hydrogen industry - the cost of electricity. Sparc Hydrogen's pioneering technology employs a photocatalyst material and sunlight to produce green hydrogen directly from water. Hydrogen produced from PWS can serve as a clean fuel or feedstock to support the decarbonisation of hard-to-abate industries. Key advantages over electrolysis include:

- Photocatalysis does not use electricity to produce hydrogen from water thereby decoupling green hydrogen and energy costs.
- The simplicity of PWS being a direct solar to hydrogen production system drives potential for very low costs.
- Sunlight is the only energy input driving the process delivering emissions free hydrogen.
- Sparc Hydrogen utilises concentrated solar infrastructure which is inherently flexible and scalable.

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<sup>2</sup> ARENA, Technology Readiness Levels for Renewable Energy Sectors, Commonwealth of Australia (Australian Renewable Energy Agency) 2014



- PWS has a comparative advantage over electrolysis in off-grid and remote locations.

The decision to proceed to Stage 2 of the joint venture is being made under the terms and conditions of the subscription agreement entered into between MIH2 Pty Ltd (a subsidiary of Fortescue), The University of Adelaide, Innovation and Commercial Partners Pty Ltd as trustee for The Adelaide Research & Innovation Investment Trust, Sparc Technologies Limited and Sparc Hydrogen Pty Ltd, dated 31 January 2022 (**Subscription Agreement**). According to the terms of the Subscription Agreement, MIH2 Pty Ltd and Sparc Technologies Limited must contribute A\$2.5 million to Sparc Hydrogen following a positive decision to move forward with Stage 2 as described by the announcement on 7 January 2025. The parties' respective funding obligations and participating interests during Stage 2 are set out below:

	University of Adelaide	Sparc Technologies	Fortescue
<b>Sparc Hydrogen Joint Venture</b>			
<b>Stage 1</b>	IP contribution	Pays \$0.45m and issues 3m SPN shares	Pays \$1.80m
<b>Stage 1 Ownership</b>	<b>28%</b>	<b>52%</b>	<b>20%</b>
<b>Stage 2</b>	Remains the same	Pays \$1.025m	Pays \$1.475m
<b>Stage 2 Ownership</b>	<b>28%</b>	<b>36%</b>	<b>36%</b>

Table 1: Sparc Hydrogen funding and ownership structure

## Graphene Based Additives

### Anti-corrosive Coatings: **ecosparc**®

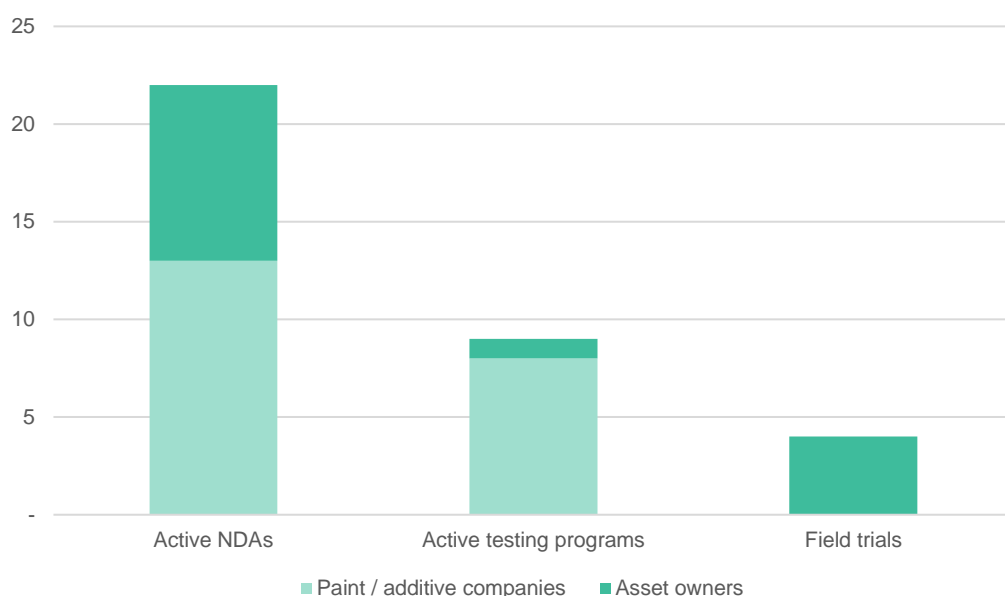
During the quarter, Sparc announced a field trial with Santos for the testing of **ecosparc**® enhanced coatings at Port Bonython in South Australia. This is the third significant counterparty to engage in field trials with Sparc and underlines the strong market appetite from asset owners for better performing anti-corrosive coatings. Importantly, the results of the field trial will be used to assess **ecosparc**® enhanced coatings for inclusion on Santos' coatings specification enabling their use by Santos on commercial projects. Field trials with the South Australian Department of Infrastructure and Transport (DIT) and 29Metals Limited progressed during the quarter. Initial 6-month inspections at both Streaky Bay and Golden Grove are expected to occur in late Q1 / early Q2 2025.

Sparc has field trials underway with end users of significant scale across a number of operational environments. The main purpose of the field trials is as follows:

- Derisking **ecosparc**® enhanced coatings for commercial use.
- Demonstrating market interest for better performing anticorrosive coatings from significant asset owners.
- Facilitating inclusion of **ecosparc**® enhanced coatings on asset owner specifications.

Sparc continues its dual-track approach to develop the market for the **ecosparc**® graphene based additive in protective coatings, targeting both major coatings companies and large asset owners. During the quarter, Sparc successfully engaged with two additional major global protective coatings companies. Sparc is now engaging with five of the eight largest global protective coatings companies. Sparc sees the uptick in engagement as evidence that graphene is gaining traction in the protective coatings industry and validation that Sparc is seen as a leader in this emerging area due to its experience and extensive data.





**Figure 2: Customer engagement status as at Dec-24 for ecosparc® targeting the US\$43 billion<sup>3</sup> global anti-corrosive coatings market**

Sparc's value proposition for the use of **ecosparc®** by the protective coatings industry is compelling, as summarised below.

<b>Industry relevant data</b>	Sparc Technologies has compiled >10,000 datapoints over the past 6 years to relevant ISO standards, repeatedly demonstrating the effectiveness and reliability of <b>ecosparc®</b> to improve the anti-corrosive performance of industry standard epoxy-based protective coatings.
<b>Graphene selection</b>	Graphene has 18 different properties which makes characterisation and selection critical for end-use performance. Sparc Technologies has reviewed and tested >100 grades of graphene and only a handful are qualified for use in <b>ecosparc®</b> .
<b>Method of action</b>	Sparc is the only company globally to conclusively demonstrate how graphene is acting to improve the strength and flexibility of epoxy-based materials, via a 'shock-absorber' principle.
<b>Shelf life / stability</b>	Creating a stable dispersion of graphene in a coating polymer matrix has been a significant challenge in this area of research. <b>ecosparc®</b> has shown shelf life stability for >2 years.
<b>Manufacturing</b>	Sparc has a commercial additive manufacturing facility in Adelaide.
<b>Ease of adoption</b>	Sparc has developed <b>ecosparc®</b> so that it can be incorporated at the point of paint manufacture without any change to existing processes.
<b>Field trials</b>	Real-world trials on steel infrastructure commenced in mid-2024 with results expected in 2025.
<b>Commercial applicability</b>	Sparc Technologies has modelled a return on investment (ROI) of 46x for asset owners through the use of <b>ecosparc®</b> enhanced coatings via reduced maintenance events.

**Table 2: Value proposition for ecosparc®**

As an extension to our data in solvent-based epoxy coatings, during the quarter Sparc announced significant improvements in anti-corrosion performance in water-based coating by incorporating graphene. The results from the internally formulated coatings were subsequently validated by the testing of a commercially available water-based coating which also showed significant performance improvement with graphene addition. Water-based coatings are gaining increasing interest as a more sustainable alternative to solvent-based coatings,

<sup>3</sup> Estimate of the global anti-corrosion coating market by 2029. Sourced from Exactitude Consultancy <https://exactitudeconsultancy.com/reports/3960/anti-corrosion-coatings-market/>



though they typically underperform in anti-corrosion. With tightening regulations on VOC content and both industry and individual consumers seeking more environmentally friendly alternatives, there is an increasing push to develop higher performing water-based products. The global water-based epoxy market was valued at US\$1.6 billion in 2022 and is projected to reach US\$2.9 billion by 2029, at a CAGR of 8.9% during the forecast period<sup>4</sup>. In comparison, the global market for anticorrosion coatings is estimated at US\$43 billion by 2029. Sparc is discussing the positive initial results with coatings and resin companies targeting co-development opportunities.

In addition to our core projects in protective coatings, Sparc continue to progress work in adjacent technology areas that leverage our skills, particularly in the sourcing, characterisation, and dispersion of graphene in coatings and polymers. Strong R&D progress has been made in the areas of graphene-enhanced plastics and in antifouling through our **biosparc™** technology platform.

## Corporate

### Appointment of Non-executive Director

During the quarter, Sparc strengthened its Board through the appointment of Mr Simon Kidston as Non-Executive Director. Mr Kidston is a highly experienced company director and former investment banker with over 30 years experience. He was the founding Director of Genex Power Limited (ASX: GNX), which was acquired by J-Power in July 2024 for an enterprise value exceeding A\$1 billion.

### Cash

As at 31 December 2024, the Company had a reported cash position of A\$2.02M. This includes a ~A\$1.12M rebate from its FY24 R&D tax incentive claim received in November 2024.

Cash expenditure for the quarter was in line with expectations and without any material movements from the previous quarter.

### Related Party Payments

In line with its obligations under ASX Listing Rule 5.3.5, Sparc Technologies Limited notes that the only payments to related parties of the Company, as advised in Appendix 4C for the period ended 31 December 2024, pertain to payments to directors for reimbursement of arrears of Directors Fees, salary and superannuation in the amount of A\$133K.

**-ENDS-**

**Authorised for release by:** Nick O'Loughlin, Managing Director.

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<sup>4</sup> Sourced from 24ChemicalResearch, <https://www.24chemicalresearch.com/reports/202538/global-waterborne-epoxy-coating-market-2023-2029-411>



## For more information:

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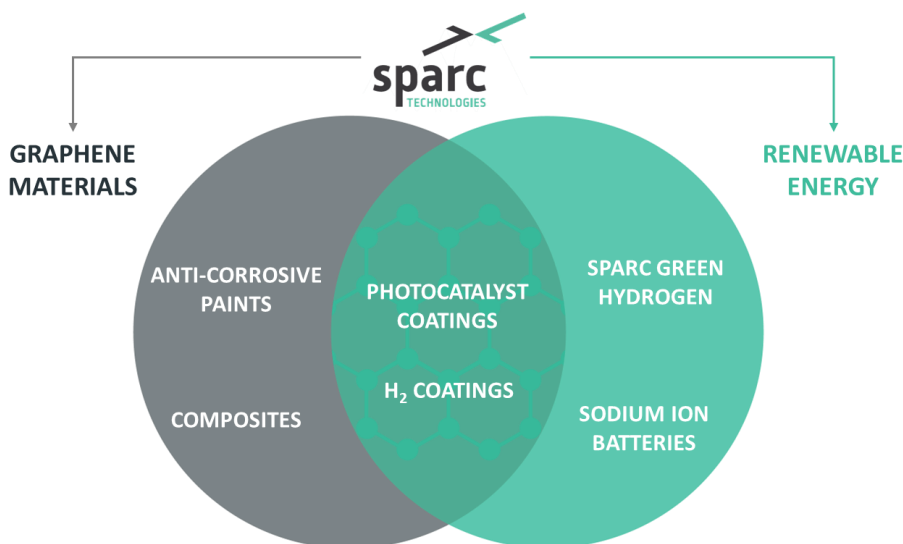
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## About Sparc Technologies



Sparc Technologies Limited ('Sparc', ASX: SPN) is an Australian company pioneering new technologies to disrupt and transform industry while seeking to deliver a more sustainable world. Sparc has established offices in Australia, Europe and North America and is focused on three core areas of technology development.

1. Sparc is the majority shareholder of **Sparc Hydrogen** which is a company pioneering the development of a **photocatalytic water splitting** (PWS) green hydrogen production technology. PWS is an alternative to producing green hydrogen via electrolysis, using only sunlight, water and a photocatalyst. Given lower infrastructure requirements and energy use, the process has the potential to deliver a cost and flexibility advantage over electrolysis.
2. Sparc has spent over 6 years developing a **graphene based additive** product, **ecosparc®**, which has demonstrated >40% anti-corrosion improvement in commercially available epoxy-based coatings. Sparc recently commissioned a manufacturing facility to produce **ecosparc®** and is engaging with global coatings companies and asset owners to conduct field trials.
3. Sparc is also developing sustainable **sodium ion battery anode technology** utilising agricultural bio-waste materials.

For more information please visit: [sparctechnologies.com.au](http://sparctechnologies.com.au)

For more information about **ecosparc®** please visit: [ecosparc.com.au](http://ecosparc.com.au)

For more information about Sparc Hydrogen please visit: [sparchydrogen.com](http://sparchydrogen.com)





## Forward Looking Statements

Some information included in this release constitutes forward-looking statements. Forward-looking statements are statements that are not historical facts and are generally, but not always, identified by words such as the following: expects, plans, anticipates, forecasts, believes, intends, estimates, projects, assumes, potential and similar expressions. Forward-looking statements also include reference to events or conditions that will, would, may, could or should occur.

These forward-looking statements are necessarily based upon a number of estimates and assumptions that, while considered reasonable at the time they are made, are inherently subject to a variety of risks and uncertainties which could cause actual events or results to differ materially from those reflected in the forward-looking statements, including, without limitation the matters set out in this announcement.

Although the Company attempts and has attempted to identify factors that would cause actual actions, events or results to differ materially from those disclosed in forward looking statements, there may be other factors that could cause actual results, performance, achievements or events not to be as anticipated, estimated or intended, and many events are beyond the reasonable control of the Company. Accordingly, readers are cautioned not to place undue reliance on forward looking statements. Forward looking statements in these materials speak only at the date of issue. Subject to any continuing obligations under applicable law or any relevant stock exchange listing rules, in providing this information the Company does not undertake any obligation to publicly update or revise any of the forward-looking statements or to advise of any change in events, conditions or circumstances on which any such statement is based.





## Appendix 4C

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

#### Name of entity

Sparc Technologies Limited

#### ABN

13 009 092 068

#### Quarter ended ("current quarter")

31 December 2024

Consolidated statement of cash flows	Current quarter \$A'000	Year to date (6 months) \$A'000
<b>1. Cash flows from operating activities</b>		
1.1 Receipts from customers	0	0
1.2 Payments for		
research and development	(330)	(783)
product manufacturing and operating costs	(0)	(0)
advertising and marketing	(21)	(46)
leased assets	0	0
staff costs	(199)	(386)
administration and corporate costs	(208)	(420)
1.3 Dividends received (see note 3)	0	0
1.4 Interest received	23	48
1.5 Interest and other costs of finance paid	0	0
1.6 Income taxes paid	0	0
1.7 Government grants and tax incentives	1,116	1,116
1.8 Other (provide details if material)	0	0
<b>1.9 Net cash from / (used in) operating activities</b>	<b>381</b>	<b>(471)</b>

<b>2. Cash flows from investing activities</b>		
2.1 Payments to acquire or for:		
entities	0	0
businesses	0	0
property, plant and equipment	(2)	(26)
investments	(187)	(187)
intellectual property	0	(2)
other non-current assets	0	0



Consolidated statement of cash flows		Current quarter \$A'000	Year to date (6 months) \$A'000
2.2	Proceeds from disposal of:		
	entities	0	0
	businesses	0	0
	property, plant and equipment	0	0
	investments	0	0
	intellectual property	0	0
	other non-current assets	0	0
2.3	Cash flows from loans to other entities	0	0
2.4	Dividends received (see note 3)	0	0
2.5	Other (provide details if material)	0	0
<b>2.6</b>	<b>Net cash from / (used in) investing activities</b>	<b>(189)</b>	<b>(215)</b>

<b>3.</b>	<b>Cash flows from financing activities</b>		
3.1	Proceeds from issues of equity securities (excluding convertible debt securities)	0	0
3.2	Proceeds from issue of convertible debt securities	0	0
3.3	Proceeds from exercise of options	0	0
3.4	Transaction costs related to issues of equity securities or convertible debt securities	0	0
3.5	Proceeds from borrowings	0	0
3.6	Repayment of borrowings	0	0
3.7	Transaction costs related to loans and borrowings	0	0
3.8	Dividends paid	0	0
3.9	Other (provide details if material)	0	0
<b>3.10</b>	<b>Net cash from / (used in) financing activities</b>	<b>0</b>	<b>0</b>

<b>4.</b>	<b>Net increase / (decrease) in cash and cash equivalents for the period</b>		
4.1	Cash and cash equivalents at beginning of period	1,830	2,707
4.2	Net cash from / (used in) operating activities (item 1.9 above)	381	(471)
4.3	Net cash from / (used in) investing activities (item 2.6 above)	(189)	(215)
4.4	Net cash from / (used in) financing activities (item 3.10 above)	0	0



Consolidated statement of cash flows		Current quarter \$A'000	Year to date (6 months) \$A'000
4.5	Effect of movement in exchange rates on cash held		
4.6	<b>Cash and cash equivalents at end of period</b>	<b>2,022</b>	<b>2,022</b>

5.	<b>Reconciliation of cash and cash equivalents</b> 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	2,022	1,830
5.2	Call deposits		
5.3	Bank overdrafts		
5.4	Other (provide details)		
5.5	<b>Cash and cash equivalents at end of quarter (should equal item 4.6 above)</b>	<b>2,022</b>	<b>1,830</b>

6.	<b>Payments to related parties of the entity and their associates</b>	Current quarter \$A'000
6.1	Aggregate amount of payments to related parties and their associates included in item 1	133
6.2	Aggregate amount of payments to related parties and their associates included in item 2	
<i>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.</i>		

7.	<b>Financing facilities</b> <i>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.</i>	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	<b>Total financing facilities</b>	<b>0</b>	<b>0</b>
7.5	<b>Unused financing facilities available at quarter end</b>		<b>0</b>
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.		



8.	Estimated cash available for future operating activities	\$A'000
8.1	Net cash from / (used in) operating activities (item 1.9)	381
8.2	Cash and cash equivalents at quarter end (item 4.6)	2,022
8.3	Unused finance facilities available at quarter end (item 7.5)	0
8.4	Total available funding (item 8.2 + item 8.3)	2,022
8.5	<b>Estimated quarters of funding available (item 8.4 divided by item 8.1)</b>	5.31

*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:

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:

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:

*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: .....24 January 2025.....

Authorised 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.

