**Submission to the Tasmanian Department of Police, Fire and Emergency Management into the Independent Review into the June 2016 Tasmanian Floods.**

Dear Mr Blake

Thank you for providing Geoscience Australia an opportunity to provide a submission into the Independent Review into the June 2016 Tasmanian Floods. Below are some comments for consideration by the Review Panel in their reporting on the matters identified in the Terms of Reference.

***The effectiveness of the strategies, preparedness and plans related to managing flood risk in Tasmania that were in place prior to the June 2016 floods occurring; including existing and potential levee systems.***

**Risk Analysis**

Risk analysis involves developing an understanding of risk, which is an important step in the risk management process and provides the foundation upon which informed decisions on mitigation may be based. Analysing risk allows priority areas to be targeted for mitigation and can assist in the allocation of limited resources. Risk analysis may therefore play an important role in cost-benefit analysis, which compares the costs of a particular action or project against its potential benefits. Ideally, direct and indirect costs as well as tangible and intangible costs are captured. Analysis across a wide range of probabilities of occurrence up to, and including the probable maximum flood is necessary to understand the full spectrum of flood risk that a community faces. It can also assist in the calculation of average annual damages.

Information on flood hazard, combined with information on exposure and vulnerability can be used to analyse flood risk. Collecting building damage information following a disaster can be used to develop empirical vulnerability models. The capture of building information with information on flood hazard provides important input into flood risk analysis. Ideally this information would be captured in a nationally consistent accessible database, incorporating important attributes such as type of foundation, ground floor height, ground storey height, wall material, roof material, number of storeys and building floor area.

**Mitigation**

Mitigation options for legacy and/or high risk buildings could be explored to evaluate the cost effectiveness of mitigation strategies such as house raising.

Incentive mechanisms could be established to promote the uptake of mitigation investment. Typically insurance policies cover the replacement or reestablishment of goods as “like for like”. However “Building back better” measures, such as using more flood resilient materials in the rebuild phase, will reduce the impact during the next flood.

Levees can be a useful structural flood mitigation tool. However, levees can also engender a false sense of security, with those protected by levees believing that they are flood free. Not only can levees be overtopped, but they can also fail. Where failure occurs, the damage caused can often be much greater than if the water was allowed to rise slowly, because of the sudden force resulting from the levee breach. Furthermore there is a tendency to increase development behind the safety of levees. Instead, development controls should be established and/or maintained to prevent the increase of exposure behind levees.

Development of appropriate communication strategies to convey key messages to the community and stakeholders is vital to influence decision making aimed at reducing flood risk.

***Community preparation, resilience and awareness, including awareness of insurance matters, relating to major flood events in Tasmania.***

**Open Access to Flood Studies**

Flood studies funded by local, state or federal government are commissioned in the interest of communities to ensure risk to people and property is protected, minimised or mitigated against effectively. There are numerous benefits for both the consultant and the commissioning organisation to licensing flood studies openly, while still retaining the copyright (See Appendix A).

Open access will facilitate use or incorporation of this flood study material into other services and products that will benefit the economy and the community. However, publicly funded flood studies are not always accessible or reusable by the public. The solution is the use and application of the Creative Commons Attribution 4.0 Licence (CC BY 4.0) for both the existing studies and future studies. Most Australian Governments have endorsed implementation of the Australian Governments’ Open Access and Licensing (AusGOAL) programme as it recommends and supports the use of the CC BY 4.0 licence.

Geoscience Australia’s investigations have identified that the majority of existing flood studies are owned by the commissioning local governments (even though the flood study materials themselves may suggest otherwise). We are seeking support of each State Government to invite their Councils to consent to the application of the CC BY 4.0 Licence to their flood studies. Once consent is obtained, the task of applying the CC licence to the flood studies could be completed easily with software and other support provided by GA.

To prevent this issue recurring for flood studies procured in future, we have developed specific Intellectual Property and Licencing clauses for insertion into procurement contracts to ensure that flood studies are 'procured open'.

GA believes the development and implementation of a principles based “National Framework for the Procurement of Hazard Information” would be more effective and encompassing than providing a bespoke set of clauses for insertion into contracts that intend to deal with copyright alone. Adoption of the Framework will provide better outcomes for both the community and government. It will enable more effective and efficient reuse of the material that the Commonwealth funds (by the community), as well as the hazard engineering community.  It would (more efficiently) enable research across a range of domains for which the Commonwealth, States and Territories would be beneficiaries.  We believe this approach would ensure that while funds that are expended on a hazard information output are spent once, the output itself could be discovered, and legally and efficiently used many times, by the many and diverse members of the community and hazard management sector.

***The use and efficacy of forecasting, community alerts, warnings and public information by authorities in responding to flood events.***

**Warnings**

Following the widespread flooding in Queensland in early 2011, Geoscience Australia conducted an engineering survey of damage buildings and a social survey of impacted households in the Brisbane and Ipswich areas (Canterford *et al.* 2016). The social survey was repeated in 2013 following another flood event. The research found that people need to be receptive to the warning for the warnings to be effective. That is, people needed to understand that it was possible for their property to flood to believe that the warning was relevant to them. Where people did understand that a warning was relevant to them and where they received sufficient lead time, they were able to save contents through either removing the contents from their house or by raising it above the anticipated flood depth. The idea of warning effectiveness was identified in the National Review of Warnings and Information (Emergency Management Victoria 2014).

**Accessing Satellite Imagery for Emergency Management (Refer to Appendix B)**

Geoscience Australia is the national access point for public good satellite data and is the Australian Authorised User of the International Charter for Space and Major Disasters (<https://www.disasterscharter.org>), and the Copernicus Emergency Management Service (<http://emergency.copernicus.eu/>). Through these international collaborations and its own resources, GA is able to provide satellite imagery and derived extent products of natural disasters. These products have provided useful information to state emergency services and related government departments for flood events such as the 2010-2011 Queensland floods, the 2012 NSW floods and the recent 2016 NSW floods. An information overview of what is available and how to request satellite imagery assistance is provided in **Appendix B.**

**References**

Canterford, S., Juskevics, V., Middelmann-Fernandes, M., Wehner, M & Oh, W. (2016) *Household experiences of flooding in Brisbane and Ipswich, Queensland.* *Results of Geoscience Australia surveys following flooding in South East Queensland in 2011 and 2013.* Record 2016/30. Geoscience Australia, Canberra. <http://dx.doi.org/10.11636/Record.2016.030>

Emergency Management Victoria 2014. National Review of Warnings and Information: Final Report, Victorian Government, Melbourne, Cube Group, <http://fire-com-live-wp.s3.amazonaws.com/wp-content/uploads/National-Review-of-Warnings-and-Information-Final-Report-v1.0-ANZEMC-Endorsed.pdf> , viewed 15 November 2016.

**Attachment A: Benefits of open access to hazard information**

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| **Why is open access to flood studies important**  Flood studies funded by local, state or federal government are commissioned in the interest of communities to ensure risk to people and property is protected, minimised or mitigated against effectively. There are numerous benefits for both the consultant and the commissioning organisation to licensing flood studies openly, while still retaining the copyright. These benefits are outlined below.  Benefits to the community:   1. Flood hazard information will be freely available for the community to use to better understand the risk flood poses that at the household level. 2. The community will have access the same information the insurance companies are using to assess and price flood risk insurance premium, facilitating transparency for the consumer. 3. Re-use of this information will lower the cost to the taxpayer   Benefits to the consultant:   1. Openly licensed flood studies demonstrate the engineering community’s desire to contribute to broader community flood resilience. 2. Simplifies the process of undertaking a flood study. It makes it easier (and cheaper) for the flood engineering community to legally reuse the significant body of flood studies already produced. 3. AFRIP will display a portfolio of work by consulting engineers that will receive greater interest from the community, including other engineering firms and government and private clients alike.   Benefits to the commissioning organisation with IP owned by the consultant:  1. Reduction in the costs to maintain and undertake compliance of IP custodianship. costs associated with copyright management, protection and compliance  2. Openly licensed data allows the LGA to share the data or not.  3. Establishes a reuse platform (via the Portal) which lowers transaction costs to other contractors/developers who want to use the flood study outputs for LGA business.  Open access will facilitate use or incorporation of this flood study material into other services and products that will benefit the economy and the community. |

***Attachment B: Assessing satellite imagery for emergency management (see attached flier)***