Considering flooding in land use planning guideline

This guideline provides advice to councils on flood-related land use planning and the areas where flood-related development controls should apply.

This guideline helps NSW communities to be more resilient to flooding beyond the 1% Annual Exceedance Probability[1] (AEP). This involves considering the management of flood risk for the full range of flooding up to the Probable Maximum Flood (PMF).

This is consistent with the NSW Government's Flood Prone Land Policy, set out in the NSW Floodplain Development Manual, which supports the resilient development of flood-prone land. Flood-prone land, or the floodplain, is defined in the manual as the land susceptible to flooding by the PMF event. The policy acknowledges that flood-prone land is a valuable resource that should not be sterilised by unnecessarily precluding its development. It outlines that each local council is responsible for managing the flood risk to reduce the risk to life, property damage and other impacts in their local government area.

The manual outlines the flood risk management (FRM) process to help councils make informed decisions on managing flood risk to both existing and future development. The FRM process involves studies to understand flood behaviour and examine management options, and the development and implementation of FRM plans.

The manual sets out key issues relating to managing risk to existing and future occupants of flood-prone land that need consideration in land use planning. These include the:

- safety of people including evacuation considerations
- management of flood risk, to reduce flood damage to public and private property and infrastructure
- management of the cumulative impacts of development
- management of the impacts of development on emergency services.

All terms referenced in this guideline have the same meaning as those in the manual unless defined at the end of this guideline.

Applying the guideline

It is at the discretion of the individual councils when they apply the information contained within this guideline. It is intended that as councils undertake or update studies under the FRM process or obtain additional flood information, that the information would support the implementation of this guideline.

Councils are not required to use all three of the categories outlined in this guideline. Where more than one type or area is used, the Regional Evacuation Consideration Area (RECA) may overlap with the Flood Planning Area (FPA) or Special Flood Considerations (SFC) in the areas they cover.

[1] The 1% AEP flood is equivalent to the 100-year Annual Recurrence Interval (ARI) and has a 1% chance of happening every year.

Considering flooding in land use planning

The full range of flooding up to and including the PMF must be considered when undertaking strategic land use planning. This includes the preparation of:

- regional, metropolitan and district plans
- local strategic planning statements
- environmental planning instruments
- planning proposals.

Understanding how flood constraints vary

The key constraints that result from flooding on land are:

- Flood function. Determining flood function involves identifying the location of floodways, flood storage areas, and flood fringe areas. Floodways and flood storage areas are sensitive to change in flood behaviour due to activities such as filling or more intense development. Flood Function[2] (Department of Planning, Industry and Environment, 2020) provides guidance on determining these areas.
- Flood hazard. Floods are hazardous to people, and public and private infrastructure. The degree of flood hazard varies between locations in the floodplain and flood events of different scales. Flood Hazard[2] (Department of Planning, Industry and Environment, 2020) provides guidance on understanding flood hazard and its variation.
- Extent and behaviour of flooding. Understanding the extent of the full range of flood events and how flood function and flood hazard may change between events can enable the associated constraints on land to be considered in decision-making. This is discussed in Developing Flood Information to Support Land Use Planning[2] (Department of Planning, Industry and Environment, 2020).
- Risk to life, such as the area identified by council under the FRM process as requiring related development controls.

The Flood Emergency Response Classification of Communities Guide[2] (Department of Planning, Industry and Environment, 2020) can assist councils in understanding areas where related development controls may need consideration.

Understanding these constraints allows controls to be developed for the three key areas, outlined below, that are used in land use planning decision-making. The controls applied in these areas will vary with location, constraints and type of development.

Where flood-related development controls may be applied

There are three different categories where flood-related development controls may be applied/considered. These are:

- Flood Planning Area (FPA),
- Regional Evacuation Consideration Area (RECA), and
- Special Flood Considerations (SFC).

[2] Note – these documents are currently in draft and are anticipated to be released as part of the Floodplain Development Manual update

Flood Planning Area (FPA)

The FPA defines the area where the majority of flood-related development controls apply. It is the area below the flood planning level (FPL) and may extend to include additional areas as outlined below. The FPL is generally a combination of the defined flood event (DFE) plus a freeboard.

The DFE is selected by council, (generally through the FRM process outlined in the manual) as the basis for limiting the likelihood of exposure to flooding and associated risks to life and property damage. The manual identifies the 1% AEP flood event, or an equivalent historic flood, as an appropriate starting point for determining the DFE for development controls, including for residential development. The manual allows councils to select a rarer DFE (altering the FPL and FPA) to address broad scale flood impacts in consideration of the social, economic, environmental and cultural consequences associated with floods of different probabilities.

The typical freeboard for residential development due to flooding from waterways, such as rivers or creeks, is 0.5m. A lower freeboard or other approaches to freeboard may be used where the consequences to people and property of low probability flood events are assessed as minor through the FRM process.

Councils proposing a different FPL are required to demonstrate and document the merits of this approach through the FRM process.

However, in some cases it may be appropriate to extend the FPA to include additional areas where low probability events have the potential for high consequences. These additional areas may include areas where new floodways develop in flood events rarer than the DFE (for example in the 1 in 500-year flood event); or where the scale of damages in more extreme events warrants additional development controls.

Controls applied within the FPA may in some circumstances relate to floods rarer than the DFE. An example is where building controls for structural adequacy and floor levels relative to a rarer flood may be required to address the risk to life.

Regional Evacuation Consideration Area (RECA)

The RECA includes areas that have known evacuation considerations within or outside the floodplain (due to isolation). It includes areas identified in a regional flood evacuation strategy or flood-related state emergency sub-plans by the NSW State Emergency Service. Controls in the RECA would generally relate to:

- increases in dwelling densities that would have a significant impact on the ability of the existing community to evacuate on existing evacuation routes within the available warning time.
- vehicle connectivity to regional flood evacuation routes consistent with the Hawkesbury Nepean Designing Safer Subdivisions Guide (2007).

Special Flood Considerations (SFC)

This category relates to a number of land uses and/or considerations located between the FPA and the PMF extent that require specific controls relating to the management of risk to life and the risk of hazardous materials on the community and the environment. These controls generally relate to:

- Critical, sensitive and vulnerable uses that require ongoing functionality during and after a flood

event such as hospitals with emergency facilities, emergency services facilities, utilities, and community evacuation centres.

- Critical, sensitive and vulnerable uses that require high levels of assistance with evacuation, such as aged care homes, seniors housing, group homes, boarding houses, hostels, caravan parks, schools and childcare facilities and hospitals.
- Hazardous industries or hazardous storage establishments that require containment of hazardous materials.
- Circumstances, generally defined through the FRM process where development controls might be needed to address risk to life may include (but not limited to):
    - Areas covered by an adopted council policy or plan on risk to life.
    - Areas where increases in dwelling densities would have a significant impact on the ability of the existing community to evacuate on existing evacuation routes within the available warning time.
    - Areas where development is isolated by floodwaters and terrain for an extended period (such as high flood island or trapped perimeter) and in cases such as low flood islands are inundated.
    - Areas where development may have evacuation capacity limitations.
    - Areas behind flood levees which may have warning and/or evacuation limitations.
    - Areas impacted by either high hazard or/and H3 to H6 hazard vulnerability thresholds in the PMF as defined Flood Hazard[2] (Department of Planning, Industry and Environment, 2020), and unable to safely evacuate.
    - Areas where subdivision layouts and connections to local or regional evacuation routes are needed to be consistent with the Hawkesbury Nepean Designing Safer Subdivisions Guide.
    - Areas where circumstances other than those identified above which a council identifies as requiring controls to address risk to life.

Maps

All areas where flood-related development controls apply should be mapped and maps made publicly available. This could entail being published in Development Control Plans, Local Environment Plan, other relevant environmental planning instruments or on a council website.

Further Information

Please contact the relevant regional offices of the Department of Planning, Industry and Environment (www.planning.nsw.gov.au).

Definitions

Definitions in this guideline are consistent with those in the Floodplain Development Manual (2005) or its update except for those outlined below.

Defined flood event (DFE) is the flood event selected by council for the management of flood risks related to development. This is generally determined in the FRM process as the basis for limiting community exposure to flooding and its consequences.

Flood Behaviour refers to the characteristics of flood waters interacting with the landscape. These characteristics include the location, depth, velocity, timing, volume, and period of inundation related to flood water.

Flood planning level (FPL) is a combination of the defined flood event (DFE) level and a freeboard (typically 0.5 metres).

Hazardous Materials is any item or agent (biological, chemical, radiological, and/or physical) that has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors.

Sensitive, vulnerable, or critical uses may include:

- caravan parks
- eco-tourist facilities
- centre-based child care centres
- early education and care facilities
- correctional centres
- educational establishments
- emergency services facilities
- group homes
- boarding houses
- hostels
- hospitals
- residential care facilities
- respite day care centres
- seniors housing
- tourist and visitor accommodation.