11   Conclusions and Recommendations

Flood modelling has been undertaken for the Merimbula Lake and Back Lake catchment areas in the Bega Valley Shire LGA in order to determine the existing flood behaviour, as part of the NSW Floodplain Management Process.

Modelling was undertaken in XP-RAFTS and Delft3D, for the hydrological and hydraulic models respectively.

A range of sensitivity tests were undertaken to determine the influence of a number of model parameters on model outputs, namely:

- Catchment roughness;
- Sediment composition;
- The entrance condition; and,
- The adopted breaking wave coefficient.

The sensitivity assessment found that changes to model parameters had relatively small impacts on the majority of the study area, with all observed changes in peak flood levels within 0.1m.

The XP-RAFTS hydrological model was validated against an alternative runoff calculation using the Probalistic Rational Method from AR&R. The validation demonstrated a good correlation between estimated catchment flows from both calculation methods.

The hydraulic model was calibrated to both tidal and flood conditions based on recorded date from four historical events. The process demonstrated a good correlation between modelled and historical levels.

The validated models were used to asses a range of design events, namely:

- 20% AEP;
- 10% AEP;
- 5% AEP;
- 2% AEP;
- 1% AEP;
- 0.5% AEP; and,
- The Probable Maximum Flood (PMF)

Each event was run for a range of durations in order to determine critical durations for the study area. Peak water levels, depth and velocities, as well as provisional flood hazards and hydraulic categories were determined.

An assessment was undertaken to recommend an appropriate Flood Planning Level (FPA) for the study area. Based on a review of a number of factors including land uses, overfloor flooding damages in design events, and differences between design event levels, an FPA of the 1% +0.5m was recommended for the study area. This may be revised during the development of the Floodplain Risk Management Study and Plan for the study area following a detailed analysis of existing land use, future development and true hazard mapping.