



FLOOD RISK MANAGEMENT POLICY

P1.0046.2

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PART 1 – POLICY INTRODUCTION

1 BACKGROUND

- 1.1. The Flood Risk Management Policy (the Policy) establishes flood risk management planning and development procedures for all flood prone land within the Camden Local Government Area (LGA). Flood prone land is land that is susceptible to flooding by the Probable Maximum Flood (PMF) event.
- 1.2. The Policy has regard to the requirements of the New South Wales Government Floodplain Development Manual (FDM).
- 1.3. The primary method of Flood Risk Management in the Camden LGA is through the floodplain risk management process as outlined in the FDM. The floodplain risk management process guides land use planning and application of development controls on flood prone lands as set out in this policy.
- 1.4. Camden LGA has two major catchments. They are the Upper South Creek Catchment and the Nepean River Catchment. These catchments drain to South Creek and Nepean River respectively and are shown in Figure 1 of Appendix 1.
- 1.5. Each of the two catchments are unique in its flood behaviour and so two different approaches have been adopted to account for the differences. Therefore, the Policy includes two separate sections which are specific to each catchment.
- 1.6. Narellan Creek Catchment is a sub catchment of Nepean River, and Narellan Creek is the major tributary of Nepean River in Camden LGA, as shown in Figure 2 of Appendix 1.
- 1.7. This Policy replaces the Camden Council Flood Risk Management Policy adopted on 10 April 2006.

2 PURPOSE

- 2.1. The purpose of this Policy is to ensure the risk to life and property from flooding due to development is minimised in a manner consistent with the NSW Flood Prone Land Policy and the FDM.
- 2.2. Camden Council (Council) has a duty of care to ensure that the development of flood affected properties is carried out in a reasonable and responsible manner and encourage the use of land which is compatible with the indicated flood hazard.
- 2.3. The development of an individual property needs to be balanced against the broader community expectations and physical constraints of the land. Council, through the development control process, seeks to manage development on flood prone land that minimises financial loss and personal risk to the community.

3 OBJECTIVE

The specific objectives of the Policy are to:

- Provide a mechanism for the responsible control of development on flood prone land;
- Ensure the safety of people and property from flood risk;
- Provide a detailed and user-friendly guide for flood prone lands for the preparation and assessment of development applications lodged under either the *State Environmental Planning Policy (Precincts - Western Parkland City) 2021*¹ or the Camden Local Environmental Plan 2010 (LEP); and
- To ensure a sustainable and holistic catchment wide approach is taken to development on flood prone land within the Upper South Creek Catchment and the Nepean River Catchment within the Camden LGA.

4 SCOPE

- 4.1. This Policy applies to all flood prone land in the Upper South Creek Catchment and the Nepean River Catchment within the Camden LGA. The Policy applies to all types of flooding, including mainstream flooding, major drainage and local overland flow paths.
- 4.2. The Policy applies to flood prone land identified in Council's most up-to-date flood studies and plans including any that are not currently identified on Council's Flood Information Maps.

¹ Formerly called State Environmental Planning Policy (Sydney Region Growth Centres) 2006

5 ABBREVIATIONS

AEP	Annual Exceedance Probability
AIDR	Australian Institute for Disaster Resilience
DCP	Development Control Plan
FDM	Floodplain Development Manual
FERP	Flood Emergency Response Plan
FPL	Flood Planning Levels
LEP	Local Environment Plan
LGA	Local Government Area
m	Metre
m³	Cubic Metre
m/s	Metres per second
NSW	New South Wales
PMF	Probable Maximum Flood
PMP	Probable Maximum Precipitation
SES	State Emergency Service

6 DEFINITIONS

The following definitions are applicable to this Policy. Additional definitions relating to specific catchments can be found in the corresponding sections.

The following general definitions are only applicable to a catchment if a catchment specific definition has not been determined or not provided in the corresponding sections.

Term	Definition
Annual Exceedance Probability (AEP)	The probability of an event occurring or being exceeded within a year, usually expressed as a percentage. For example, a 1% AEP flood has a 1% or 1 in 100 chance of occurring in any year.
Adverse flood impacts	Adverse flood impacts mean: <ul style="list-style-type: none"> • Increase in peak flood level • Increase in flood velocity • Increase in peak flows • Increase in hydraulic hazard • Increase in duration of flooding • Increase in duration access is cut • Decrease in warning or evacuation time
Catchment	The area draining to a site. It always relates to a particular location and may include the catchments of tributary streams as well as the mainstream.
Consent authority	The council, government agency or person having the function to determine a development application for land use under the <i>Environmental Planning and Assessment Act 1979</i> (EPA Act).
Design flood	A significant event to be considered in the design process; various works within the floodplain may have different design events e.g., some roads may be designed to be overtopped in the 1% AEP flood event.
Development	The erection of a building or the carrying out of work; or the use of land or of a building or work; or the subdivision of land.
Discharge	The rate of flow of water measured in terms of volume per unit time, for example, cubic metres per second (m ³ /s). Discharge is different from the speed or velocity of flow, which is a measure of how fast the water is moving for example, metres per second (m/s).

Effective warning time	The time available after receiving advice of an impending flood and before the floodwaters prevent appropriate flood response actions being undertaken. The effective warning time is typically used to move farm equipment, move stock, raise furniture, evacuate people and transport their possessions. In the urban context the effective warning time is typically used to raise or remove valuable goods and equipment and hazardous materials, and to evacuate people.
Emergency management	A range of measures to manage risks to communities and the environment. In the flood context it may include measures to prevent, prepare for, respond to and recover from flooding.
Engineer	A person with an Engineering qualification in an appropriate discipline obtained from a university and included in the National Engineering Register, administered by Engineers Australia.
Farm dam	Refers to above ground basins or informal storage facilities (detention bunds) located in the floodplain that temporarily, or permanently, store water.
Flood	Relatively high stream flow which overtops the natural or artificial banks in any part of a stream or river and/or local overland flooding associated with major drainage before entering a watercourse.
Flood compatible material	Those materials used in building which are resistant to damage when inundated. A list of flood compatible materials is provided in this Policy at Schedule 1 to Appendix 5.
Flood Emergency Management Response Plan (FERP)	A flood response strategy plan describes agreed roles, responsibilities, functions, strategies and management arrangements for all floods, in line with SES Camden Local Flood Plan and as explained in the FDM.
Flood fringe areas	The remaining area of land affected by flooding, after floodway and flood storage areas have been defined.
Flood planning area	The area of land below the FPL and thus subject to flood related development controls.
Flood Planning Levels (FPL)	Are the combinations of flood levels (derived from significant historical flood events or floods of specific AEPs) and freeboards selected for floodplain risk management purposes as determined in floodplain risk management studies and incorporated in floodplain risk management plans.
Flood prone land	Land susceptible to flooding by the PMF event. Flood prone land is synonymous with flood liable land. The term covers the whole of the floodplain.
Flood proofing	A combination of measures incorporated in the design, construction and alteration of individual buildings or structures, subject to flooding, to reduce or eliminate flood damages.

Flood storage areas	Those parts of the floodplain that are important for the temporary storage of floodwaters during the passage of a flood. The extent and behaviour of flood storage areas may change with flood severity, and loss of flood storage can increase the severity of flood impacts by reducing natural flood attenuation. Hence, it is necessary to investigate a range of flood sizes before defining flood storage areas.
Floodplain	Area of land which is subject to inundation by floods up to and including the PMF event, that is flood prone land.
Floodplain Development Manual	Supports the Flood Prone Land Policy and guides Councils through the floodplain risk management process. The manual, as amended from time to time, helps councils develop and implement local floodplain risk management plans and outlines the technical assistance provided by the NSW Government.
Floodway areas	Those areas where a significant volume of water flows during floods and are often aligned with naturally defined channels. They are areas that, even if only partially blocked, would cause a significant redistribution of flood flow, which may in turn adversely affect other areas. They are often, but not necessarily, areas of deeper flow or areas where higher velocities occur.
Freeboard	A factor of safety typically used in relation to the setting of floor levels, levee crest levels, etc. It is usually expressed as the difference between the adopted flood planning level and the flood used to determine the flood planning level. Freeboard provides a factor of safety to compensate for uncertainties in the estimation of flood levels across the floodplain, such as wave action, localised hydraulic behaviour and other effects such as climate change. Freeboard may be included in the flood planning level.
Habitable Floor Area	Residential (low, medium or high density): the floor area of a living or working area, such as a lounge room, dining room, rumpus room, kitchen, bedroom or workroom.
Hazard	<p>FDM 2005 Classification</p> <p>A source of potential harm or a situation with a potential to cause loss. In relation to this Policy the hazard is flooding which has the potential to cause damage to the community.</p> <p><u>High Hazard:</u></p> <p>Flood conditions that pose a possible danger to personal safety; evacuation by trucks difficult; able-bodied adults would have difficulty wading to safety; potential for significant structural damage to buildings.</p> <p><u>Low Hazard:</u></p> <p>Flood conditions such that should it be necessary, people and their possessions could be evacuated by trucks; able-bodied adults would have little difficulty wading to safety.</p> <p>AIDR Classification</p> <p>Flood hazard for flood events of different scales is classified into 6 categories. These are H1 to H6, which range from least to most hazardous conditions. Categories H1 to H4 are equivalent to low hazard and H4 to H6 equivalent to high hazard in the FDM 2005.</p>

Hazardous Material	Solids, liquids, or gases that can harm people, other living organisms, property, or the environment. These may include materials that are radioactive, flammable, explosive, corrosive, oxidizing, asphyxiating, bio-hazardous, toxic, pathogenic, or allergenic. Also included are physical conditions such as compressed gases and liquids or hot materials, including all goods containing such materials or chemicals, or may have other characteristics that render them hazardous in specific circumstances.
Local drainage	Smaller scale problems in urban area. They are outside the definition of major drainage.
Local overland flooding	Inundation by local runoff rather than overbank discharge from a stream, river, estuary, lake or dam.
Mainstream flooding	Inundation of normally dry land occurring when water overflows the natural or artificial banks of a stream, river, estuary, lake or dam. Mainstream flooding generally excludes watercourses constructed with pipes or artificial channels considered as stormwater channels.
Major drainage	<p>Councils have discretion in determining whether urban drainage problems are associated with major or local drainage. For the purposes of this Policy major drainage involves:</p> <ul style="list-style-type: none"> - the floodplains of original watercourses (which may now be piped, channelised or diverted), or sloping areas where overland flows develop along alternative paths once system capacity is exceeded; and/or - water depths generally in excess of 0.3m in the 1% AEP Event. These conditions may result in danger to personal safety and property damage to both premises and vehicles; and/or - major overland flow paths through developed areas outside of defined drainage reserves; and/or - the potential to affect a number of buildings along the major flow path.
Management plan	A document including, as appropriate, both written and diagrammatic information describing how a particular area of land is to be used and managed to achieve defined objectives. It may also include description and discussion of various issues, special features and values of the area, the specific management measures which are to apply and the means and timing by which the plan will be implemented.
Merit approach	The merit approach weighs social, economic, ecological and cultural impacts of land use options for different flood prone areas. It also considers potential flood damage, hazard and behaviour implications, as well as environmental protection and the well-being of the rivers and floodplains. The merit approach operates at two levels. At the strategic level it allows for the consideration of social, economic, ecological, cultural and flooding issues to determine strategies for the management of future flood risk. At a specific level, it involves consideration of the best way of conditioning development allowable under the floodplain risk management plan, local flood risk management policy and Environmental Planning Instruments.

Minor additions	An addition or alteration to an existing dwelling (residential / non-residential) of not more than 10% or 30m ² (whichever is the lesser) of the habitable floor area that comply with the definitions of concessional development.
Non-Habitable Floor Area	<p><u>Residential (low, medium or high density):</u></p> <p>Any area that does not classify as Habitable Area. See definition of Habitable Area.</p> <p><u>Industrial or Commercial:</u></p> <p>An area other than an area used to store valuable goods, materials and equipment, and hazardous materials susceptible to flood damage in the event of a flood.</p>
Overland Flow	The local runoff, travelling through properties and/or roads, before it discharges into a stream, river, estuary, lake or dam.
Peak discharge	The maximum discharge occurring during a flood event.
Probability	A statistical measure of the expected chance of flooding (see AEP).
Probable Maximum Flood (PMF)	The largest flood that could conceivably occur at a particular location, usually estimated from probable maximum precipitation. Generally, it is not physically or economically possible to provide complete protection against this event. The PMF defines the extent of flood prone land, that is, the floodplain.
Probable Maximum Precipitation (PMP)	The PMP is the greatest depth of precipitation for a given duration meteorologically possible over a given size storm area at a particular location at a particular time of the year, with no allowance made for long-term climatic trends (World Meteorological Organisation, 1986). It is the primary input to PMF estimation.
Risk	The chance of something happening that will have an impact. It is measured in terms of consequences and likelihood. In the context of the FDM, it is the likelihood of consequences arising from the interaction of floods, communities and the environment.
Runoff	The amount of rainfall that actually ends up as stream or pipe flow, also known as rainfall excess.
Structure	Structure means any works such as but not limited to buildings, walls, bridges, infrastructure, etc. in the floodplain.

7 GENERAL INFORMATION

General flooding information is available via Council's website. This includes access to various documents including this Policy, the FDM, Flood Studies and maps, Frequently Asked Questions (FAQs) and other useful information.

Council also provides specific services regarding flood information for properties which can be obtained online or through the Customer Service Section of Council.

7.1 Section 10.7 Planning Certificates

All Councils have statutory responsibility for land use planning and management under the EPA Act for their LGA. Property information provided on planning certificates issued by Councils under section 10.7 of the EPA Act facilitates awareness of constraints and restrictions on the land.

In areas where Council holds flood related information, the section 10.7 planning certificate shall indicate whether the land is affected by flooding and subject to flood related development controls or not, based on Council's up-to-date flood studies and plans with additional information provided where appropriate.

7.2 Flood Certificates

For further flood related information or restrictions for a property a Flood Certificate can be obtained from Council. This certificate provides a more detailed set of information such as flood levels, FPLs, velocities, depths, hydraulic categories and hazard categories, etc. (subject to information availability).

7.3 Land Use Categories

Different land uses experience different risks from flooding. Consequently, land uses have been grouped into major land use categories based on their sensitivity to flood risks as follows.

7.3.1 Critical Infrastructure

Includes emergency services facilities such as: health services facilities; administration buildings or public administration buildings that may be important for the notification or evacuation of the community during flood events (e.g., SES Headquarters, Police Stations, Ambulance Stations, Evacuation Centres).

7.3.2 Sensitive Uses and Facilities

Includes community facilities that would provide services to sensitive persons such as children and seniors during floods or if inundated would unreasonably affect the ability of the community to return to normal activities after flood events. May include seniors housing; childcare centres; aged care centres; schools; liquid fuel depots; public utilities (including electricity generating works and utility installations).

7.3.3 Precinct Planning and Land Subdivision

Refers to the subdivision of land for the purpose of urban development. This definition also encompasses the subdivision of land in Urban Release Areas where multiple land uses are proposed.

7.3.4 Low Density Residential

Includes dwelling houses, rural workers' dwellings, secondary dwellings, exhibition home, exhibition village, home-based childcare, home business, home industry, home occupation and caravan parks (approved long-term sites).

7.3.5 Medium and High Density Residential

Includes dual occupancies, attached dwellings, boarding houses, multi dwelling housing, residential flat buildings, semi-detached dwellings, shop top housing, hostels, and community facilities.

7.3.6 Commercial and Industrial

Commercial and industrial development is only permitted in areas located outside the floodways mapped as shown at Council's website,

[Floodways.pdf \(nsw.gov.au\)](#)

7.3.7 Concessional Development

Concessional development is only permitted in areas located outside the floodways mapped as shown at Council's website,

[Floodways.pdf \(nsw.gov.au\)](#)

Concessional development is listed under following two categories.

Concessional development in the case of commercial and residential (low, medium or high density) development:

- A single habitable addition or alteration only to an existing dwelling of not more than 10% or 30 m² (whichever is the lesser) of the habitable floor area which existed at the date of commencement of this policy. No further habitable additions are permitted as concessional development, and further development must comply with the applicable controls for relevant land use categorisation. No additions are permitted, as concessional development, if a one-off addition has been approved under any previous policy; or
- The construction of a single non-habitable outbuilding only with a maximum floor area of 30 m². No further non-habitable outbuildings are permitted as concessional development, further development must comply with the applicable controls for relevant land use

categorisation. No additions are permitted if a one-off addition has been approved under any previous policy; or

- Rebuilding a dwelling that substantially reduces the extent of flood affectation to the rebuilt building; and

Concessional development in the case of other development:

- Rebuilding of a development which substantially reduces the extent of flood risks to the rebuilt development; or
- A change of use which does not increase flood risk having regard to property damage and personal safety; and
- A subdivision that does not involve the creation of new allotments with potential for further development.

7.3.8 Rural and Recreation

Reference to the construction of farm sheds and non-habitable outbuildings. Includes animal boarding establishment; agricultural facility; biosolid waste application; biosolids treatment facility; caravan park (with no approved long term sites and no “annuals”) short term sites, camping grounds; environmental facility; environmental protection works; information facility; horticulture; kiosk; landscape and garden supplies; recreation area; recreation facility; research station; water recreation structure; water recycling facility and water storage facility and flood mitigation works.

PART 2 - UPPER SOUTH CREEK: DEVELOPMENT CONTROLS

8 LAND TO WHICH PART 2 APPLIES

Part 2 of this Policy applies to any development for which consent is required that is located on land affected by flooding (flood prone land) within the Upper South Creek Catchment as identified in Council's up-to-date flood study/Plan.

9 FLOOD MAPPING

Due to ongoing development in this Catchment, flood behaviour will potentially be subject to changes with the development. Accordingly, flood mapping will be reviewed and updated frequently.

Based on Council's future frequent revisions of flood studies and/or flood risk management studies and plans, the flood mapping will be updated at Council's website following the standard floodplain risk management process, including public exhibition of the revised Studies and/or Plans.

9.1 Flood Behaviour (Extents, Levels, Depths and Velocities)

The extent of inundation, flood levels, flood depths and velocities for a range of flood events for the Upper South Creek Catchment mainstream flooding and overland flooding as identified in Council's up-to-date Flood Study/Plan are available at Council's website,

[USC-Flood-Study-Flood-Mapping-Appendix-C.pdf](#)

The above information for a specific development is available from Council as part of a flood information report.

9.2 Flood Risk Precincts

The Flood Risk Precincts are determined through the flood risk management process as identified in Council's up-to-date Flood Study/Plan. The Flood Risk Precinct Map defines High, Medium and Low Flood Risk Precincts as well as overland flow paths. The Flood Risk Precincts map can be used to identify the flood risk precinct for individual properties within the Study Area. This map is to be used in the preparation and assessment of development in the Catchment.

The Flood Risk Precinct Map is available at Council's website,

[Updated-Upper-South-Creek-Flood-Risk-Precincts.pdf \(nsw.gov.au\)](#)

The above information for a specific development is available from Council as part of the flood information report.

9.3 **Hydraulic Categories**

The hydraulic categories are determined through the flood risk management process as identified in Council's up-to-date Flood Study/Plan. The hydraulic categories map defines floodways, flood storage areas and flood fringe area and is available at Council's website,

[Updated-Upper-South-Creek-Hydraulic-Categories.pdf \(nsw.gov.au\)](#)

This mapping is available from Council as part of the flood information report for a specific development.

9.4 **Addressing Climate Change Impacts**

Climate change impacts have been assessed. The flood level increases at 1% AEP event are approximately 100mm in average. It is considered that the climate change impacts of flood level increase up to 100mm at 1% AEP can be accommodated in current freeboard.

9.5 **Flood Planning Area Mainstream**

The FPA for mainstream flooding is determined through the flood risk management process and based on the 1% AEP design flood event as identified in Council's up-to-date Flood Study/Plan.

A freeboard as identified in Council's up-to-date Flood Study/Plan above the 1% AEP flood level applies to mainstream flooding.

The Flood Planning Area Map for Mainstream flooding is available at Council's website,

[Updated-Upper-South-Creek-Flood-Planning-Area.pdf \(nsw.gov.au\)](#)

9.6 **Flood Planning Area Overland Flow**

The FPA for areas affected by 1% AEP flooding outside the mainstream flooding extent is determined through the flood risk management process as identified in Council's up-to-date Flood Study/Plan.

A freeboard as identified in Council's up-to-date Flood Study/Plan above the 1% AEP flood level applies to the overland flow path.

The FPA Map for Overland Flow is available at at Council's website,

[Updated-Upper-South-Creek-Flood-Planning-Area.pdf \(nsw.gov.au\)](#)

10 FLOOD RISK MANAGEMENT DEVELOPMENT CONTROLS

10.1 The Development Control Matrix

The Development Control Matrix for the Upper South Creek Catchment provides a correlation of the land use categories, applicable controls, and risk management measures to be followed in the preparation and assessment of development in the Catchment.

The Development Control Matrix and relevant development controls are given in Appendix 2.

PART 3 – NEPEAN RIVER: DEVELOPMENT CONTROLS

11 LAND TO WHICH PART 3 APPLIES

Part 3 of this Policy applies to any development for which consent is required that is located on land affected by flooding (flood-prone land) within the Nepean River Catchment including its tributaries located within the Camden LGA, as identified in Council's up-to-date Flood Study/Plan.

12 FLOOD MAPPING

12.1 Flood Behaviour (Extents, Levels, Depths and Velocities)

The extent of inundation, flood levels, flood depths and velocities for a range of flood events for the Nepean River Catchment mainstream flooding and overland flooding as identified in Council's up-to-date Flood Study/plan are available at NSW Flood Data Portal,

[Nepean River Floodplain Risk Management Study and Plan - Report - Appendix B Combined - NSW Flood Data Portal](#)

The above information for a specific development is available from Council as part of the flood information report.

12.2 Hydraulic Categories

The hydraulic categories are determined through the flood risk management process as identified in Council's up-to-date Flood Study/Plan. The hydraulic categories map defines floodways, flood storage areas and flood fringe area.

The Flood Hydraulic Categories Maps are available at Council's website,

[Nepean-River-Hydraulic-Categories.pdf \(nsw.gov.au\)](#)

This mapping is available from Council's flood information report for a specific development.

12.3 Flood Risk Precincts Mapping

The Flood Risk Precinct maps for the Nepean River catchment mainstream flooding and overland flow are determined through the flood risk management process as identified in Council's up-to-date Flood Study/Plan.

The Flood Risk Precinct maps are available at Council's website,

[Nepean-River-Flood-Risk-Precincts.pdf \(nsw.gov.au\)](#)

This mapping is available from Council's flood information report for a specific development.

12.4 Addressing Climate Change Impacts

Potential impacts from climate change were assessed by modelling the flood behaviour arising from increase in rainfall intensities through the flood risk management process as identified in Council's up-to-date Flood Study/Plan. The results showed that the Nepean River catchment is prone to large flood level increases as a result of the increased rainfall intensities from climate change. Under the climate change scenario, the flood levels increased by up to and over 1.5m within the catchment.

12.5 Flood Risk Mapping considering Climate change for Zone B

Based on the significance of climate change impacts, the mainstream floodplain up to the 1% AEP has been classified as Zone A and Zone B, as identified in Council's up-to-date Flood Study/Plan.

The extent of Zone A and Zone B are mapped and available at Council's website,

[Climate-change-Zone-A-and-Zone-B.pdf \(nsw.gov.au\)](#)

For Zone A, Flood Risk Precinct maps for current conditions should be used for development. The Flood Risk Precinct maps for current conditions are provided in Council's up-to-date Flood Study / Plan, available at Council's website,

[Zone-A-Nepean-River-Flood-Risk-Precincts.pdf \(nsw.gov.au\)](#)

For Zone B, climate change should be considered in development using Flood Risk Precinct maps for the climate change scenario as provided in Council's up-to-date Flood Study/Plan, available at Council's website,

[Zone-B-Nepean-River-Climate-Change-Flood-Risk-Precincts.pdf \(nsw.gov.au\)](#)

This mapping is available from Council's flood information report for a specific development.

12.6 Flood Planning Area Mainstream

The FPA for mainstream flooding is determined through the flood risk management process and based on the 1% AEP event as identified in Council's up-to-date Flood Study/Plan.

The FPA Maps for Mainstream flooding are available at Council's website,

[Nepean-River-mainstream-Flood-Planning-Area.pdf \(nsw.gov.au\)](#)

A freeboard as identified in Council's up-to-date Flood Study/Plan above the 1% AEP flood level applies to mainstream flooding.

For Zone A, a freeboard as identified in Council's up-to-date Flood Study/Plan above the 1% AEP flood level applies to mainstream flooding.

For Zone B, a freeboard as identified in Council's up-to-date Flood Study/Plan above the climate change 1% AEP flood level applies to mainstream flooding.

12.7 Flood Planning Area Overland Flow

The FPA for areas affected by 1% AEP flooding outside the mainstream flooding extent is determined through the flood risk management process as identified in Council's up-to-date Flood Study/Plan.

A freeboard as identified in Council's up-to-date Flood Study/Plan above the 1% AEP flood level applies for the overland flow paths in High Flood Risk Precinct.

The FPA Maps for Overland Flow are available at Council's website,

[Nepean-River-overland-flow-Flood-Planning-Area.pdf \(nsw.gov.au\)](https://www.nsw.gov.au/nepean-river-overland-flow-flood-planning-area)

13 FLOOD RISK MANAGEMENT DEVELOPMENT CONTROLS

13.1 The Development Control Matrix

The Development Control Matrix for the Nepean River Catchment including Narellan Creek provides a correlation of the land use categories, applicable controls, and risk management measures to be followed in the preparation and assessment of development in the Catchment.

The Development Control Matrix and relevant development controls are given in Appendix 3.

APPENDICES

APPENDIX 1 - FIGURES

Figures 1 and 2 are available at Council's website:

[Appendix 1 – Figures.pdf \(nsw.gov.au\)](#)

APPENDIX 2 – UPPER SOUTH CREEK DEVELOPMENT CONTROLS

1 FLOOD RISK MANAGEMENT DEVELOPMENT CONTROLS

1.1 Floodplain Development Control Matrix

The Floodplain Development Control Matrix for Upper South Creek given in Matrix 1, below, provides a correlation of the land use categories, applicable controls, and risk management measures to be followed in the preparation and assessment of development in the Catchment. The numbers in the matrix refer to those included in the Development Controls below.

1.1.1 Freeboard

Freeboard means 500 mm above the 1% AEP flood level for the mainstream Low to High Flood Risk Precincts and 300 mm for the Overland Flow Precinct.

1.2 Development Controls

1.2.1 Floor Levels

- 1) FPL for habitable floor levels is the 1% AEP flood level plus freeboard.
- 2) FPL for non-habitable floor levels is the 1% AEP flood level with no freeboard.
- 3) FPL for sensitive uses is the PMF flood level with no freeboard.
- 4) Where garages, sheds and minor additions are proposed, floor levels lower than the above FPLs may be considered in cases that comply with the definitions of concessional development. The highest practical floor level is to be designed in all cases, except in the case of minor additions where the existing floor level is to be maintained at a minimum.

1.2.2 Building components

- 1) Any part of a building, services, foundations and/or sub-structure located below the applicable FPL is to be constructed of flood compatible materials.
- 2) Parts of a structure/building and its services, foundations and/or sub-structure are to be constructed of flood compatible materials below the 1% AEP flood level.
- 3) All parts of a sensitive uses building are to be constructed of flood compatible materials below the level of the PMF.

Note: Refer to Schedule 1 of Appendix 5 for flood compatible materials. Schedule 2 of Appendix 5, concerning electrical and mechanical equipment installations, applies to all buildings.

1.2.3 Structural Soundness

- 1) A structural engineering report is to be provided to ensure the structures can withstand floodwater forces including debris and buoyancy up to the 1% AEP plus freeboard or the PMF whichever is higher, where a flood refuge or evacuation access is proposed.

- 2) Applicant to demonstrate that the structure can withstand floodwater forces including debris and buoyancy up to the PMF. An engineer's report will be required.

1.2.4 Flood Affection

- 1) Engineering report required to certify that development will not increase flood affection elsewhere, having regard to: a) loss of flood storage; b) changes in flood levels, flows and velocities upstream, downstream and adjacent to the site; c) cumulative impact of multiple development in the vicinity; and d) negligible impact to flood hazard. A flood impact and risk assessment report is to be prepared based on flood modelling, where precinct developments are proposed or where sub-divisions increase the intensity of land use in the floodplain.
- 2) No importation of fill within any part of the 1% AEP floodplain. Floodplain filling is only permitted in the 1% AEP floodplain fringe, and flood storage with zero net filling, where flood modelling is conducted to demonstrate there is no adverse flood impacts elsewhere / off site.
- 3) The flood impact of the development is to be considered having regard to: a) loss of flood storage; b) changes in flood levels, flows and velocities upstream, downstream and adjacent to the site; c) cumulative impact of multiple development in the vicinity; and d) negligible impact to flood hazard as a result of development. A flood impact and risk assessment report is to be prepared based on flood modelling.
- 4) Removal of farm dams is only permitted where the removal does not cause adverse flood impacts off-site. Demonstration of no adverse impacts to flood levels, peak flows, flood velocity and redirection of flow is required by flood modelling. This applies for single lots greater than 10 hectares or single lots of all sizes where multiple single lot developments are proposed.

Note: For the above controls 1 to 4, it is required to use Council's 1D/2D Upper South Creek Regional Flood Model and User Guide prepared as part of Council's up-to-date flood studies / plans. The Regional Flood Model and User Guide are to be provided by Council. The User Guide facilitates the assessment of flood impacts and risk of the development. The flood impact and risk assessment report is to be prepared by an engineer.

1.2.5 Emergency Management

- 1) Appropriate methods of reaching safety from flood waters during the PMF are to be demonstrated for habitable buildings in accordance with the Local Flood Plan or SES flood emergency management plan for the area. An engineer's report will be required.
- 2) Engineer's report is to be provided in accordance with Local Flood Plan or SES flood emergency management plan for the area demonstrating that permanent, failsafe, maintenance free measures are incorporated into the development so the occupants can either take refuge or evacuate from floodwaters in the case of events up to the PMF. A report is to be prepared by a suitably qualified engineer having regard to safe warning time, rate of rise and safe velocity and depth thresholds for evacuation by pedestrians and vehicles where evacuation is proposed.
- 3) A FERP is to be developed by the business director/manager, in conjunction with Council and the SES, with adequate documentation (signs) of the plan to be displayed around the premises. The FERP is to be updated every 2 years.

- 4) If the property is affected by the 1% AEP flood level, reliable access to a flood free refuge is to be provided for pedestrians and vehicles.

1.2.6 Car Parking

- 1) Where basement car parking is proposed, the entry level is to be the 1% AEP plus freeboard or the PMF whichever is higher.
- 2) Where basement car parking is proposed, the entry level is to be the 1% AEP plus freeboard. If the level of the PMF is higher than the proposed entry level, a FREP is to be provided to manage flood risk in the car park.
- 3) Above ground car parks and garages are to be at a minimum level of 150mm below the 1% AEP flood level.
- 4) Above ground car parking including carports are to be at the highest level practical and not more than 300mm below the 1% AEP flood level. Enclosed garages are to be at the highest level practical and not more than 300mm below the 1% AEP.

1.2.7 Management and Design

- 1) Provision of adequate emergency response information and advice to residents, employees, attendants, guests and /or visitors.
- 2) Applicant to demonstrate that potential development as a consequence of the subdivision can be undertaken in accordance with Council's Flood Risk Management Policy.
- 3) Applicant to demonstrate that storage is available for goods above the 1% AEP level plus freeboard.
- 4) Applicant to demonstrate that storage is available for goods above the level of the PMF.

All development must provide for suitable storage of valuable goods, and goods susceptible to flood damage, above the FPL. This can be on or off site. Where storage is proposed off site, it must be demonstrated that relocation of valuable goods can be realistically achieved in the lead up to and during flood events with reference to the amount of warning time prior to floods, availability of flood free routes of travel and methods of transport required.

APPENDIX 3 – NEPEAN RIVER DEVELOPMENT CONTROLS

1 FLOODPLAIN RISK MANAGEMENT DEVELOPMENT CONTROLS

1.1 Floodplain Development Controls Matrix

The Floodplain Development Control Matrix provides a correlation of the land use categories, applicable controls and risk management measures to be followed in the preparation and assessment of development in the Nepean River catchment and its tributaries. The numbers in the matrix refer to the requirements listed in the Development Controls below.

The Floodplain Development Controls Matrix for mainstream and the Floodplain Development Controls Matrix for overland flow are given in Matrix 2 and Matrix 3, below, respectively.

1.2 Flood Planning Level

For Zone A and Zone B:

Mainstream flooding - A freeboard of 500mm above the 1% AEP flood level applies to mainstream flooding Low to High Flood Risk Precincts.

Overland Flow Paths - A freeboard of 500mm above the 1% AEP flood level applies for the overland flow paths in High Flood Risk Precincts.

For Zone B (Greenfield Developments including future transport infrastructure):

Mainstream flooding - A freeboard of 500mm above the climate change 1% AEP flood level (i.e., 1% AEP level plus 10% rainfall increase) applies to mainstream flooding Low to High Flood Risk Precincts, using Flood Risk Precinct maps for the climate change scenario.

Overland Flow Paths - A freeboard of 500mm above the 1% AEP flood level applies for the overland flow paths in the High Flood Risk Precincts.

1.3 Development Controls

1.3.1 Floor Levels

- 1) Habitable floor levels are to be no lower than the applicable FPL.
- 2) Non-habitable floor levels are to be no lower than the applicable 1% AEP flood level with no freeboard.
- 3) Habitable floor levels are no lower than the PMF level with no freeboard.
- 4) Where garages, sheds and minor additions are proposed, floor levels lower than the above (1.3.1. 1 and 2) may be considered in cases that comply with the definitions of concessional development. The highest practical floor level is to be designed in all cases, except in the case of minor additions where the existing floor level is to be maintained at a minimum.

- 5) Non-habitable floor levels are to be at the applicable 1% AEP flood level with no freeboard. Where this is not possible, floor levels should be as high as practical with consideration of the environs / adjacent development. The applicant must demonstrate why a non-habitable floor level at or higher than the 1% AEP floor level cannot be achieved.

1.3.2 Building Components

- 1) Any part of a building, services, foundations and/or sub-structure located below the applicable FPL is to be constructed of flood compatible materials.
- 2) All parts of a sensitive uses building are to be constructed of flood compatible materials below the level of the PMF.

Note: Refer to Schedule 1 of Appendix 5 for flood compatible materials. Schedule 2 of Appendix 5, concerning electrical and mechanical equipment installations, applies to all buildings.

1.3.3 Structural Soundness

- 1) A structural engineering report is to be provided that demonstrates the structure(s) can withstand floodwater forces including debris and buoyancy up to the applicable FPL.
- 2) A structural engineering report is to be provided that demonstrates the structure(s) can withstand floodwater forces including debris and buoyancy up to the PMF.

1.3.4 Flood Affectation

- 1) An engineering report is to be submitted that demonstrates that development is outside the floodway and will not increase the flood affectation outside of the development site, having regard to: a) loss of flood storage; b) any significant changes in flood levels, peak flows and velocities upstream, downstream and adjacent to the site; and c) any significant impacts on flood hazards.

Consideration should be also given to the cumulative impact of multiple developments in the vicinity if applicable.

In addition, compensatory flood storage for any loss of flood storage is to be provided in a flood storage area.

A site-specific flood impact and risk assessment report must be prepared using either the appropriate Council flood model for the relevant catchment, or an alternative proposed 2D model, agreed with the Council.

- 2) The development must be outside the floodway and flood impact of the development is to be considered having regard to: a) loss of flood storage; b) any significant changes in flood levels, peak flows and velocities upstream, downstream and adjacent to the site; and c) any significant impacts on flood hazards.

In addition, compensatory flood storage for any loss of flood storage is to be provided in a flood storage area.

An engineering report on flood impact and risk assessment is to be submitted.

1.3.5 Emergency Management

- 1) Appropriate methods of reaching safety from floodwaters during the PMF are to be demonstrated with reference to the emergency management strategy for the wider Nepean River floodplain. An engineer's report is required.
- 2) A FERP is to be developed by the business director/manager or property owner/manager, with consideration of the SES Camden Local Flood Plan and the emergency management strategy for the wider Nepean River floodplain. The FERP is to be updated every 2 years. The FERP is to be supported by signage which describes how to respond to a flood, and which is displayed prominently around the premises.
- 3) Council may consider the impacts of cumulative increases in the number of persons at risk as a result of the development and the impact this may have on evacuation capacity. An assessment of the impact of the evacuation capacity may be required to ensure that the additional persons on the site as a result of the development are able to be appropriately and safely evacuated during floods.

1.3.6 Car Parking

- 1) Where basement car parking is proposed, the entry crest level is to be no lower than the applicable FPL. If the level of the PMF is higher than the proposed entry crest level, a FERP is to be provided that demonstrates how flood risk in the car park will be managed.
- 2) The level of above-ground car parking and of garages are to be no lower than 150mm below the applicable 1% AEP flood level.
- 3) In cases where Requirement 2 is not achievable, above-ground car parking including carports and garages are to be set at the highest level practical. The exit from the car park should be located at the highest access point on the site boundary.
- 4) Above-ground car parking including carports and garages are to be set at the highest level practical.

1.3.7 Management and Design

- 1) Adequate emergency response information and advice is to be provided to residents, employees, attendants, guests and /or visitors at all times.
- 2) Applicant to demonstrate that any development resulting from a subdivision can be undertaken in accordance with Camden Council's Flood Risk Management Policy.
- 3) Applicant to demonstrate that hazardous storage is available for goods above the applicable FPL.
- 4) Applicant to demonstrate that hazardous and emergency storage is available for goods above the level of the PMF.
- 5) Ground levels for new release subdivisions should be higher than the applicable 1% AEP flood level. A flood impact assessment is to be submitted that demonstrates that any flood impacts on any adjoining properties are negligible.
- 6) Floodplain mapping is to be updated for the precinct development in the form of flood extents, flood levels, flood depths, flood velocities, provisional hazards, hydraulic categories and the extents of the flood planning area. Flood risk precincts are to be amended to reflect the development scenario using the same method as was used to delineate the flood risk precincts.

- 7) If the land subdivision changes from precinct planning, floodplain mapping is to be updated for the precinct development in the form of flood extents, flood levels, flood depths, flood velocities, provisional hazards, hydraulic categories and the extent of the flood planning area. Flood risk precincts are to be amended to reflect the development scenario using the same method as was used to delineate the flood risk precincts.
- 8) All development must provide for suitable storage of valuable goods, and goods susceptible to flood damage, above the FPL. This can be on or off site. Where storage is proposed off site, it must be demonstrated that relocation of valuable goods can be realistically achieved in the lead up to and during flood events with reference to the amount of warning time prior to floods, availability of flood free routes of travel and methods of transport required.

Matrix 2 - Nepean River Catchment - Mainstream Flooding

Floodplain Development Controls Matrix

Mainstream Flooding

			Floor Level	Building Components	Structural Soundness	Flood Affection	Emergency Management	Car Parking	Management & Design
Flood Risk Precincts	High Flood Risk	Critical Infrastructure and Facilities							
		Sensitive Uses and Facilities							
		Precinct Planning & Land Subdivision							
		Low Density Residential							
		Medium and High Density Residential							
		Commercial and Industrial Uses							
		Concessional Development	1,4	1	1	1	1,2,3	1,4	1,3
		Rural & Recreation	1,5	1	1	1	1	1,4	1,3
	Medium Flood Risk	Critical Infrastructure							
		Sensitive Uses and Facilities							
		Precinct Planning & Land Subdivision				1	1,3		2,5,6,7
		Low Density Residential	1,2	1	1	2	1	1,2,3	
		Medium and High Density Residential	1,2	1	1	1	1,2	1,2,3	1
		Commercial and Industrial Uses	1,2	1	1	1	1,2,3	1,2,3	1,3,8
		Concessional Development	1,4,	1	1	2	1,2,3	1,4	1,3
		Rural & Recreation	1,5	1	1	2	1,2	1,4	1,3
	Low Flood Risk	Critical Infrastructure							
		Sensitive Uses and Facilities	3	2	2	2	1	1	1,4
		Precinct Planning & Land Subdivision				1	1		2,6,7
		Low Density Residential					1		
		Medium and High Density Residential					1,2		1
		Commercial and Industrial					1,2,3	1	1,8
		Concessional Development					1,2,3		1
		Rural & Recreation					1,2	1	1

Colour Legend

	Unsuitable land use
	No Controls
	1,2 Flood related controls apply

Matrix 3 – Nepean River Catchment - Overland Flow

Floodplain Development Controls Matrix		Overland Flooding							
		Floor Level	Building Components	Structural Soundness	Flood Affection	Emergency Management	Car Parking	Management & Design	
Flood Risk Precincts	High Flood Risk	Critical Infrastructure and Facilities							
		Sensitive Uses and Facilities							
		Precinct Planning & Land Subdivision							
		Low Density Residential							
		Medium and High Density Residential							
		Commercial and Industrial Uses							
		Concessional Development	1,4	1	1	1	1,2	1,4	1,3
		Rural & Recreation	1,5	1	1	1	1	1,4	1,3
	Low Flood Risk	Critical Infrastructure							
		Sensitive Uses and Facilities							
		Precinct Planning & Land Subdivision				1	1,3		2,5,6,7
		Low Density Residential	1,2	1	1	2	1	1,2,3	
		Medium and High Density Residential	1,2	1	1	1	1,2	1,2,3	1
		Commercial and Industrial Uses	2	1	1	1	1,2,3	1,2,3	1,3, 8
Concessional Development		1,4	1	1	2	1,2	1,4	1, 3	
Rural & Recreation		1,5	1	1	2	1,2	1,4	1,3	

Colour Legend

	Unsuitable land use
	No Controls
	1,2 Flood related controls apply

APPENDIX 4 – GENERAL NOTES

1. FENCING

All fencing on land below the 1% AEP flood level must be of a form that:

- does not result in the undesirable obstruction of the free flow of floodwaters; and
- does not become unsafe during floods and potentially become moving debris which threatens the integrity of structures or the safety of people.

No fencing will be allowed across, over or through watercourses, drainage easements and overland flow paths.

2. ON-SITE SEWAGE MANAGEMENT

On sites where required, on-site sewage management systems must be installed and operated to comply with Council's Sewage Management Policy. A copy of the Sewage Management Policy is available on Council's website,

<https://www.camden.nsw.gov.au/assets/Uploads/On-Site-Sewage-Management-Policy.pdf>

Council has prescribed performance standards when determining applications for approval to install, construct, alter or operate sewage management systems. The *Local Government (General) Regulation 2021* specifies the minimum standards.

No portion of the sewage management system (i.e., treatment tanks, electrical pumps etc.) is permitted to be below the 1% AEP flood level. No portion of the irrigation area, absorption or evapo-transpiration area is permitted to be located below the 5% AEP flood level or within 100 metres of a permanent water course (river, stream, lake) or 40 metres of other waters (farm dams, intermittent waterways and drainage channels).

APPENDIX 5 – SCHEDULES

SCHEDULE 1 – FLOOD COMPATIBLE MATERIALS

To prevent or minimise structural damage from flooding, developments should be designed to withstand inundation, debris and buoyancy forces. Particular methods of construction and certain types of materials are better able to withstand inundation better than others. Suggested flood compatible materials are provided in this schedule.

Building Component	Flood Compatible Material
Flooring and Sub-Floor Structure	<ul style="list-style-type: none"> • Pier and beam constructions; • Suspended reinforced concrete slab.
Floor Coverings	<ul style="list-style-type: none"> • Clay tiles; • Concrete, precast or insitu; • Epoxy, formed in place; • Mastic flooring, formed in place; • Silicone floors formed in place; • Vinyl sheets or tiles with chemical set adhesives; • Ceramic tiles, fixed with mortar or chemical set adhesive; • Asphalt tiles, fixed with water resistant adhesive; • Removable rubber backed carpet.
Doors	<ul style="list-style-type: none"> • Solid panel with water proof adhesives; • Flush door with marine ply filled with closed cell foam; • Painted metal construction; • Aluminium or galvanised steel frame.
Wall and Ceiling Linings	<ul style="list-style-type: none"> • Brick, face or glazed; • Clay tile glazed in waterproof mortar; • Concrete; • Concrete block; • Steel and waterproof applications; • Stone, natural solid or veneer, waterproof grout; • Glass blocks; • Glass; • Plastic sheeting or wall with waterproof adhesive.

Wall Structure	<ul style="list-style-type: none"> • Solid brickwork. blockwork, reinforced concrete or mass concrete.
Windows	<ul style="list-style-type: none"> • Aluminium frame with stainless steel rollers or similar corrosion and water resistant material.
Insulation	<ul style="list-style-type: none"> • Foam, closed cell types.
Nails, Bolts, Hinges and Fittings	<ul style="list-style-type: none"> • Galvanised, stainless steel, brass, nylon; • Removable pin hinges.

SCHEDULE 2 - REQUIREMENTS FOR ELECTRICAL AND MECHANICAL EQUIPMENT / HEATING AND AIR CONDITIONING

Special consideration should be given to the design and siting of electrical and mechanical equipment installations in all cases of development on flood prone land. All electrical installations must comply with the requirements noted in the relevant development control matrix, and of the utility service providers. Further guidelines are provided in the table below. All electrical equipment is required to be at or above the FPL.

Type	Requirements
Electrical and Mechanical Equipment	For dwelling constructed on land to which this Policy applies, the electrical and mechanical materials, equipment and installation should conform to the following requirements.
Heating and Air Conditioning System	Heating and air conditioning systems should, to the maximum extent possible, be installed in areas and spaces above the flood planning level. When this is not feasible, every precaution should be taken to minimise the damage caused by submersion according to the following guidelines.
Main Power Supply	Subject to the approval of the relevant authority, incoming electricity mains, service equipment and meters must be located at or above the flood planning level. Means must be available to easily disconnect the building from the main power supply.
Fuel	Heating systems using gas or oil as a fuel should have a manually operated valve located in the fuel supply line to enable fuel cut-off.
Wiring	All wiring, power outlets, switches, etc, should, to the maximum extent possible, be located 1m above the flood planning level. All electrical wiring installed below the flood planning level should be suitable for continuous submergence in water and should contain no fibrous components. Only submersible type splices should be used below the flood planning level. All conduits located below the relevant flood planning level should be installed so that they will be self-draining if subject to flooding.
Installation	The heating equipment and fuel storage tanks should be mounted and anchored securely to a foundation pad of sufficient mass to overcome buoyancy and prevent movement that could damage the fuel supply line All storage tanks should be vented to an elevation above the flood planning level.
Equipment	All equipment installed below or partially below the flood planning level should be capable of disconnection by a single plug and socket assembly.
Ducting	All ducting located below the flood planning level should be provided with openings for drainage and cleaning. Self-draining may be achieved by constructing the ducting on a suitable grade. Where ducting must pass through a watertight wall or floor below the flood planning level, the ducting

	should be protected by a closure assembly operated from above the flood planning level.
Reconnection	Should any electrical device and/or part of the wiring be flooded it should be thoroughly cleaned or replaced and checked by an approved electrical contractor before reconnection.
Services	The provision of and connection to all public utility services must comply with the requirements of the relevant service authority.

APPENDIX 6 – SUPPORTING DOCUMENTS

The following documents have been referred to in this policy document:

Supporting Documents	Access Link
Australian Disaster Resilience Handbook 7, Australian Institute of Disaster Resilience	Click Here
Camden Development Control Plan, Camden Council, 2019	Click Here
<i>Camden Local Environmental Plan 2010</i>	Click Here
Camden Local Flood Plan	Click Here
Floodplain Development Manual: The management of flood liable land, NSW Government, April 2005 or applicable version	Click Here
Narellan Creek Flood Study, Public Works, 2017	Click Here
Nepean River Floodplain Risk Management Study and Plan including Narellan Creek, Cardno, 2022	Click Here
Review of Upper South Creek Flood Study in the Context of Ongoing Development, WMA Water, 2022	Click Here
State Environmental Planning Policy (Precincts – Western Parkland City) 2021 (SEPP)	Click Here
The Camden Growth Areas Development Control Plan	Click Here
Upper South Creek Floodplain Risk Management Study and Plan, Cardno, 2019	Click Here

RELEVANT LEGISLATIVE INSTRUMENTS:

Camden Local Environmental Plan 2010
Environmental Planning and Assessment Act 1979
Local Government Act 1993
Local Government (General) Regulation 2021
State Environmental Planning Policy (Sydney Region Growth Centres) 2006

RELATED POLICIES, PLANS AND PROCEDURES:

NSW Floodplain Development Manual
 NSW Flood Prone Land Policy

RESPONSIBLE DIRECTOR:

Community Assets

APPROVAL:

Council

HISTORY:

Version	Approved by	Changes made	Date	EDMS Number
1	Approved by Council ORD88/06	Original Version	10/04/2006	15/220972
2	Approved by Council ORD22/23	Inclusion of additional content to reflect both catchment areas.	14/02/2026	15/220972