

## Quarterly Update – 1 January to 31 March 2020

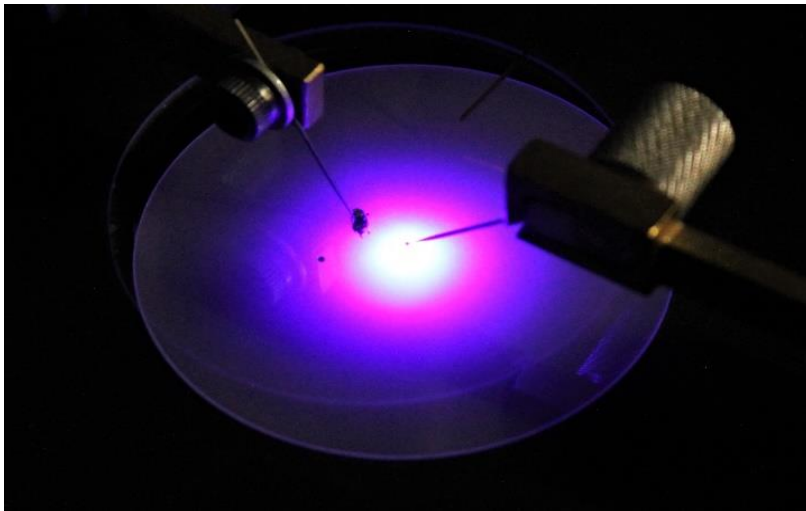
- Laser Diode business progress
  - Engaged Laser Diode customers to develop test products for delivery end of CY2020.
    - repeat customer revenues anticipated to commence early CY2021
  - RPCVD tunnel junction laser diode structures show promising performance potential
  - BluGlass' US test facility nears completion
- Completion of a \$5.8M Rights Issue and Shortfall placement
- RPCVD Tunnel Junction Paper for Laser Diode Applications presented at Photonics West
- Cost reduction measures announced for the remaining FY2020

Australian semiconductor developer, BluGlass Limited (ASX: BLG), is pleased to provide this Quarterly Update to accompany the Appendix 4C Quarterly Report for the three months ended 31 March 2020.

### Laser Diode Development Progress

BluGlass' Laser Diode business continues to advance in line with the published development roadmap in the March 2020 presentation: "Path to Commercial Revenues" which is available to download here:

<https://www.bluglass.com.au/investor-presentations>



*BluGlass EL quick test of standard laser diode structure*

During the quarter, BluGlass engaged with several prospective Laser Diode customers to develop bespoke laser diode structures for a range of end-product applications from industrial cutting and welding to biomedical devices.

BluGlass is working to verify various customer product designs through modelling and simulation testing. These design improvements are now being implemented in laser diode growth and device testing with the aim of delivering laser diode products to customers for testing by the end of this calendar year.

The successful initial device structures confirm the viability of these RPCVD-grown n-type layers for tunnel junction laser diode applications. Further work is ongoing in the development of the laser diode tunnel junction layers.

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## Supply chain development and Laser Diode test facilities

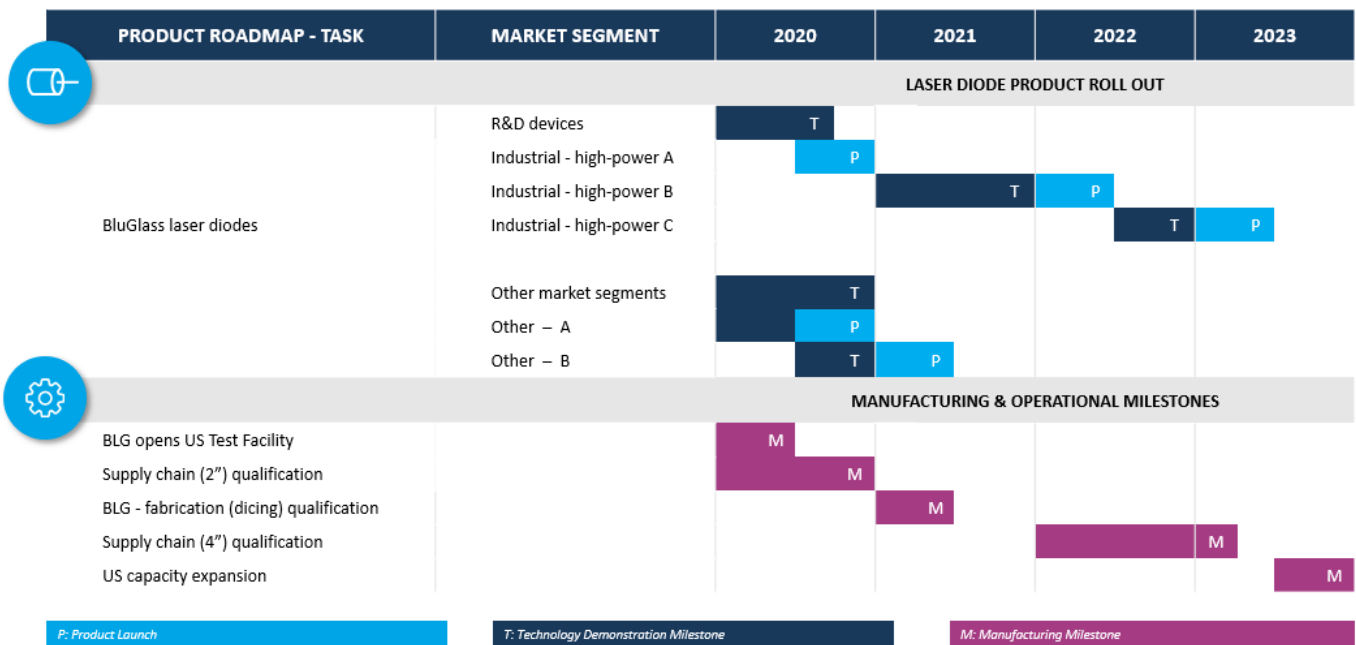
BluGlass continues to develop the global supply chain for the laser diode products by working with and qualifying multiple suppliers.

Several of our US fabrication suppliers have been temporarily closed or operating on reduced capacity due to the current issues surrounding COVID-19 lock-downs, however a primary supplier remains fully operational. To date there has been only minor disruption to BluGlass' critical product development activities. In preparation for potential impacts, discussions are underway with several backup suppliers.

The BluGlass US based test facility remains on track for completion and full operation in June 2020.

The facility will provide BluGlass with the flexibility to test laser diode chip, bar and packaged devices across a variety of products. The capabilities enable initial R&D testing during product development but will ultimately enable fully automated testing of commercial volumes of the LD products.

## BluGlass Laser Diode Product Development Roadmap



The Laser Diode product development roadmap remains on-track to deliver repeat customer revenues anticipated to commence early CY2021.

**BluGlass exhibited and presented new paper on RPCVD Tunnel Junctions for Laser Diodes at SPIE Photonics West 2020**



In February this year, BluGlass presented its latest RPCVD results in a new laser diode paper at the 2020 SPIE Photonics West Conference, San Francisco, USA.

The paper received industry interest, and a feature article was published in Compound Semiconductor magazine in March. The feature is available to download here:

<https://data.angel.digital/pdf/Compound%20Semiconductor%20Issue%20%20March%202020.pdf>

**Independent expert report**

During the quarter, BluGlass engaged independent expert, Dr Dominique Morrison (BSc(Hons) MSc PhD), to provide a comprehensive expert analysis of the RPCVD technology and evaluate each of the company's core markets.

The report provides:

- an analysis of the benefits of BluGlass' key technologies and IP assets
- a benefit comparison of RPCVD, relative to the incumbent MOCVD technology (advantages and disadvantages) for each of the identified applications
- potential barriers to commercialisation
- key LED and Laser Diode players
- an assessment of the deliverability and manufacturability of the technology and summarises the current status
- what is needed for effective deployment into the end markets

The report is available to download here: [www.bluglass.com.au/analyst-reports](http://www.bluglass.com.au/analyst-reports)

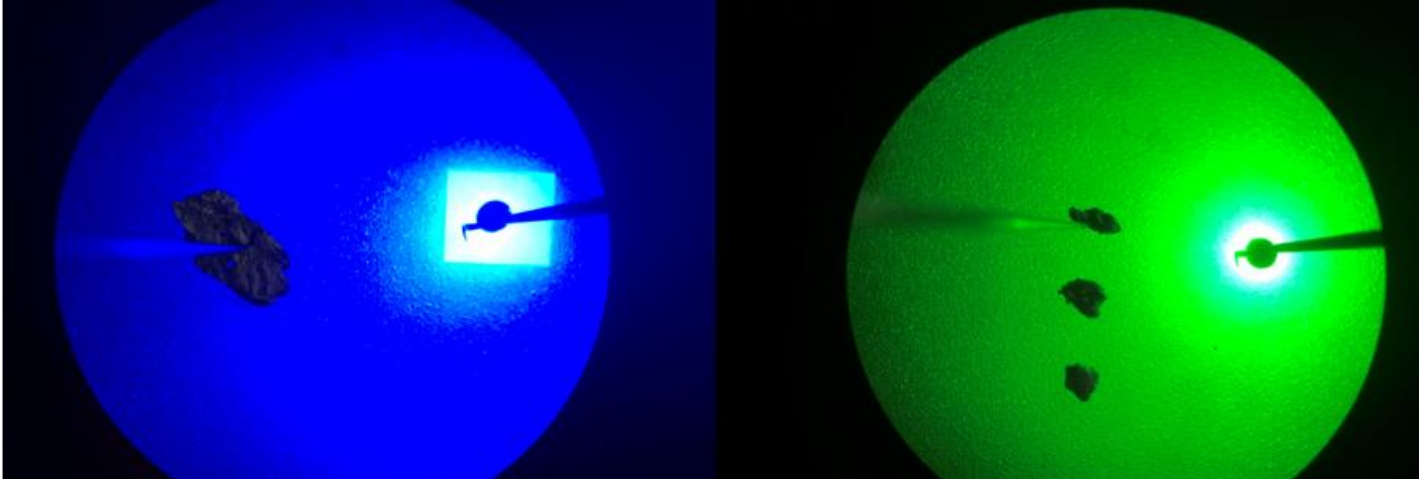
Dr Morrison specialises in the assessment of innovative and potentially disruptive technologies. As a contracted expert, Dr Morrison supports the evaluation of innovation actions for both the European Commission and the UK's innovation agency (Innovate UK).



## Cascade LED collaborations

BluGlass' cascade LED collaborations with both Bridgelux and Luminus experienced delays during the quarter, as a result of COVID-19 impacts on each of our partners.

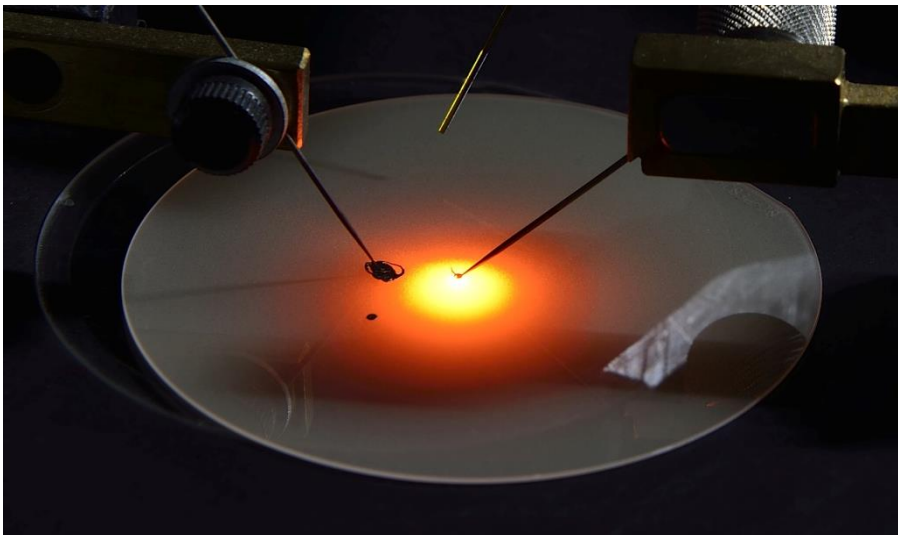
As a consequence of those delays, BluGlass refocused development efforts in-house and demonstrated iterative improvements in the light output of Cascade LED test structures using RPCVD tunnel junctions. BluGlass is waiting to process new cascade LED chips to benchmark these latest developments, currently being fabricated overseas.



*Images: A preliminary demonstration of the electroluminescence from a two-colour (green on blue) cascade LED using BluGlass' RPCVD active-as-grown tunnel junction technology. These images are both from the same cascade LED wafer, with the electrical contacts configured to drive only the lower blue LED (left) and only the upper green LED (right).*

A recent video showing sequential green and blue light emission from an RPCVD grown tunnel junction cascade LED is available to watch here [www.bluglass.com.au/video](http://www.bluglass.com.au/video).

BluGlass has made good progress in optimising the key mechanisms required to drive individual LED performance (the top and bottom LEDs) in cascade structures as shown above.



*Wafer level test of RPCVD grown red LED*

### microLEDs

BluGlass continues to work with partners to advance its R&D on microLEDs for red-green-blue (RGB) applications. BluGlass has recently demonstrated good progress towards developing RPCVD grown red LEDs.

Our microLED foundry customer orders for the quarter were also impacted by COVID 19 with some of our customers currently on hold and unable to process and test devices. Despite the facility disruption, communication and preparation for next design iterations and orders continue.

## Aixtron G4 2800 Retrofit project and commercial scaling of RPCVD



*The AIXTRON G4 system being retrofitted onsite at BluGlass*

After an initial delay, the Aixtron G4 retrofit is now undergoing final assembly with all international parts, machined by our specialist manufacturing partners, now onsite at BluGlass.

Our collaboration partner, AIXTRON, have completed their software installation onsite for the RPCVD retrofit prior to border closures in Australia.

The project remains on track to come online by mid-year. The commissioning delay continues to have no impact on the project timelines of other BluGlass activities in laser diode product development plans or customer and partner collaborations. The BLG-300 and BLG-300II are in full operation across extended shifts to continue our development schedule.

### Capital Raising and cash preservation initiatives

Subsequent to the end of the quarter, BluGlass completed a successful capital raising of \$5.8m (before costs) comprising a Rights Issue of \$4.7M and a Shortfall Placement of \$1.1M. These funds will be used to expedite the development of the Company's laser diode business and product pipeline to deliver customer products in early 2021.

BluGlass' cash position at the end of the quarter (before Rights Issue and Shortfall Placement receipts) was \$1.3M.

In April, the company entered an R&D loan facility with Radium Capital to advance a portion of BluGlass' FY2020 R&D Tax rebate. Following the successful rights issue, the R&D tax rebate loan has now been repaid in full, including interest for the period the loan was advanced. BluGlass expects to receive the full R&D tax rebate of approximately \$2.5M in September 2020.

Customer foundry revenue for the quarter was significantly lower than the previous quarter, due to customer impacts by COVID-19 with the majority of our customers in Europe and the USA. Foundry receipts for the quarter were \$81,000 with year to date receipts of \$558,000.

BluGlass has also announced several cash preservation measures for the remaining financial year to maximise our development runway as we move towards repeat laser diode customer revenues in CY2021.

These measures include the BluGlass Board and management taking 50% of their fees as shares until the end of the 2020 financial year (the proposed issue of shares to directors being subject to shareholder approval). Our staff will also take 25% of salary as shares for the same period. At the end of the financial year the Board will assess if a further extension of these measures is required.

BluGlass management are also working with the federal government and advisors on possible government assistance for the business in the current operating environment, which could include:

Assistance	Amount available	Availability
Payroll tax relief	Approximately \$30,000	Available for the 3 months up to the end of the financial year
PAYG tax relief	\$100,000	\$50,000 available to 30 June 2020 and a further \$50,000 to 30 September 2020.

Job Keeper payments	\$350,000 should be available for 18 staff	\$175,000 available this quarter and a further \$175,000 in the next.
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Other cash preservation measures include:

- directing development focus to BluGlass' nearest future revenue generating applications
- reducing the reliance on external service providers and consultants where possible
- putting in place all available forms of government financial assistance

Once again, the Board and Management extend their appreciation of our loyal shareholders for their ongoing support of the Company and shared vision for the RPCVD technology.

This announcement has been approved for release by the board.

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### About BluGlass

BluGlass Limited (ASX: BLG) is a global leader commercialising a breakthrough technology using Remote Plasma Chemical Vapour Deposition (RPCVD) for the manufacture of high-performance LEDs and other devices. BluGlass has invented a new process using RPCVD to grow advanced materials such as gallium nitride (GaN) and indium gallium nitride (InGaN). These materials are crucial to the production of high-efficiency devices such as high-brightness light emitting diodes (**LEDs**) and **laser diodes** and **microLEDs** used in next-generation devices from lighting, displays, virtual reality systems and industrial cutting and welding.

RPCVD's unique low temperature, low hydrogen growth platform offers many potential benefits to electronics manufacturers over existing growth techniques; including higher efficiency, lower cost, greater substrate flexibility and has the potential to enable novel applications.

In 2019, BluGlass launched its direct-to-market Laser Diode business unit to exploit its unique tunnel junction technology capability in the high-value and high-margin laser diode market. BluGlass expects to launch its first laser diode commercial product in 2021. **Contact:** Stefanie Winwood +61 2 9334 2300 [swinwood@bluglass.com.au](mailto:swinwood@bluglass.com.au)

## Appendix 4C

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

**Name of entity**

Bluglass Limited

**ABN**

20 116 825 793

**Quarter ended ("current quarter")**

31 March 2020

<b>Consolidated statement of cash flows</b>	<b>Current quarter \$A'000</b>	<b>Year to date (9 months) \$A'000</b>
<b>1. Cash flows from operating activities</b>		
1.1 Receipts from customers	81	558
1.2 Payments for		
(a) research and development	(630)	(2,072)
(b) product manufacturing and operating costs	-	-
(c) advertising and marketing	(32)	(55)
(d) leased assets	(78)	(278)
(e) staff costs	(808)	(2,588)
(f) administration and corporate costs	(152)	(1,025)
1.3 Dividends received (see note 3)		
1.4 Interest received	3	29
1.5 Interest and other costs of finance paid	-	-
1.6 Income taxes paid	-	-
1.7 Government grants and tax incentives	-	2,366
1.8 Other (provide details if material)	-	-
<b>1.9 Net cash from / (used in) operating activities</b>	<b>(1,616)</b>	<b>(3,065)</b>
<b>2. Cash flows from investing activities</b>		
2.1 Payments to acquire:		
(a) entities		
(b) businesses	-	-
(c) property, plant and equipment	(601)	(1,674)
(d) investments	-	-
(e) intellectual property	-	-
(f) other non-current assets	-	-

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

Consolidated statement of cash flows		Current quarter \$A'000	Year to date (9 months) \$A'000
2.2	Proceeds from disposal of:		
	(a) entities	-	-
	(b) businesses	-	-
	(c) property, plant and equipment	-	-
	(d) investments	-	-
	(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)	-	-
<b>2.6</b>	<b>Net cash from / (used in) investing activities</b>	<b>(601)</b>	<b>(1,674)</b>

<b>3.</b>	<b>Cash flows from financing activities</b>		
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	-	5
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)	-	-
<b>3.10</b>	<b>Net cash from / (used in) financing activities</b>	<b>-</b>	<b>5</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	3,599	6,116
4.2	Net cash from / (used in) operating activities (item 1.9 above)	(1,616)	(3,065)
4.3	Net cash from / (used in) investing activities (item 2.6 above)	(601)	(1,674)



<b>Consolidated statement of cash flows</b>		<b>Current quarter \$A'000</b>	<b>Year to date (9 months) \$A'000</b>
4.4	Net cash from / (used in) financing activities (item 3.10 above)	-	5
4.5	Effect of movement in exchange rates on cash held	-	-
<b>4.6</b>	<b>Cash and cash equivalents at end of period</b>	<b>1,382</b>	<b>1,382</b>

<b>5.</b>	<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	<b>Current quarter \$A'000</b>	<b>Previous quarter \$A'000</b>
5.1	Bank balances	58	43
5.2	Call deposits	1,324	3,556
5.3	Bank overdrafts	-	-
5.4	Other (provide details)	-	-
<b>5.5</b>	<b>Cash and cash equivalents at end of quarter (should equal item 4.6 above)</b>	<b>1,382</b>	<b>3,599</b>

**6. Payments to related parties of the entity and their associates**

6.1 Aggregate amount of payments to related parties and their associates included in item 1

6.2 Aggregate amount of payments to related parties and their associates included in item 2

<b>Current quarter \$A'000</b>
63
-

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

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

**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.*

	<b>Total facility amount at quarter end \$A'000</b>	<b>Amount drawn at quarter end \$A'000</b>
7.1 Loan facilities	-	-
7.2 Credit standby arrangements	-	-
7.3 Other (please specify)	-	-
<b>7.4 Total financing facilities</b>	-	-

7.5 **Unused financing facilities available at quarter end** -

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.

<b>8. Estimated cash available for future operating activities</b>	<b>\$A'000</b>
8.1 Net cash from / (used in) operating activities (Item 1.9)	(1,616)
8.2 Cash and cash equivalents at quarter end (Item 4.6)	1,382
8.3 Unused finance facilities available at quarter end (Item 7.5)	-
8.4 Total available funding (Item 8.2 + Item 8.3)	1,382
8.5 <b>Estimated quarters of funding available (Item 8.4 divided by Item 8.1)</b>	<b>1</b>

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

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: Yes

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: Yes. BluGlass has successfully completed a \$5.86 million capital raise in April.

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: Yes, we expect BluGlass to be able to continue its operations and meet its business objectives as outlined in our quarterly cash flow update and above.

**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: 30 April 2020

Authorised by: The Board

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**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.