

## Macquarie Rivulet Flood Study

### What is the 1%AEP flood event (100-year flood)?

A 1% AEP flood event (often referred to as the 100-year flood) is the flood that has a 1% probability of occurring in any given year. If you have experienced a 1% AEP flood event, it is still quite possible for you to experience another event of similar magnitude within your lifetime, as large flood events do occur randomly. Some parts of Australia have received two or three 1% AEP flood events within a few years of one another. On average, if you live to be 70 years old, you have a better than even chance of experiencing a 1% AEP flood event. The 1%AEP event plus freeboard is typically used to set Flood Planning Levels (FPL) for residential development.

### What is the Probable Maximum Flood (PMF)?

The PMF is the event used to define flood prone land. It is also the largest flood that could conceivably occur. It is typically estimated from probable maximum precipitation coupled with the worst flood producing catchment conditions. While it is a rare and improbable occurrence, every property potentially affected by the PMF is considered to have some element of flood risk. Under the State Government's *Floodplain Development Manual (2005)*, councils must model and consider the full range of floods up to the PMF.

It is important to note that in most locations, new development is able to be approved on flood prone land without additional planning controls as long as the land is above the Flood Planning Level.

### What is the history of flooding in Macquarie Rivulet?

The study area has a significant history of recurrent low magnitude flood events. Outside of the study area, the suburbs of Warilla, Flinders and Barrack Heights experienced extensive flooding in March 2011, in the order of a 1%AEP event. However, Albion Park and the surrounding upper catchment areas did not receive the same extent of rainfall during this event.

Significant flooding of Macquarie Rivulet did occur in 1991, 1984 and 1975. It is important to note that the catchment has not experienced flooding in the order of a 100-year event in living memory.

### What process does Council follow when managing the flood risk?

Under the NSW Government Flood Prone Land Policy, management of flood prone land is, primarily, the responsibility of councils. We are working with the NSW Office of Environment and Heritage and the Local Community to deliver and implement Floodplain Risk Management Plans. This process is part of our floodplain management program.

Our floodplain management program is carried out in accordance with the NSW Government's Floodplain Development Manual (2005). The formulation and implementation of floodplain risk management plans is the main goal of the floodplain management process. The process set out in the manual ensures consideration of economic, social and environmental costs of floods and the various options available to address the flood risk.

We receive financial and technical assistance from the NSW government as well as direction from Floodplain Management Committees setup for each study area. The Committees are formed to provide Council with representation from elected members of Council, Council staff with technical expertise, emergency management (SES), local infrastructure services, specialist consultants engaged by Council and members of the local community. The Committees are setup as a forum for discussion of

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technical, social, economic, environmental and cultural issues and ultimately are required to provide direction for the various studies and make recommendations to Council.

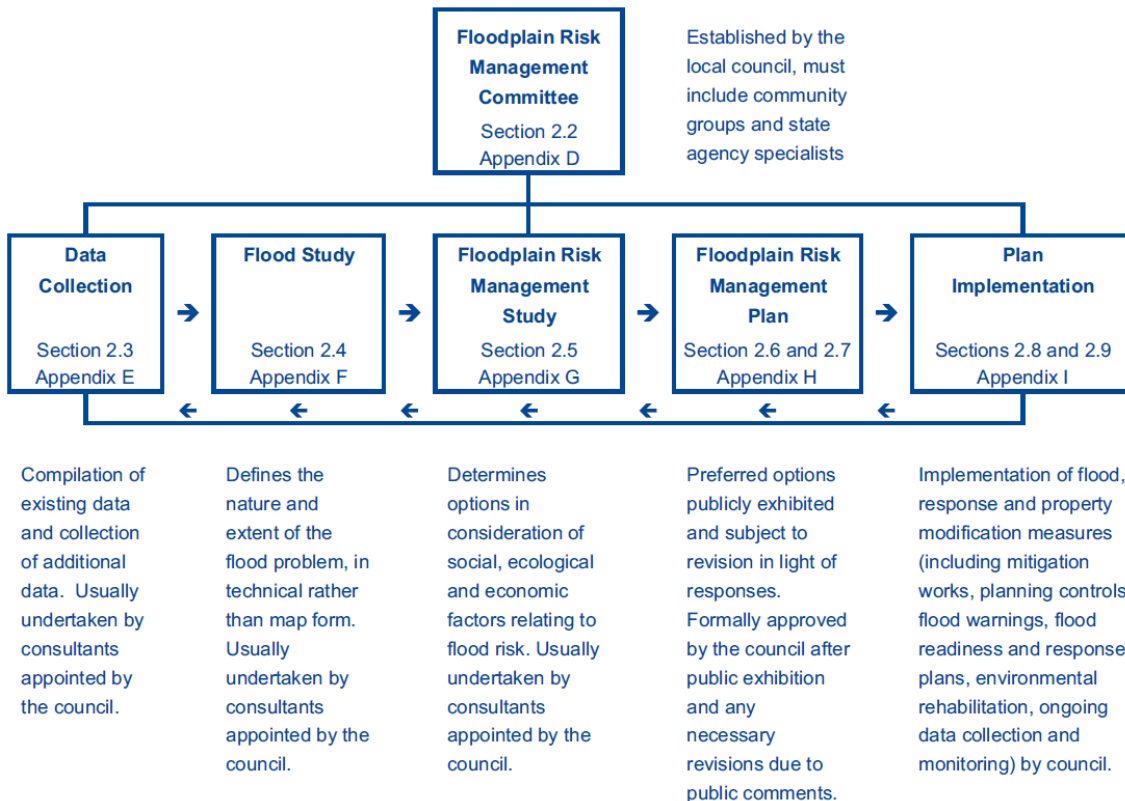


Figure 1: Floodplain Risk Management Process Diagram, NSW Floodplain Development Manual (2005)

Upon adoption of the flood study, the next stage for the Macquarie Rivulet catchment will be the preparation of a Floodplain Risk Management Study and Plan.

### Why do flood levels and information need to be reviewed over time?

Flood behaviour, including flood levels, velocities and hazard is calculated using detailed computer models to simulate floods of varying magnitudes. These models may be reviewed periodically when:

- new data becomes available from new flood events
- flood mitigation works are undertaken
- developments occur, and
- more advanced computer models become available.

### My property was never classified as 'flood prone' or 'flood liable' before. Why is it now classified as being flood affected?

Many parts of Shellharbour City have little or no flood data or records available at Council. Over time as new data is received and new flood studies are adopted by Council, more flood liable land will be identified and mapped accordingly. Also, under changes to the NSW Government's *Floodplain*

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*Development Manual* in 2005, flood liable land became inclusive of land that is affected by the Probable Maximum Flood (PMF). Before this only land inundated by the 100-year flood level was considered.

Up until now, a comprehensive catchment wide flood study for the greater Macquarie Rivulet Catchment has not been completed and adopted by Council. Rather a “patchwork” of flood studies have been undertaken over a number of decades to support development within the area.

If your property is now classified as flood prone, the real world flood risks to your property is not likely to have changed; only that new information is now available through the development of a comprehensive catchment wide flood study.

### **What impacts does the study have on Land Zoning?**

There are no automatic changes to your land zoning as a result of Council adopting new flood information. The zoning that applies to your land will still be that which is identified in the Local Environmental Plan. A Local Environmental Plan (LEP) is a legal document which allows Council to regulate land use and development. They are prepared by Council and approved by the State Government.

### **Can Flood Prone Land be developed?**

Flood prone land can be developed if the proposed development meets the relevant standards and requirements. These requirements are set out in the Shellharbour Development Control Plan, the State Environmental Planning Policy and in the NSW Floodplain Development Manual. The applicable planning controls are largely determined by the proposed land use, the extent of proposed development and the magnitude of the flood risk.

### **Will my property value be altered if my property is flood affected?**

Council's floodplain management program has been ongoing now for more than 15 years. Council first adopted a flood study for Lake Illawarra in 2001. A flood study was also adopted for Elliot Lake - Little Lake in 2006 and again for Horsley Creek in 2011. Concerns over effects on property values were raised from residents in these study areas, however no evidence has been presented to Council to suggest that there have been negative impacts on property values or development in these study areas in the past 15 years.

### **Will I be able to get house and contents insurance if my property is flood affected?**

Insurance is essentially a matter between the insurance company and the property owner and insurers are free to adopt Council's flood information or develop their own flood models for use in determining their risk. However, in 2012 a standard definition of flood was agreed upon by the insurance industry. This is now known as:

*The covering of normally dry land by water that has escaped or been released from the normal confines of:*

- any lake, or any river, creek or other natural watercourse, whether or not altered or modified; or
- any reservoir, canal, or dam.

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However, Insurance companies each have their own distinctive ways in which they calculate risk and determine insurance policy premiums. Many insurance companies will offer house and contents insurance, with each individual insurance company determining their own policy and conditions. Flood insurance premiums generally reflect the level of flood risk at a property and the cost of repairing or rebuilding the property. In practice, this can be broken down to three factors which would be assessed by all insurers when setting a flood premium for a property:

- Likelihood of flooding;
- Expected depth of flooding relative to the insured building; and
- Expected cost of recovery.

Likelihood and depth of flooding are assessed at an individual address level, using results from computer flood modelling which simulates how water flows through a catchment. Expected cost of recovery includes repair, rebuild and replacement costs, temporary accommodation, and other factors such as the potential shortage of materials and labour after a flood event. Some insurers may also consider property-specific information such as number of stories, floor levels, building materials used and construction type.

Insurance policies and conditions may change over time or between insurance companies, and you should confirm the specific details of your situation with your insurer. If you are having difficulty with your insurer, you naturally have the option of finding another insurer that meets your specific needs. You also have the option of approaching the Insurance Council of Australia (ICA), who can help you resolve your issues with your insurer.

### What catchment conditions were adopted in the study?

The flood model utilized a range of data collected throughout the study during 2012, 2013 and 2014 including LiDAR data (Aerial Laser Survey), ground survey, bathymetric survey and as-built structure data. Of this, the LiDAR data captured in 2011 was relied upon to represent topography changes outside of the major watercourses. During the course of the study, the 2011 LiDAR dataset was analyzed and ground truthed against data points across the catchment.

An extensive amount of field survey was gathered across the catchment and this field survey supplemented the LiDAR in the development of a Digital Elevation Model (DEM) used in the hydraulic model. The consultant followed an industry standard method appropriate for a catchment wide flood studies when building the hydraulic model.

Significant catchment changes within the study area, including those in Calderwood, Tullimbar and other new subdivisions and land release areas will be incorporated into the next stage of the Floodplain Management Process, being a Floodplain Risk Management Study and Plan. Areas where there has been significant change to the floodplain will be assessed and re-surveyed as part of the Floodplain Risk Management Study, and the flood model will be updated with his new information.

### How can I get specific flood level information for my property?

Council provides property specific flood level information for individual properties for use in helping land owners and developers understand their flood risk. A Flood Level Information Request Form can be obtained from Councils website and the Shellharbour City Council Customer Service Centre.