

1 FLOOD MANAGEMENT GUIDELINE

This guideline provides additional information on Flood Management. This guideline outlines the relevant State government policies and manuals as well as completed Lake Macquarie flood studies and plans.

1.1 FLOODPLAIN DEVELOPMENT MANUAL AND GUIDELINES

The [NSW Floodplain Development Manual – Management of Flood Liable Land](#) (April 2005) outlines ways to assess and manage flood risk that allows for urban development and agricultural production on floodplains.

The *Manual* recognises development on flood liable land is necessary to satisfy the social and economic needs of the community, while being compatible with natural ecosystems.

The NSW Government's Flood Prone Land Policy, which forms the basis of the *Manual*, uses a risk management hierarchy of avoidance, minimisation (using planning controls), and mitigation works (to include environmental enhancement).

The different types and causes of flooding and the general framework and objectives for flood management are contained in the *NSW Floodplain Development Manual*.

<http://www.environment.nsw.gov.au/floodplains/manual.htm>

Recent updates to the *Manual* include consideration of the implications and effects of climate change, particularly sea level rise. NSW policies and guidelines that need to be considered include:

- [Floodplain Risk Management Guideline - Practical Consideration of Climate Change](#) (Oct 2007)
- [NSW Coastal Planning Guidelines: Adapting to Sea Level Rise](#) (August 2010)
- [Flood Risk Management Guide – Incorporating sea level rise benchmarks in flood risk assessment](#) (August 2010)

Council is guided by the principles contained within the *Manual* and *Guidelines* when assessing development.

1.2 TYPES OF FLOODING IN URBAN AREAS

Types of local flooding in urban areas comprise minor system and major system flooding.

Minor system (or nuisance) flooding in urban areas comprises relatively minor localised flooding with an Annual Recurrence Interval (ARI) of 2-5 years. It occurs due to surcharge of stormwater onto streets and roads. Stormwater infrastructure is usually designed to avoid minor system flooding.

Major system flooding in urban catchments comprises major flooding with an Annual Recurrence Interval (ARI) of 100+ years. Major flooding will travel in planned and unplanned routes overland to the receiving environment, and may cause property damage or injury along the way.

1.3 FLOODPLAIN MANAGEMENT STUDIES AND PLANS

Council, through its Floodplain Management Committee, prepares flood studies, floodplain risk management studies, floodplain risk management plans, and implementation programs major creeks and catchments within Lake Macquarie City, in accordance with the NSW State Government's [Floodplain Development Manual](#).

As at September 2012, Council has completed floodplain risk management studies and plans for the following major catchments:

- Dora Creek waterway downstream from Stockton Creek – 1998 (does not include sea level rise)
- Cockle Creek (Barnsley/Edgeworth/Glendale/ Argenton/Boolaroo/Teralba) – 2004 (does not include sea level rise)

- North Creek (Warners Bay) - 2010 (does not include sea level rise)
- Stony Creek (Blackalls/Toronto) - 2011 (includes sea level rise)
- [Lake Macquarie waterway \(The Lake\) - 2012](#) (includes sea level rise)

Flood studies have been completed for:

- LT Creek (Fassifern) - 2010
- South Creek (Warners Bay) - 2011

Flood studies are underway for the Winding Creek (Cardiff/Glendale) catchment and Jewells Wetland catchment (incorporating Scrubby, Johnsons, Crokers and Freshwater Creeks at Mount Hutton, Windale, Gateshead, Bennetts Green, Jewells, Redhead).

A separate Area Plan has also been prepared to guide development of the flood prone areas in Dora Creek township.

These studies and risk management studies/plans must be considered when proposing new developments in flood prone areas covered by a study or plan.

Check with Council to see if there is a completed Plan covering your location.

1.4 EFFECTS OF CLIMATE CHANGE AND SEA LEVEL RISE ON FLOODING

Climate change is predicted to cause an increase in sea level and changes to rainfall frequency and intensity. Sea level rise will increase flood levels in the lake and tidal creeks. Other effects of climate changes on flooding may include:

- increased rainfall intensity that may exacerbate flash flooding;
- increased foreshore erosion and inundation of low lying coastal and foreshore lands; and
- increased lake wave heights and run up.

Developers will need to consider potential impacts of climate change, including sea level rise, in their designs and plans to reduce flood risk. For areas covered by a Flood Plan that has not considered the effects of sea level rise (see 1.3 above), the effects of sea level rise will have to be included in the development assessment.

1.5 FLOOD STUDIES FOR DEVELOPMENTS

Where no Study or Plan has been completed, applicants may be required to prepare a local Floodplain Management Study or Plan, depending on the nature of the development and potential flooding risks and constraints.

Flood Study Requirements

Provide a technical investigation of flood behaviour, flood risk and nature of flooding by defining the extent, level and velocity of floodwaters and distribution of flood flows across various sections of the defined floodplain, for the full range of flood events up to and including the Probable Maximum Flood (PMF).

The following information should be provided in the flood study:

- 20-year, 100-year and Probable Maximum Flood (PMF) ARI Peak discharge at nominal intervals for each stream within the study area;
- A detailed map showing the 20-year and 100-year ARI flood levels/extents and hazard areas (high/low categories);
- Definition of the hydraulic categories for the floodplain (floodways, flood storage and flood fringe);

Flood Study Requirements

- Identification of major controlling factors (eg. roads, culverts etc);
- Outline reason(s) for flooding (eg. backwater effects, localised flooding);
- Outline potential impact(s) of flooding on adjoining land (upstream and downstream);
- Risk Mitigation Measures
- Implications of climate change induced sea level rise and increased frequency and intensity of rainfall events (where applicable)

The flood assessment should be undertaken to follow the objectives, guidelines, and standards contained within the *NSW Government's Floodplain Development Manual, April 2005* and subsequent policies and guidelines (see 1.1 above). The Flood Study must be prepared by an appropriate and qualified consulting engineer.