

TERM OF REFERENCE 1: PREPAREDNESS AND PLANS – FLOOD LEVEES

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

1 FLOOD LEVEES

- (a) The purpose of flood levees is to protect assets and infrastructure that have been built on the flood plain and would be at risk during a flood event.
- (b) There are flood levees in both Launceston and Longford and these were effective during the June floods.
- (c) The Launceston Flood Authority is responsible for flood protection in Launceston.
- (d) Hydro Tasmania's involvement in flood levees in Launceston relates to the relationship between flows from Trevallyn Dam, the practice of silt raking to remove sediment from the Upper Tamar estuary and the role sediment plays in the effectiveness of the flood levees.
- (e) The ongoing collaboration between Hydro Tasmania and the Launceston Flood Authority to assess this issue is elaborated on below.
- (f) In addition to a need for flood levees in areas developed on flood plains, the identification and mapping of areas that are known to, or may be regularly flooded, is the preferred approach to provide a long term and more cost effective mitigation of potential flood impacts and to inform future planning. This systematic assessment is supported by the 2016 Tasmanian State Natural Disaster Risk Assessment (UTAS 2016).
- (g) The management of areas that are subject to flood risk is best implemented via the *Land Use Planning and Approvals Act 1993* through Planning Schemes by providing a framework for the management and restriction of the use and development of land.

2 LAUNCESTON FLOOD LEVELS

- (a) The effective area that water can travel safely through is a product of the river width and depth of the water. Increasing the water depth by containing the flow between levees enables more water to flow through the same width. In order to maintain the depth of the river channel below the levee crest the Launceston Flood Authority has previously undertaken a dredging program to remove sediment, and more recently a silt raking program which is considered more cost effective. Removing the sediment maintains the depth available for the water to flow through.
- (b) A collaboration has been established between Hydro Tasmania and the Launceston Flood Authority since 2015 to progress studies on the interaction between flows released from Trevallyn Dam, silt raking and sediment levels in the Upper Tamar estuary that may influence the effectiveness of the flood levees.
- (c) In August 2015 Hydro Tasmania staged a managed release of 25 cumecs of water for three days over the Trevallyn dam as a trial to assess the effectiveness of a controlled release of water from Trevallyn Dam, in conjunction with silt raking operations and strong tide events, to assist the removal of sediment from the Upper Tamar estuary. Approximately 19,000 cubic metres of sediment was removed from the Yacht Basin and Kings Wharf areas of the Upper Tamar Estuary during the trial. It took approximately 3 months for the silt to return to pre-trial levels.
- (d) Prior to the June 2016 flood event silt levels in the upper Tamar Estuary area were at their highest level since 2010 and post flood at the lowest levels measured since bathymetric surveys commenced in 2008. Publicly available information indicates that during the June 2016 flood over 800,000 cubic metres of sediment was removed from the Upper Tamar estuary between Kings Bridge and the University of Tasmania including approximately 380,000 cubic metres from the Yacht Basin area.¹
- (e) Hydro Tasmania and the LFA have continued collaboration on the issue of flows, silt raking and the role of sediment in the effectiveness of the Launceston Flood levees. The results of the 2015 silt raking trial and the

¹ As reported in an article published in the Examiner on 26 November titled "Floods scour sediment from estuary" by Doug Dingwall.

performance of the levees and sediment movement during the 2016 floods provide valuable inputs to this collaboration. Additional studies and scenario based analyses are currently being conducted by the LFA and the results of these studies will assist to develop actions as required to ensure the ongoing effectiveness of the Launceston flood levees.

3 FLOOD MAPPING

- (a) While flood levees can provide short term relief to the potential impact of flooding, the identification of areas that are known to, or may, be regularly flooded, is the preferred approach to provide a long term and more cost effective mitigation of potential flood impacts and to inform future planning. This systematic assessment of flood hazards risks in riverine systems is supported as a proposed treatment in the 2016 Tasmanian State Natural Disaster Risk Assessment. Flood mapping needs to be completed for this approach to be implemented. At a minimum a program that identifies areas that may be flooded with a 2%, 1% and 0.5% recurrence interval² should be identified, and include consideration of climate change and in particular climate variability.
- (b) The management of areas that are subject to flood risk is best implemented via the *Land Use Planning and Approvals Act 1993* through Planning Schemes by providing a framework for the management and restriction of the use development. While the flood prone areas have been identified in a number of planning schemes across the State, the extent of this mapping has been limited and ad hoc in nature, without a standardised approach or methodology³.
- (c) Under the current proposed reforms, which would result in the development of a Statewide Planning Scheme, flood hazards are to be managed through the Riverine Inundation Hazard Code. The purpose of this code is to manage use and developments in areas at risk from periodic or permanent riverine inundation so that:
- (i) people, property and infrastructure are not exposed to an unacceptable level of risk;

2 That is, 1 in 50 year, 1 in 100 year and 1 in 200 year floods, which are the frequencies commonly used for land use planning purposes.

3 2016 Tasmanian State Natural Disaster Risk Assessment, UTAS, 2016, p.81.

- (ii) future costs associated with options for adaptation, protection, retreat or abandonment of property and infrastructure are minimised;
 - (iii) the risk from riverine inundation hazard to other properties or public infrastructure is avoided or reduced; and
 - (iv) development is precluded on land that will unreasonably affect flood flow or be affected by permanent or periodic flooding from a riverine watercourse.
- (d) However, the Explanatory Document for a draft of the Statewide Planning Scheme (March 2016), requires that local Planning Authorities take responsibility for flood mapping using their own riverine inundation data or data from other sources in determining the extent of the riverine inundation hazards without any consideration of a standard annual exceedance probability or consequence framework. Hydro Tasmania supports the development and implementation of a standardised approach to the mapping of flood prone areas across the state.