

Our Ref: A23/99733

06 June 2023

Mr John Ramsay  
Executive Commissioner  
Tasmanian Planning Commission  
[tpc@planning.tas.gov.au](mailto:tpc@planning.tas.gov.au)

Dear Mr Ramsay,

## **GEORGE TOWN DRAFT LPS – REVISED FLOOD-PRONE AREAS HAZARD OVERLAY**

On 31 March 2023, the TPC directed George Town Council as the Planning Authority to:

*“Provide a map/diagram showing how the Flood-Prone Hazard Areas overlay would be amended. Clarify what areas of the Flood-Prone Hazards overlay are proposed to be removed, and what the threshold for the removal should be.  
**Response due Friday 26 May 2023**”.*

The revised Flood-prone Areas Hazard Overlay submitted by the Planning Authority to the Commission uses the following thresholds to include modelled flooded areas in the Overlay:

- Depth > 0.1 (100mm); or
- Depth x velocity product > 0.02m<sup>2</sup>/s (equivalent to H1); and
- Ponding > 100m<sup>2</sup> in total area.

SES supports these thresholds, noting that it is consistent with the methods contained in national best practice guidelines.

### **Background**

To assist the Planning Authority prepare a response to the matter, SES hosted a meeting on 18 April 2023, with Planning Authority representatives, Glenorchy City Council and Brighton Council staff representatives, LGAT, and flood consultants from Flussig Spatial, and WMAWater. At this meeting, the following matters were discussed:

- Accepted practice for filtering flood modelling results with a focus on Direct Rainfall and Rainfall-on-Grid models;
- Australian Rainfall and Runoff Guidelines (AR&R Guidelines); and
- Flood-Prone Areas Hazard Code (the Code).

The following information is provided in support of the George Town draft LPS – Flood-Prone Areas Hazard Overlay, and accords with the discussions held between SES and the Planning Authority representatives.

## Australian Rainfall and Runoff Guidelines

The AR&R Guidelines, Book 6, Chapter 7<sup>1</sup>, provides guidance on safety design criteria with respect to flood hazard that has a potential to cause damage or harm to the community. Flood hazard curves provided in section 7.2.7 of Chapter 7 describe flood hazards in the H1 category with a depth of up to 300mm and a velocity of up to 2.0m/s as being generally safe for people, vehicles, and buildings.

Section 7.3.2 of the Chapter calls up industry best practice guidance reference “*Two Dimensional Modelling in Urban and Rural Floodplains*”<sup>2</sup>.

The AR&R Guidelines - *Two Dimensional Modelling in Urban and Rural Floodplains*, Section 11.5.1 - Filtering Results, provides a detailed discussion of the difficulties in interpreting results of Direct Rainfall modelling (as has been used to prepare the Overlay). The guidance also provides several methodologies that may be used to decide what portion of the results is representative of catchment runoff, and what is representative of flooding. The methodologies include:

- Depth filter – Constant;
- Depth filter – Proportional to Peak Rainfall Depth;
- Flow cut-off filter;
- Velocity-depth filter;
- Catchment area cut-off; and
- Small pond filter.

## Australian Institute for Disaster Resilience – Handbook

*The Australian Institute for Disaster Resilience (AIDR) – Handbook 7-5 Flood Information to Support Land-use Planning*, provides guidance for selecting flood modelling for flood studies<sup>3</sup>:

*A key consideration in scoping studies is model selection and resolution, to help ensure that the modelling is fit for purpose to provide the base information in sufficient detail for the required outputs and to consider the level of post-processing required. This depends on the accuracy required, the scale of the base information used for inputs, the flood data available to validate the model and the shape of the floodplain. Guidance on this is available in Australian Rainfall and Runoff (Ball et al. 2016).<sup>4</sup>*

This National Guidance recognises that all flood modelling will require some level of post-processing to suit the purpose for which the model is intended to be used. It is appropriate

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<sup>1</sup> [Commonwealth of Australia \(Geoscience Australia\) 2019, Australian Rainfall and Runoff: A guide to flood estimation – Book 6 – Flood Hydraulics](#)

<sup>2</sup> [Engineers Australia 2012, Australian Rainfall & Runoff Revision Projects – Project 15 – Two Dimensional Modelling in Urban and Rural floodplains.](#)

<sup>3</sup> [Australian Institute for Disaster Resilience – Handbook 7-5 Flood Information to Support Land-use Planning – section 2.6 Sourcing flood information](#)

<sup>4</sup> Ball J, Babister M, Nathan R, Weeks W, Weinmann E, Retallick M, Testoni I (eds) 2016, Australian rainfall and runoff: A guide to flood estimation, Commonwealth of Australia, Canberra

for George Town Council to proceed with post-processing based on the guidance provided by the AR&R and the AIDR and the expertise of a suitably qualified flood modeller.

### **Differing filtering methods for differing catchments**

SES note that the methods used to filter the George Town draft LPS Overlay differ from those used by other Councils using Direct Rainfall modelling, such as Glenorchy City Council. This is appropriate and consistent with the best practice guidance as there is not one single method to use for depth and velocity flood model filtering. Flood modellers need to conduct analysis to determine the appropriate filters to use for the physical characteristics of the catchment on a case-by-case basis.

For example, 300mm of flood water in a 1%AEP event on relatively flat terrain and on a sandy soil, may tend to pond for short periods and not pose a risk to people, vehicles or buildings, compared to 300mm of flood water in a 1%AEP event in a steeper terrain which may be moving at a velocity sufficient to create an overland flowpath and pose a risk.

### **SES Advice**

SES recognise that the use of Direct Rainfall/Rainfall on Grid flood modelling, is becoming more common for use in urban areas for preparation of local stormwater management plans and Local Provisions Schedules.

Current best practice methods for post-processing Direct Rainfall modelling is provided by Australian Rainfall and Runoff Guidelines - Book 6, Chapter 7<sup>5</sup> and *“Two Dimensional Modelling in Urban and Rural Floodplains”*<sup>6</sup>, and the *Australian Institute for Disaster Resilience – Handbook 7-5 Flood Information to Support Land-use Planning*<sup>7</sup>.

Flood modelling should be completed by suitably qualified persons for the purpose of creating a Flood-prone Areas Hazard Overlay for inclusion in a planning instrument such as a Local Provisions Schedule.

All flood modelling used for landuse planning will require post-processing, including where appropriate filtering. National guidance on this process is contained in AR&R Guidelines and AIDR Handbook 7-5.

Yours sincerely



**Mick Lowe**

Executive Director SES and Volunteers

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<sup>5</sup> [Commonwealth of Australia \(Geoscience Australia\) 2019, Australian Rainfall and Runoff: A guide to flood estimation – Book 6 – Flood Hydraulics](#)

<sup>6</sup> [Engineers Australia 2012, Australian Rainfall & Runoff Revision Projects – Project 15 – Two Dimensional Modelling in Urban and Rural floodplains.](#)

<sup>7</sup> [Engineers Australia 2012, Australian Rainfall & Runoff Revision Projects – Project 15 – Two Dimensional Modelling in Urban and Rural floodplains.](#)

