

## Outline

# Part 10 Natural hazards

### **Explanatory outline**

Part 10 specifies outcomes, design guidelines and other requirements relating to the management of natural hazards. There are separate sections for each of the following matters:

- 10a Floodplain Management**
- 10b Bushfire risk**
- 10c Geotechnical hazard**

## 10a Floodplain Management

### Explanatory outline

Section 10a outlines assessment criteria relating to the management of development on flood prone land. The following matters are covered:

- compatibility of development with flood hazard
- general flood considerations, including flood proofing requirements
- safety considerations
- habitable (residential) buildings
- alterations and additions to habitable (residential) buildings
- non residential development
- rural development

## 10a Floodplain Management

### 10a.1 Introduction

The management of flood prone land is primarily the responsibility of councils by implementing the provisions in the NSW Government's Flood Prone Land Policy and the associated *NSW Floodplain Development Manual 2005*. Accordingly, this DCP chapter has been prepared with regard to the above provisions.

### 10a.2 Application of this Part

This section applies to development described in Column 1 when carried out on land described in Column 2.

#### Column 1: Type of development

Any residential development

Any other development requiring consent

#### Column 2: Applicable land

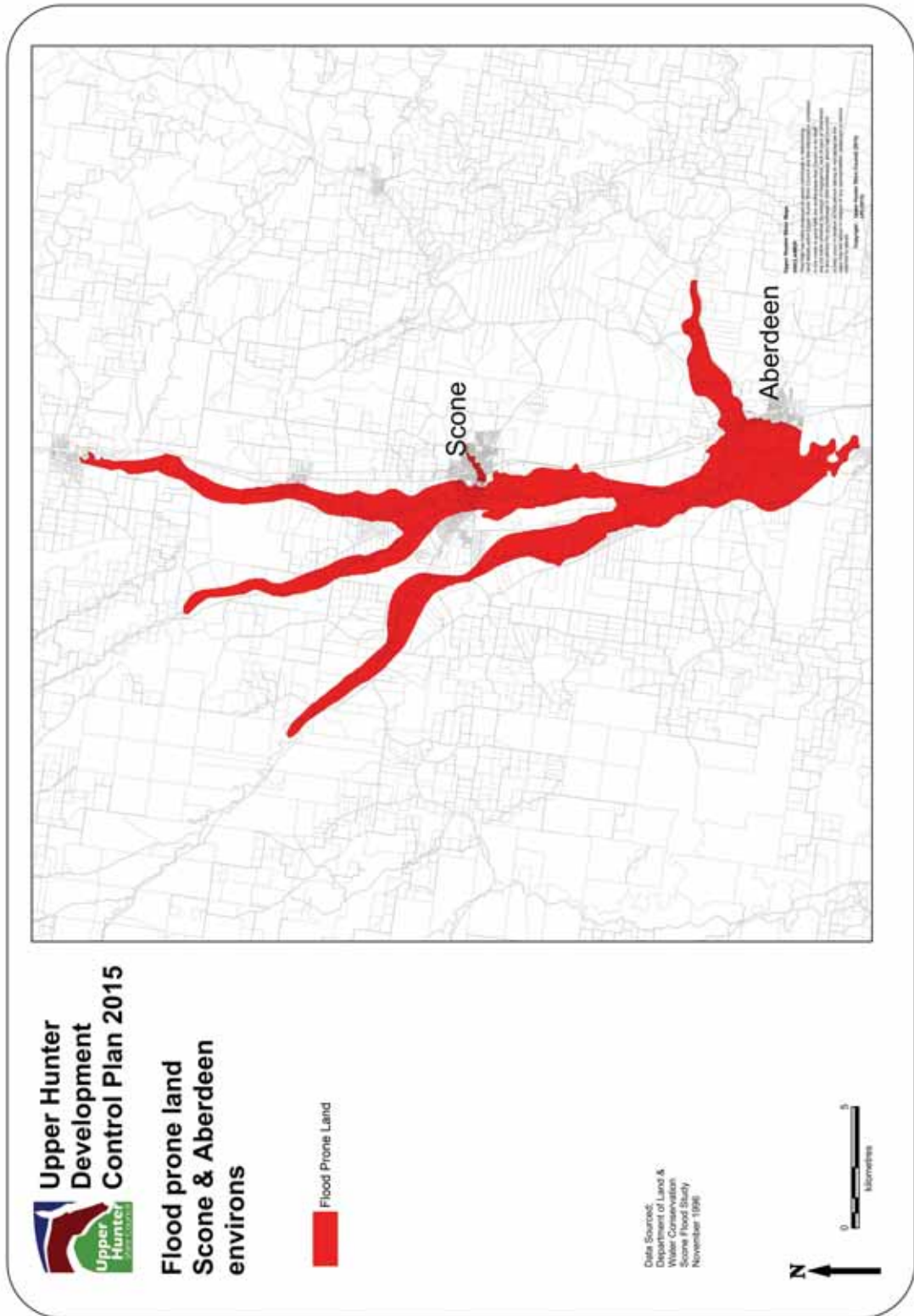
On land below the Flood Planning Level (FPL)

On any flood prone land, including that as identified on:

- Map 8: Flood Prone Land, Scone and Aberdeen environs;
- Map 9: Flood prone land and flood hazard, Aberdeen;
- Map 10: Flood prone land and flood hazard, Scone;
- Map 11: Flood prone land and flood hazard, Central Scone and Figtree Gully;
- Map 12: Flood prone land and flood hazard, Murrurundi
- Map 13: Flood prone land and flood hazard, Blandford

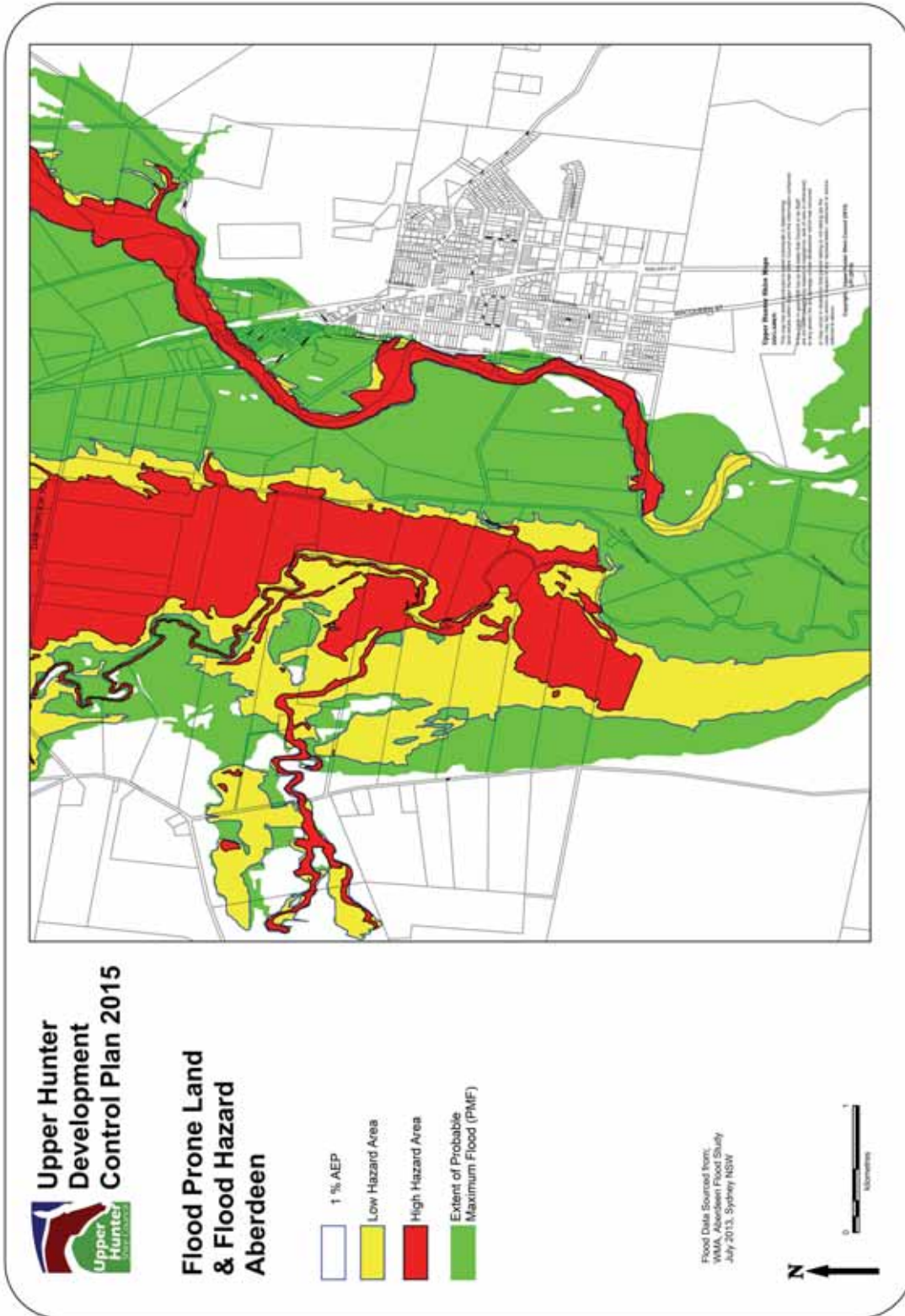
# 10a Floodplain Management

Map 8: Flood Prone Land, Scone and Aberdeen environs



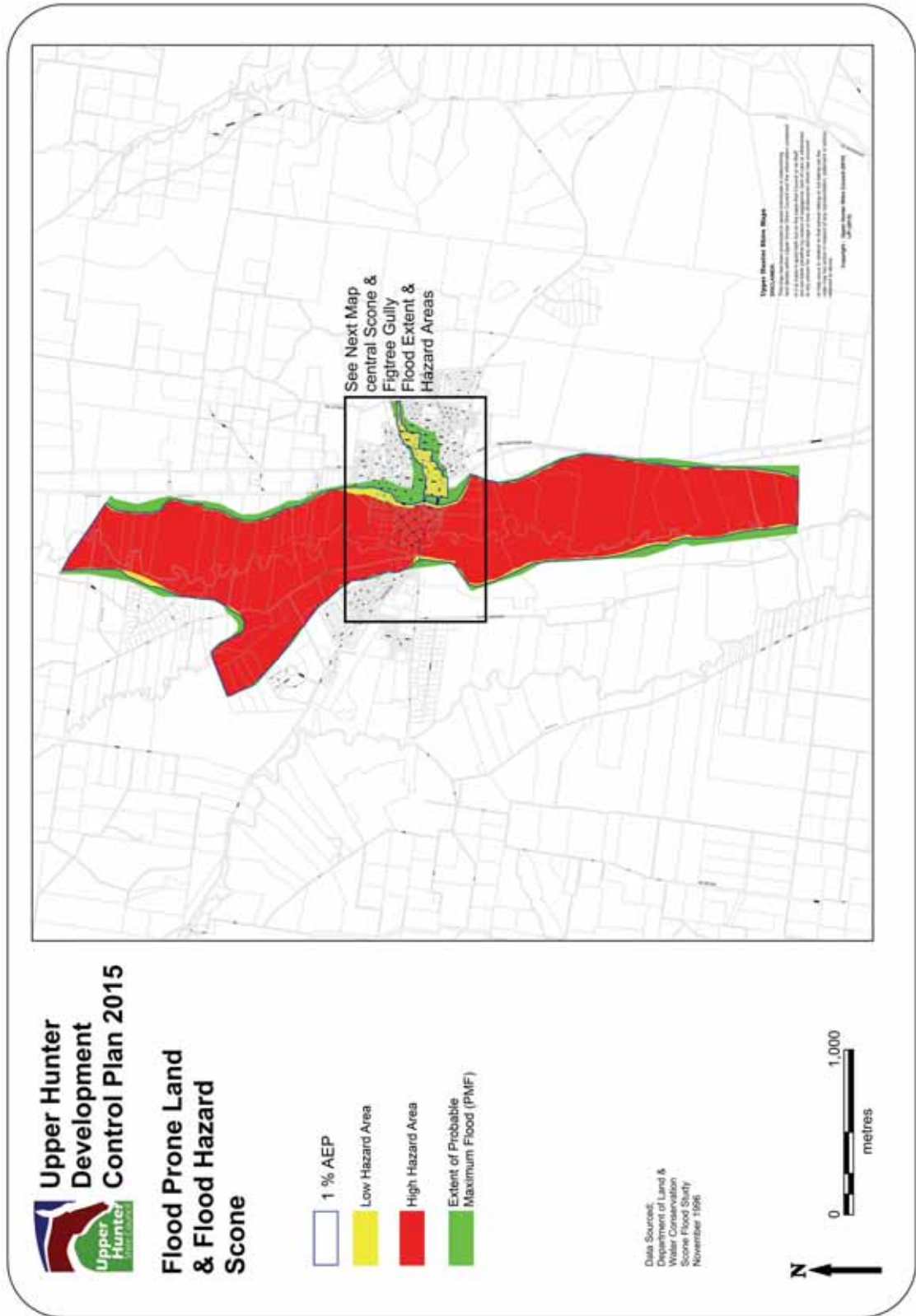
# 10a Floodplain Management

Map 9: Flood prone land and flood hazard, Aberdeen



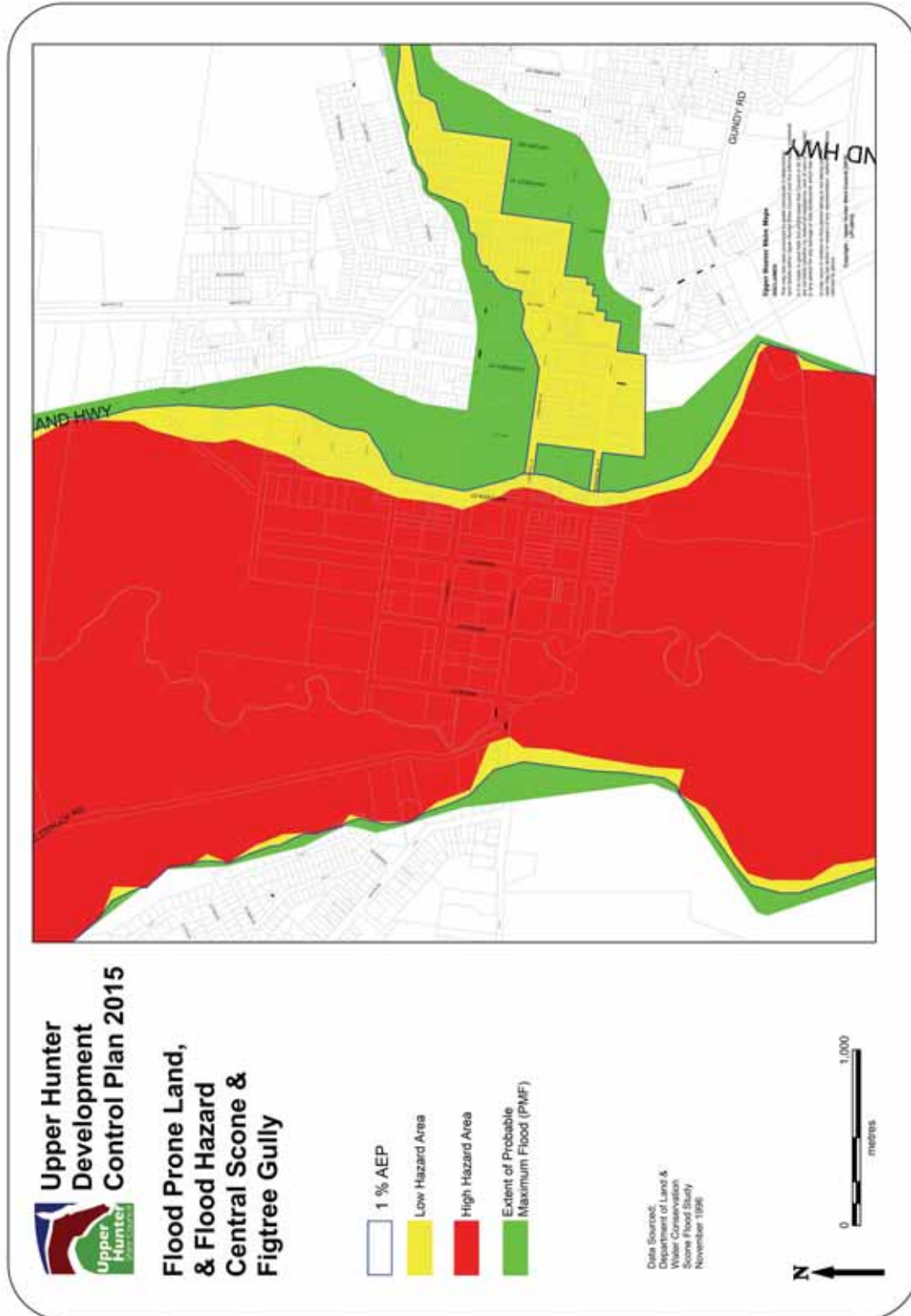
# 10a Floodplain Management

Map 10: Flood prone land and flood hazard, Score



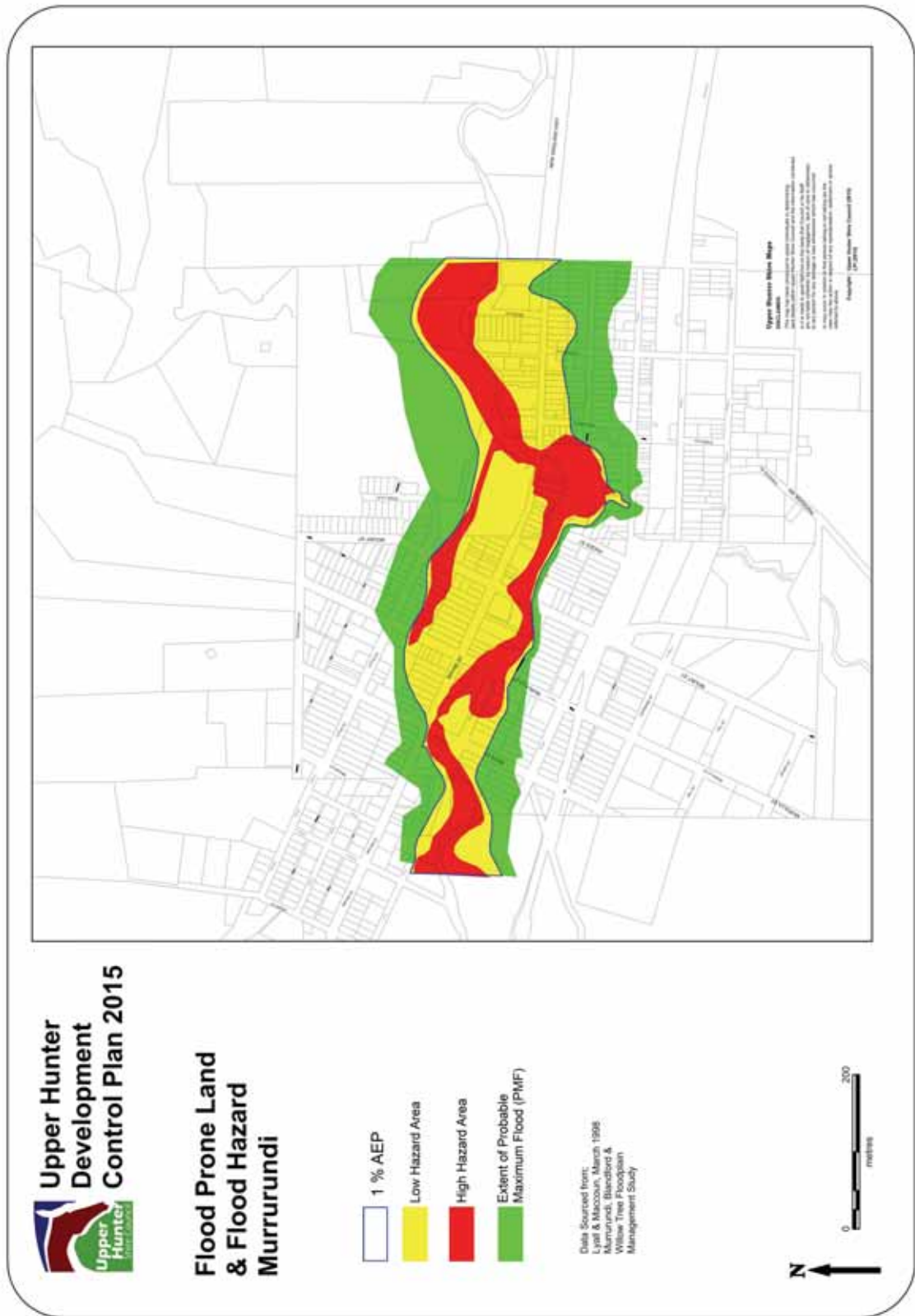
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Map 11: Flood prone land and flood hazard, Central Scone and Figtree Gully



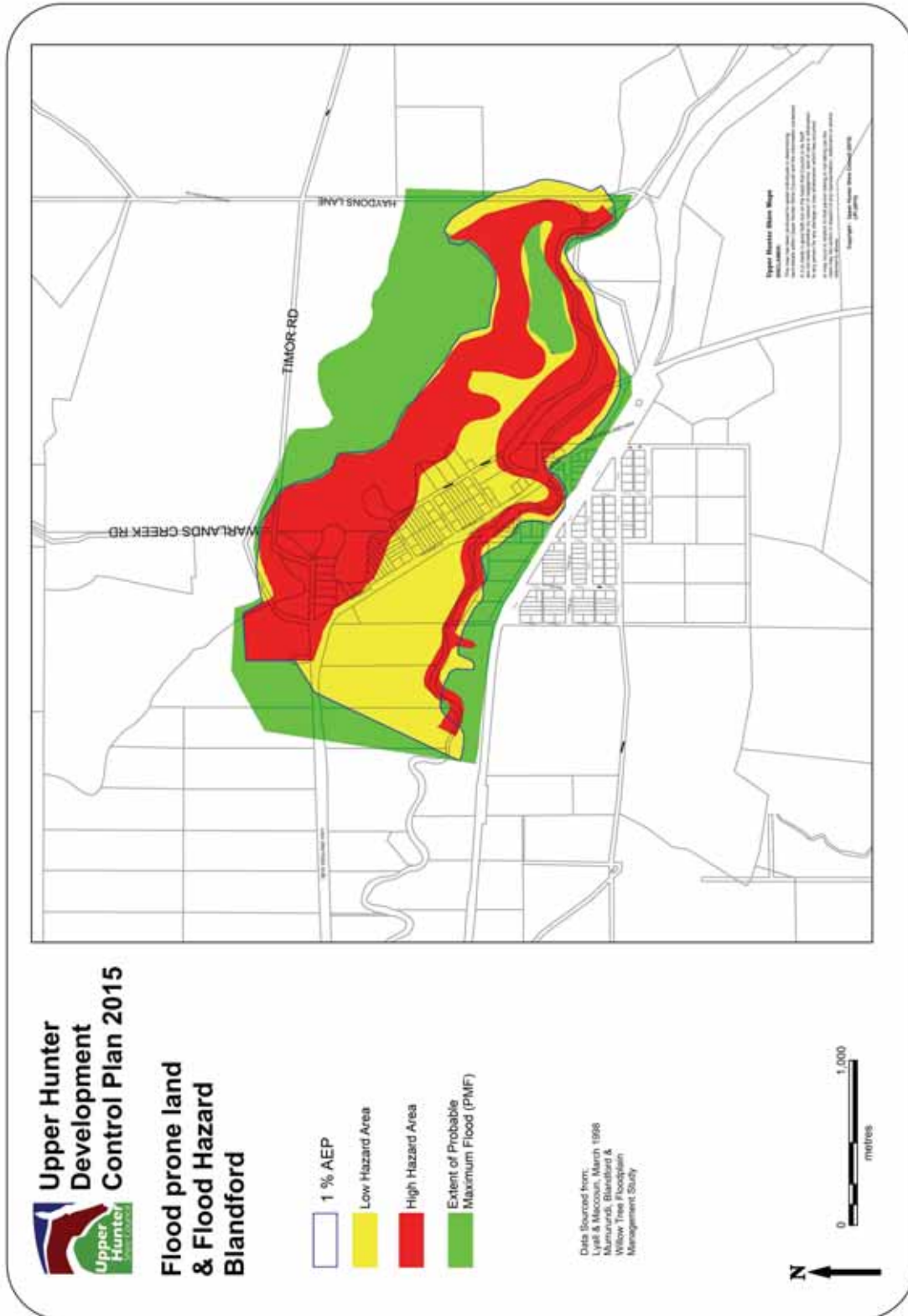
# 10a Floodplain Management

Map 12: Flood prone land and flood hazard, Murrurundi



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Map 13: Flood prone land and flood hazard, Blandford





## 10a Floodplain Management

### 10a.3 Relevant planning instruments & legislation

The following environmental planning instruments or other legislation are relevant to development to which this section applies:

- *Upper Hunter Local Environmental Plan 2013* (clause 6.2 Flood Planning)

Further planning instruments and legislation may also be relevant. In the event of any inconsistency, the above listed instruments will prevail over requirements or criteria contained in this section.

The NSW Government's *NSW Floodplain Development Manual 2005* is also applicable.

### 10a.4 Definitions

The terms that are used in this Section of the DCP are consistent with the NSW Government's *NSW Floodplain Development Manual 2005* and *Upper Hunter Local Environmental Plan 2013*. Relevant terms to this chapter in addition to those found in the UHLEP 2013 can be found in the Dictionary.

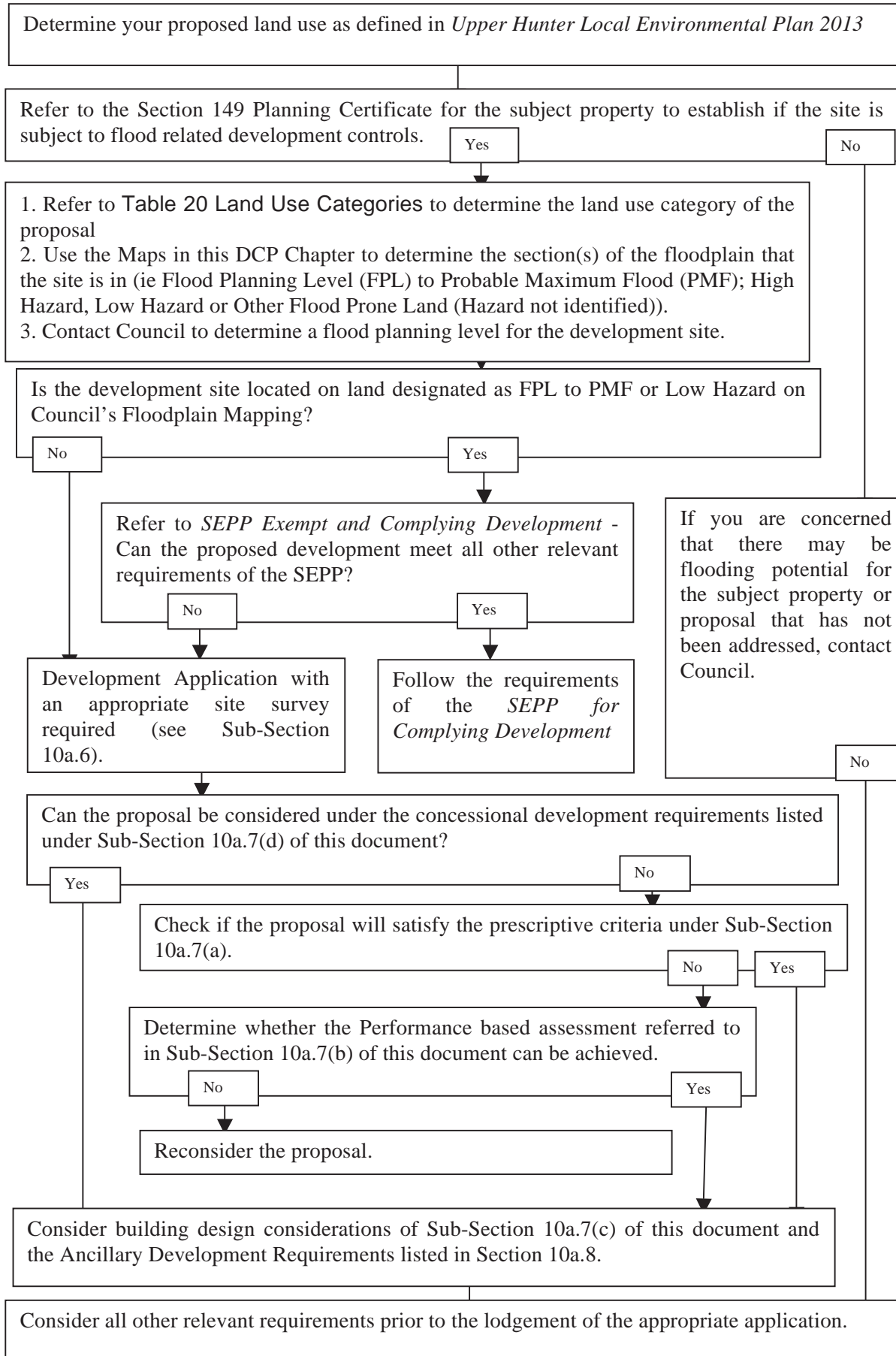
### 10a.5 Objectives

The objectives of this section are to:

- To minimise the risk to human life and damage to property by controlling development on flood prone land
- To apply a performance and merit based approach to all development decisions taking into account ecological, social, engineering safety and environmental considerations to ensure development is appropriate and sustainable
- To ensure that the development or use of floodplains waterways and riparian corridors does not adversely impact upon aesthetic, recreational and ecological values
- To ensure that all land uses and essential services are appropriately sited and designed in recognition of all potential floods
- To promote flood compatible building design that considers requirements for the development of flood prone land and does not adversely impact on adjoining properties
- To establish guidelines for the development of flood prone land that are consistent with the *NSW Flood Policy and NSW Floodplain Development Manual (2005)* and as updated by the associated *Floodplain Risk Management Guides*

# 10a Floodplain Management

## 10a.6 Using this Chapter



## 10a Floodplain Management

### 10a.6 Application Requirements

Development applications that are subject to this section should be supported by the following plans and documentation.

Item	When required	Plans or information to be provided
A. General requirements	All applications	Refer to section 2c Lodging a development application.
B. Specific information requirements	All applications	<p>Development Applications for land subject to flood related development controls are to include the following information</p> <ul style="list-style-type: none"> <li>• A survey plan indicating:               <ul style="list-style-type: none"> <li>i the position of the existing building/s or proposed building/s;</li> <li>ii the existing ground levels and features to Australian Height Datum around the perimeter of the site and contours of the site; and</li> <li>iii the existing or proposed floor levels to Australian Height Datum.</li> </ul> </li> <li>• Applications for earthworks, filling of land, infrastructure and subdivision are to be accompanied by a survey plan (with a minimum contour interval of 0.25m) showing relative levels to Australian Height Datum.</li> <li>• For large scale developments, or developments that in the opinion of Council are in critical situations, where an existing catchment based flood study is not available, a flood study prepared by a suitably qualified engineer using hydrologic and hydraulic dynamic one or two dimensional computer model may be required.</li> <li>• Any required information listed in Table 17 Prescriptive Criteria as applicable.</li> </ul>

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### 10a.7 Development Provisions

The development provisions are divided into prescriptive criteria and performance based assessment. Where the prescriptive controls cannot be met, an applicant can refer to the performance based assessment for flood related development controls on their site.

#### 10a.7(a) Prescriptive Criteria

The Prescriptive Provisions shown within **Error! Reference source not found.** indicate where flood related development controls:

- can be met through the implementation of provisions as indicated (yellow and numbered);
- are not required (shown in green)
- in the view of Council, cannot be met through the use of reasonable development controls and will require further justification to be supported using the performance based assessment approach (shown in orange).

**Table 16: Floodplain management prescriptive provisions matrix**

Proposed Land use	Section of Floodplain			
	Flood Planning Level (FPL) to Probable Maximum Flood (PMF)	Low Hazard	High Hazard	Other Flood Prone Land (Hazard Unknown)
1 Single Dwelling Houses		1,2,5		
2 Agriculture & Recreation		2,5		
3 Sheds / Garages / ancillary Residential		1,2,5		
4 Commercial and Industrial Uses		2, 6		
5 Medium to High Density Residential				
6 Critical or Sensitive Facilities	3			
7 Land Subdivision	4			
8 Tourist Development				
9 Caravan parks - short-term sites		5,6		
10 Permissible Earthworks		7		



Flood related development controls do not apply



Flood related development controls apply (refer to numbered prescriptive criteria in Table 17 Prescriptive Criteria)



If the proposal is to be pursued further, a performance based assessment is to be provided demonstrating that the proposed development is compatible with the flooding characteristics of the site (refer to the section "Performance based assessment" and Table 19 Detailed Assessment Criteria).

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**Table 17 Prescriptive Criteria – floodplain management**

Prescriptive Criteria No.	Prescriptive Criteria
1	Assessment indicating that the proposal can meet the relevant requirements of the BCA.
2	<p>Joint report by a professional engineer who specialises in floodplain management and a professional engineer who specialises in civil engineering to certify that the development provides:</p> <ul style="list-style-type: none"> <li>• Minimum Habitable Floor Levels = 1% AEP flood level plus 500mm freeboard (<i>Flood Planning Level</i>)</li> <li>• Minimum Non-Habitable Floor Levels = 5% AEP flood level plus 500mm freeboard.</li> <li>• Minimum level requirements for electrical fittings, internal sewer fixtures, and external overflow gully risers apply as per Building Code of Australia</li> <li>• Minimum levels of open car parking spaces, carports and driveways = 5% AEP flood level</li> <li>• Mine subsidence allowance to be added to levels (a), (b), (c) &amp; (d) above, if applicable.</li> <li>• Low flood hazard access and egress for pedestrians during a <u>1% AEP</u> flood to an appropriate area of refuge located above the Flood Planning Level.</li> <li>• Low flood hazard emergency vehicle road access (Ambulance, SES, RFS) during a <u>1% AEP</u> flood event.</li> <li>• All proposed structural components that can withstand the forces of floodwater including hydrostatic pressure, hydrodynamic pressure, impact of debris and buoyancy forces up to the flood planning level.</li> <li>• Building materials and surface finishes at or below the flood planning level are all capable of withstanding prolonged immersion in water.</li> <li>• Negligible flood affectation elsewhere in the floodplain for a full range of flood events up to the 1% AEP flood event, 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.</li> </ul>
3	<p>Joint report by a professional engineer who specialises in floodplain management and a professional engineer who specialises in civil engineering to certify that the development provides:</p> <ul style="list-style-type: none"> <li>• Minimum floor levels = PMF level plus 500mm freeboard plus mine subsidence allowance, if applicable.</li> <li>• Low flood hazard access and egress for pedestrians during a <u>PMF</u> flood to an appropriate area of refuge located above the PMF.</li> <li>• Low flood hazard emergency vehicle road access (Ambulance, SES, RFS) during a <u>PMF</u> flood event.</li> </ul>
4	<p>Joint report by a professional engineer who specialises in floodplain management and a professional engineer who specialises in civil engineering to certify that the development provides:</p> <ul style="list-style-type: none"> <li>• Minimum height of building footprints, open car parking areas, driveways and new public roads = 5% AEP flood level plus mine subsidence allowance, if applicable</li> <li>• Low flood hazard access and egress for pedestrians during a 1% AEP flood to an appropriate area of refuge located above the Flood Planning Level.</li> <li>• Low flood hazard emergency vehicle road access (Ambulance, SES, RFS) during a <u>1% AEP</u> flood event.</li> <li>• Risk assessment of flood hazard during a <u>PMF</u> flood event; including consideration of changes to flood behaviour, and location of floodways, to ensure that the consequences of the increased flood hazard are acceptable and manageable.</li> </ul> <p>Negligible flood affectation elsewhere in the floodplain for a full range of flood events up to the <u>PMF</u>, having regard to:</p>

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	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.
5	No filling allowable apart from area of building footprint, open car parking areas and driveway
6	Joint report by a professional engineer who specialises in floodplain management and a professional engineer who specialises in civil engineering to include an Evacuation Plan demonstrating that permanent, failsafe, and maintenance free measures are incorporated in to the development to ensure the timely and safe evacuation of people from the development in a 1% AEP Flood event, without significant cost or risk added to emergency services personnel. Signage of the plan must be prominently displayed around the development.
7	Report by a professional engineer who specialises in floodplain management to certify that the development provides: Negligible flood affectation elsewhere in the floodplain for a full range of flood events up to the <u>1% AEP</u> flood event, having regard to: <ol style="list-style-type: none"> <li>loss of flood storage,</li> <li>changes in flood levels, flows and velocities upstream, downstream and adjacent to the site,</li> <li>cumulative impact of multiple development in the vicinity.</li> </ol>

### 10a.7(b) Performance based assessment

Council will consider development proposals that do not meet the prescriptive requirements of this DCP Chapter only if a report prepared by a suitably qualified engineering professional accompanies the development application and addresses the following criteria. The information listed below can be used to justify minor variations to the prescriptive provisions. **Table 19 Detailed Assessment Criteria** provides further detail with regard to applying the Performance Criteria mentioned below and will need to be addressed in full for large scale proposals and/or significant variations.

- is compatible with the established flood hazard of the land. In areas where flood hazard has not been established through previous studies or reports, the flood hazard must be established in accordance with the Floodplain Development Manual.
- will not significantly adversely affect flood behaviour resulting in detrimental increases in the potential flood affectation of other development or properties;
- incorporates appropriate measures to manage risk to life and property from flood;
- will not significantly adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses;
- is not likely to result in unsustainable social and economic costs to the community as a consequence of flooding.
- is consistent with the principles of Ecologically Sustainable Development.

Note: The prescriptive controls have been developed to ensure that proposals that meet the requirements of the relevant Prescriptive Control Schedule will meet the objectives of this Plan. A performance based assessment is likely to involve the submission of independent studies and reports. It is recommended that you should discuss the level of detail required and the likelihood of achieving a successful outcome using a performance based assessment with Council staff prior to making any decision to purchase and/or develop flood prone land

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### 10a.7(c) Building Design Considerations

Building design, whether relying on the Prescriptive Controls or Performance Criteria, should not result in significant impacts upon the amenity of an area by way of:

- overshadowing of adjoining properties that does not meet the requirements of the relevant development controls adopted by Council;
- privacy impacts (e.g. by unsympathetic house-raising);
- being incompatible with the streetscape or character of the locality. A request to raise the overall building height to beyond the prescribed building heights to achieve the appropriate minimum floor level will not be considered adequate. Building design is to be appropriate to the constraints of the site;
- filling of land to permit the construction of a building that has not been specifically designed in consideration with conditions that may be experienced on the floodplain. Slab on ground construction is generally not considered appropriate on a floodplain.

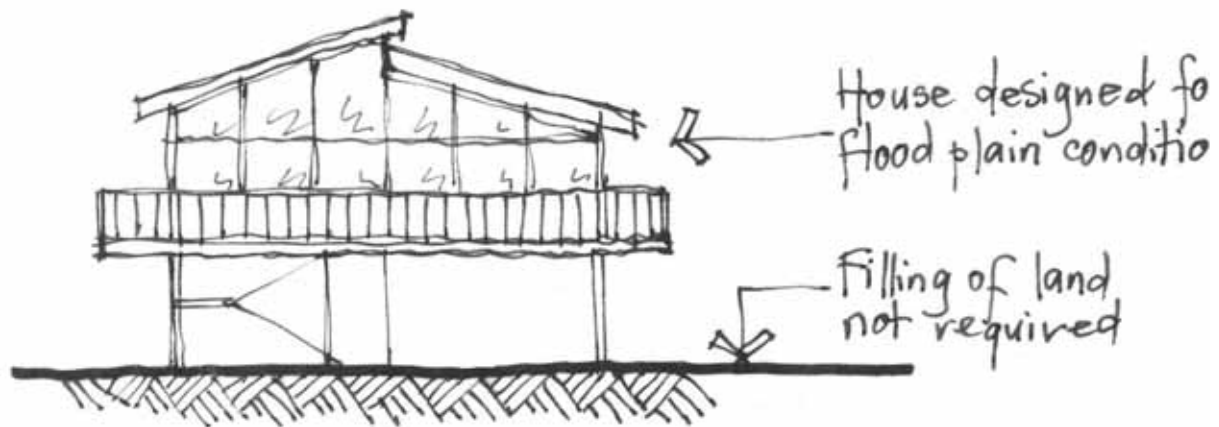


Figure 14 Floodplain development (where considered acceptable)

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Figure 15 Inappropriate floodplain development

### 10a.7(d) Concessional Development – Minor Additions

In some instances, relatively minor building additions will have a minimal impact on the floodplain and will not present an unmanageable risk to life. Council will give consideration for the following forms of development on suitable sites:

- single dwelling house additions of up to 40m<sup>2</sup> of habitable floor area at or above the same level as the existing adjoining approved floor level for habitable floor area. The allowance for additions shall be made no more than once for any given development. Proposals for dwelling additions that exceed 40m<sup>2</sup> of habitable floor area are to refer to the provisions for single dwellings under Sub-Section 10a.6(a);
- additions to Commercial and Industrial Uses of up to an additional 100 m<sup>2</sup> or 20% (whichever the less) of the Gross Floor Area of the existing building at no less than the same level as the existing adjoining approved floor level. The allowance for additions shall be made no more than once for any given development. Proposals for additions that exceed 100 m<sup>2</sup> or 20% (whichever the less) of the Gross Floor Area are to refer to the provisions for commercial and industrial uses under Sub-Section 10a.6(a);

Any proposal to be considered as concessional development must:

- be supported with appropriate information at the development application stage that the proposed development can meet the requirements of the Building Code of Australia.

Note: The additional costs in achieving the requirements of the BCA for development below the flood planning level needs to be considered by the proponent prior to the submission of a Development Application.

- comply with the Building Design Considerations, Section 10a.7 – General Requirements, and any other relevant provisions of DCP 2015.

As part of any consent issued pursuant to this Section, Council may require:

- a restriction on use placed on the property title limiting the further development of the site;



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- the existing development to be suitably upgraded to address the potential impacts of flooding.

Note: Due to concerns for safety and the consequences of prolonging poor land use practices, concessional development or other site redevelopment will not be supported within High Hazard areas

### 10a.8 Ancillary Development Requirements

Objectives	Requirements
<p><b>A. Fencing</b></p> <ul style="list-style-type: none"> <li>To ensure that fencing does not result in any significant obstruction to the free flow of floodwaters.</li> <li>To ensure that fencing will remain safe during floods and not become moving debris that potentially threatens the security of structures or the safety of people.</li> </ul>	<ul style="list-style-type: none"> <li>Fencing is to be constructed in such a manner that it will not modify the flow of floodwaters or cause damage to surrounding land.</li> <li>Fencing construction is to withstand flood waters including debris loads.</li> </ul>
<p><b>B. Car Parking</b></p> <ul style="list-style-type: none"> <li>To minimise the damage to motor vehicles from flooding.</li> <li>To ensure that motor vehicles do not become moving debris during floods, which threaten the integrity or blockage of structures or the safety of people, or damage other property.</li> <li>To minimise risk to human life from the inundation of basement and other car park or driveway areas.</li> </ul>	<ul style="list-style-type: none"> <li>The proposed car park should not increase the risk of vehicle damage by flooding inundation. Any car park is to allow for a maximum of 300mm still water flood water depth unless otherwise provided through a flood study.</li> <li>The proposed garage/car park should not increase the likelihood of flooding on other developments, properties or infrastructure.</li> <li>Open car parking - The minimum surface level of open space car parking subject to inundation should be designed having regard to vehicle stability in terms of depths and velocity during inundation by flood waters.</li> </ul>
<p><b>C. Requirements for Filling Flood Prone Land</b></p> <ul style="list-style-type: none"> <li>To ensure that any filling of land that is permitted as part of a development consent does not have a negative impact on the floodplain.</li> </ul>	<ul style="list-style-type: none"> <li>Filling for any purpose (including the raising of a building platform in flood-prone areas) is not permitted in areas identified as High Hazard or Hazard Unknown in Table 16 , unless a Floodplain Risk Management Plan for the catchment has been adopted which allows filling to occur. In all other areas, filling will not be permitted unless a report from a suitably qualified engineer has been submitted and approved by Council that certifies that the development will not increase flood affectation elsewhere.</li> <li>Filling of individual sites in isolation, without consideration of the cumulative effects is not permitted. Any proposal to fill a site must be accompanied by an analysis of the effect on flood levels of similar filling of developable sites in the area. This analysis would form part of a flood study prepared by a suitable qualified professional.</li> </ul>
<p><b>D. On-Site Sewer Management</b></p> <ul style="list-style-type: none"> <li>To prevent the spread of pollution from on-site sewage management systems during periods of flood.</li> <li>To assist in the ongoing operation of on-site sewage management systems during periods of flood.</li> </ul>	<ul style="list-style-type: none"> <li>The treatment tank/holding device and electrical components are to be located above the 1% AEP flood contour.</li> <li>The land application area is to be above the 5% AEP flood contour.</li> <li>Refer to <b>Part 11g – On Site Waste Water Management in Non-Sewered areas</b> for guidance with regard to this form of application.</li> </ul>



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Objectives	Requirements
<p><b>E. Storage of Hazardous Substances</b></p> <ul style="list-style-type: none"><li>■ To prevent the potential spread of pollution from hazardous substances.</li></ul>	<ul style="list-style-type: none"><li>• The storage of products which, in the opinion of Council, may be hazardous or pollute floodwaters, must be placed at a minimum of 500 mm above the height of the 1% AEP flood or placed within an area protected by bunds or levees such that no flood waters can enter the bunded area if the flood level rose to a level of 500 mm above the height of the 1% AEP flood.</li></ul>

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**Table 18: Flood proofing requirements**

Component	1st Preference	2nd Preference
Flooring and Sub Floor Structure	Concrete slab-on-ground monolith construction. <i>NB: clay filling is not permitted beneath slab-on-ground construction, which could be inundated.</i> Suspension reinforced concrete slab.	Timber floor (T and G boarding, marine plywood) full epoxy sealed joints.
Nails, bolts, hinges and fittings	Brass, nylon or stainless Removable pin hinges	Galvanised steel aluminium
Floor Covering	clay tiles concrete, precast or in situ concrete tiles epoxy, formed-in-place mastic flooring, formed-in-place rubber sheets or tiles with chemical-set adhesives silicon floors formed-in-place vinyl sheets or tiles with chemical-set adhesive ceramic tiles, fixed with mortar or chemical-set adhesive asphalt tiles, fixed with water resistant adhesive	cement/bituminous formed-in-place cement/latex formed-in-place rubber tiles with chemicals set adhesive terrazzo vinyl tile with chemical set adhesive vinyl-asbestos tiles asphaltic adhesives loose rugs alkali-resistant grout
Wall Structure	solid brickwork, blockwork, reinforced, concrete or mass concrete	Two skins of brickwork or blockwork with inspection openings.
Roofing Structure (for situations where the flood planning level is above the ceiling height)	Reinforced concrete construction Galvanised metal construction	Timber trusses
Doors	Solid panel with water proof adhesives Flush door with marine ply filled with closed cell foam Painted metal construction Aluminium or galvanised steel frame	Flush panel or single panel with marine plywood and water proof adhesive TandG lined door, framed ledged and braced Painted steel Timber frame fully epoxy Sealed before assembly
Insulation	Foam or closed cell types	Reflective insulation
Wall and Ceiling	Brick, face or glazed Clay tile glazed in water proof mortar Concrete Concrete block Steel with water proof applications Stone, natural solid or veneer, water proof grout Glass blocks Glass Plastic sheeting or wall with water proof adhesive	Brick, common Plastic wall tiles Metals, non ferrous Rubber mouldings and trim Wood, solid or exterior grade plywood fully sealed.
Windows	Aluminium frame with stainless steel or brass rollers Galvanised or painted steel	Epoxy sealed timber water proof glues with stainless steel or brass fittings

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**Table 19 Detailed Assessment Criteria – floodplain management**

Component	Assessment Criteria
<b>Compatibility with established Flood Hazard / Flooding Impacts and Behaviour:</b>	<ul style="list-style-type: none"> <li>• impact of flooding and flood liability is to be managed ensuring the development does not divert floodwaters or interfere with flood storage or natural function of the waterway;</li> <li>• flood behaviour (for example, flood depths reached, flood flow velocities, flood hazard, rate of rise of floodwater);</li> <li>• duration of flooding for a full range of events;</li> <li>• appropriate flood mitigation works;</li> <li>• freeboard;</li> <li>• Council's duty of care – proposals to address and limit;</li> <li>• depth and velocity of flood waters for relative flood event;</li> </ul>
<b>Impact on other land / Cumulative Effects of the Development:</b>	<ul style="list-style-type: none"> <li>• development should not detrimentally increase the potential flood affectation on other development or properties or infrastructure, either individually or in combination with the cumulative impact of development that is likely to occur in the same floodplain;</li> <li>• cumulative effects of the development and precedents created for further cumulative development.</li> </ul>
<b>Manage Risk to Life:</b>	<ul style="list-style-type: none"> <li>• the proposed development should not result in any increased risk to human life;</li> <li>• controls for risk to life for floods up to the Flood Planning Level;</li> <li>• controls for risk to life for floods greater than the Flood Planning Level;</li> <li>• existing floor levels of development in relation to the Flood Planning Level and floods greater than the Flood Planning level;</li> <li>• Council's duty of care – Proposals to address and limit;</li> <li>• what level of flooding should apply to the development e.g. 1 in 20 year, etc;</li> <li>• effective flood access and evacuation issues;</li> <li>• flood readiness – Methods to ensure relative flood information is available to current and future occupants and visitors;</li> <li>• where appropriate existing information does not exist, a site specific Flood Risk Assessment in support of the application addressing the requirements of the NSW Flood Policy and NSW Floodplain Development Manual 2005. These documents are available from the NSW Department of Environment, Climate Change and Water website. <a href="http://www.environment.nsw.gov.au/floodplains/manual.html">http://www.environment.nsw.gov.au/floodplains/manual.html</a>.</li> </ul>
<b>Warning and Evacuation:</b>	<ul style="list-style-type: none"> <li>• available effective warning time and reliable access for the evacuation of an area potentially affected by floods;</li> <li>• evacuation should be consistent with any relevant or flood</li> </ul>

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	<p>evacuation strategy where in existence;</p> <ul style="list-style-type: none"> <li>• depth and velocity of flood waters for relative flood event;</li> <li>• Council's duty of care – proposals to address and limit;</li> <li>• what level of flooding should apply to the development e.g. 1 in 20 year, etc;</li> <li>• effective flood access and evacuation issues;</li> <li>• flood readiness – methods to ensure relative flood information is available to current and future occupants and visitors.</li> </ul>
<b>Environmental Impacts:</b>	<ul style="list-style-type: none"> <li>• will not significantly adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.</li> </ul>
<b>The Cost:</b>	<ul style="list-style-type: none"> <li>• the additional economic and social costs that may arise from damage to property from flooding should not be greater than that which can reasonably be managed by the property owner and general community;</li> <li>• land values and social equity – effect both negative and positive – e.g. development increasing land values, restrictions decreasing land values, etc;</li> <li>• future development (specifically, the ability of the community and individuals to recover from flood events);</li> <li>• economic factors both in regard to doing and not doing the development;</li> <li>• social issues;</li> <li>• servicing the development safely in flood e.g. potable water, sewer, etc.</li> </ul>
<b>Ecological Sustainable Development:</b>	<p>Proposed development must be consistent with ESD principles including but not limited to:</p> <ul style="list-style-type: none"> <li>• intergenerational equity – namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations;</li> <li>• the precautionary approach - namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;</li> <li>• biodiversity conservation - namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration;</li> <li>• improved valuation, pricing and incentive mechanisms - namely, that environmental factors should be included in the valuation of assets and services.</li> </ul> <p>Further information regarding ESD principles may be sourced from the <i>Environmental Planning and Assessment Regulations 2000 Schedule 2 Part 6</i>.</p>
<b>Emergency Services</b>	<ul style="list-style-type: none"> <li>• development will not unduly increase dependency on emergency services.</li> </ul>

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**Table 20 Land Use Categories – floodplain management**

The definitions listed below are extracted from the Upper Hunter Local Environmental Plan 2013 (Refer to Council's website: <http://upperhunter.nsw.gov.au/our-services/on-your-property/building-planning/local-environmental-plan.aspx>)

Land Use	Specific Use or Activity
Single Dwelling Houses	Dwelling houses, exhibition homes (Note: one dwelling per existing residential lot only)
Medium to High Density Residential	Attached dwelling, boarding house, caravan parks (long term sites), dual occupancy, exhibition village, manufactured home estates, multi dwelling housing, residential flat buildings, rural workers dwelling, secondary dwelling, semi-detached dwelling, shop-top housing.
Agriculture and Recreation	Agriculture, farm buildings, recreation area, stock and sales yard, environmental facility,
Shed and Garages, ancillary residential development (Note: ancillary residential development includes swimming pools, cabanas, gazebos and similar structures)	
Commercial	Amusement centres; Boarding houses; Boat sheds; Car parks; Child care centres; Commercial premises; Community facilities; Crematoria; Educational establishments; Emergency services facilities; Entertainment facilities; Environmental facilities; Flood mitigation works; Function centres; Highway service centres; Home-based child care; Home businesses; Home industries; Information and education facilities; Jetties; Medical centres; Mortuaries; Passenger transport facilities; Places of public worship; Public administration buildings; Recreation areas; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Registered clubs; Research stations; Respite day care centres; Restricted premises; Roads; Seniors housing; Service stations; Sex services premises; Shop top housing; Signage; Tourist and visitor accommodation; Veterinary hospitals; Water recreation structures; Water supply systems; Wharf or boating facilities; Wholesale supplies
Industrial Uses	Boat building and repair facilities; Boat launching ramps; Bulky goods premises; Car parks; Cemeteries; Child care centres; Community facilities; Correctional centres; Crematoria; Depots; Educational establishments; Emergency services facilities; Environmental facilities; Flood mitigation works; Freight transport facilities; Funeral homes; Garden centres; General industries; Hardware and building supplies; Health services facilities; Heavy industrial storage establishments; Heavy industries; Helipads; Heliports; Highway service centres; Industrial retail outlets; Industrial training facilities; Information and education facilities; Jetties; Kiosks; Landscaping material

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	supplies; Light industries; Mortuaries; Neighbourhood shops; Office premises; Passenger transport facilities; Plant nurseries; Public administration buildings; Recreation areas; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Research stations; Restricted premises; Roads; Rural supplies; Service stations; Sewerage systems; Sex services premises; Signage; Storage premises; Take away food and drink premises; Timber yards; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Vehicle sales or hire premises; Warehouse or distribution centres; Water recreation structures; Water supply systems; Wharf or boating facilities; Wholesale supplies
<b>Critical Infrastructure and Facilities</b>	Airstrip, air transport facilities, electricity generating works, emergency service facility, helipad, hospital, public administration buildings (occupied by emergency services organisations), public utility undertaking, sewerage system, water supply system
<b>Sensitive Uses and Facilities</b>	Child care centre, correctional centre, educational establishment, group homes, home based child care, hostel, respite day care centre, seniors housing
<b>Land Subdivision – Torrens Title</b> (Note: Does not include Community and Strata Subdivision or Subdivision of approved residential development)	
<b>Tourist Development</b>	Camping grounds, eco-tourist facilities, tourist and visitor accommodation  (Note: Does not include short-term rental accommodation)
<b>Caravan parks – short term accommodation</b>	Environmental protection works, flood mitigation works
<b>Permissible Earthworks</b>	Environmental protection works, flood mitigation works
<b>Not Listed – Merit Assessment</b>	Forestry, home business, home occupation, home occupation (sex services), wharf or boating facility, signage, boat launching ramp, boat sheds, charter or tourism boating facilities, environmental facilities, jetties, mooring, water recreation structure, extractive industries, open cut mines

Note: The definitions listed above are extracted from the Upper Hunter Local Environmental Plan 2013.

### 10a.9 Supplementary guidance

The following documents or reference materials provide further advice or information that is relevant to this section.

*Aberdeen Flood Study 2013*

*Scone Floodplain Management Study and Floodplain Management Plan 1999*

*Draft Murrurundi Blandford Floodplain Management Study 1997*

*NSW Government - NSW Floodplain Development Manual 2005.*



## 10b Bushfire risk

### Explanatory outline

Section 10b outlines assessment criteria relating to the management of bushfire risk. The following matters are covered:

- identification of bush fire prone land
- requirements and guidelines for development on bush fire prone land
- bush fire assessment report requirements

## 10b Bushfire risk

### 10b.1 Application of this section

This section applies to development described in Column 1 when carried out on land described in Column 2.

Column 1: Type of development	Column 2: Applicable land
Development comprising: <ul style="list-style-type: none"> <li>• subdivision of land for residential purposes</li> <li>• residential accommodation</li> <li>• residential outbuildings</li> <li>• and other development that may be adversely affected by bush fire, such as commercial, industrial and tourist accommodation.</li> </ul>	Land identified as bush fire prone land on the bush fire prone land map. <p><i>Note: To determine whether land is affected by this section, refer to the most recent Upper Hunter Shire Bush Fire Prone Land Map certified by the Commissioner of the NSW Rural Fire Service. This map is available for inspection at the office of the Council, and can be viewed on the Council's web site.</i></p>

### 10b.2 Relevant planning instruments & legislation

The following environmental planning instruments or other legislation are relevant to development to which this section applies:

- *Upper Hunter Local Environmental Plan 2013*
- *Rural Fires Act 1997*
- *Upper Hunter Emergency Risk Management Plan – Natural Hazards*

Further planning instruments and legislation may also be relevant. In the event of any inconsistency, the above listed instruments will prevail over requirements or criteria contained in this section.

### 10b.3 Definitions

The following terms defined in the Dictionary are relevant to this section:

- bush fire hazard reduction work
- bush fire prone land map
- bush fire prone land
- bush fire risk management plan



## 10b Bushfire risk

### 10b.4 Objectives

The objectives of this section are:

- to ensure development is designed, constructed and managed to minimise risks of bush fire
- to comply with the requirements of the *Rural Fires Act 1997*
- to apply the guidelines in current version of *Planning for Bush Fire Protection*.

### 10b.5 Supporting plans & documentation

Development applications that are subject to this section should be supported by the following plans and documentation.

Item	When required	Plans or information to be provided
A. General requirements	All applications	Refer to section 2c Lodging a development application.
B. Bushfire assessment report	Applications that relate to Bush Fire Prone Land	Prepare a Bushfire Assessment Report in accordance with the current version of <i>Planning for Bush Fire Protection</i> .
C. Flora & fauna assessment report	Applications that involve clearing for bush fire protection that affects native vegetation	Include the matters required under section 11b Biodiversity conservation.

### 10b.6 Assessment criteria

A performance-based approach will be adopted in the assessment of development applications. Applications will be assessed according to the extent to which the outcomes specified in the left-hand column of the following table will be satisfied or achieved by the design, construction or operation of the proposal.

The design guidelines specified in the right-hand column indicate design and best practice solutions by which the required outcomes can be met. They do not preclude other solutions that may be suitable under particular local circumstances. All proposals will be considered on merit.

Outcomes to be achieved	Design guidelines
<p>A. Planning for bush fire protection</p> <ul style="list-style-type: none"> <li>■ Development must comply with the provisions of the current version of <i>Planning for Bush Fire Protection</i>.</li> <li>■ Bush fire risk is managed while recognising and protecting the ecological and natural values of the site and adjoining land.</li> </ul>	<ul style="list-style-type: none"> <li>• Bush Fire Assessment Reports must identify bush fire risks, mitigating measures, and detail compliance with the current version of <i>Planning for Bush Fire Protection</i>.</li> <li>• Biodiversity and ecological values of the land should be identified and protected, as provided for in section 11b Biodiversity conservation.</li> <li>• An Asset Protection Zone (APZ) on slopes greater than 1 in 5, and along ridgelines is unacceptable due to the environmental consequences of clearing such slopes and ridgelines.</li> <li>• Clearing for the purpose of bushfire risk management must be consistent with the <i>Upper Hunter Emergency Risk Management Plan – Natural Hazards</i> and of the current version of <i>Planning for Bush Fire Protection</i>.</li> <li>• Fire resistant plant species and landscaping should be provided for development on Bush Fire Prone Land, in accordance with the requirements of the current version of <i>Planning for Bush Fire Protection</i>.</li> </ul>

## 10b Bushfire risk



### 10b.7 Supplementary guidance

The following documents or reference materials provide further advice or information that is relevant to this section.

NSW Rural Fire Service, 2006, *Planning for Bush Fire Protection*, available at [http://www.rfs.nsw.gov.au/dsp\\_content.cfm?cat\\_id=1047](http://www.rfs.nsw.gov.au/dsp_content.cfm?cat_id=1047)

Upper Hunter Shire Bushfire Prone Land Map

Upper Hunter Emergency Risk Management Plan – Natural Hazards, available at [http://upperhunter.local-e.nsw.gov.au/index.php?option=com\\_contentandview=articleandid=1141121:risk-management-plan-natural-hazardsandcatid=1157andItemid=2345](http://upperhunter.local-e.nsw.gov.au/index.php?option=com_contentandview=articleandid=1141121:risk-management-plan-natural-hazardsandcatid=1157andItemid=2345)

## 10c Geotechnical hazard

### Explanatory outline

Section 10c outlines assessment criteria relating to the management of geotechnical hazards. The following matters are covered:

- requirements for preparation of geotechnical reports
- development on steep slopes, and potential areas of land slip
- areas subject to fill
- land affected by salinity
- construction works

## 10c Geotechnical hazards

### 10c.1 Application of this section

This section applies to development described in Column 1 when carried out on land described in Column 2.

Column 1:	Type of development	Column 2:	Applicable land
	Any development that requires development consent. Does not apply to proposals for which a complying development certificate is sought under State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.		Any land.

### 10c.2 Relevant planning instruments & legislation

The *Upper Hunter Local Environmental Plan 2013* is relevant to development to which this section applies.

Further planning instruments and legislation may also be relevant. In the event of any inconsistency, the *Upper Hunter Local Environmental Plan 2013* will prevail over requirements or criteria contained in this section.

### 10c.3 Definitions

There may be some terms used in this section that are defined in the Dictionary.

### 10c.4 Objectives

The objectives of this section are to:

- avoid development on land subject to geotechnical hazards where possible
- ensure potential geotechnical hazards are appropriately considered in development approvals
- identify requirements for geotechnical studies and reports.



## 10c Geotechnical hazard

### 10c.5 Supporting plans & documentation

Development applications that are subject to this section should be supported by the following plans and documentation.

Item	When required	Plans or information to be provided
A. General requirements	All applications	Refer to section 2c Lodging a development application.
B. Geotechnical hazard assessment	Applications that involve: <ul style="list-style-type: none"> <li>land potentially subject to instability, slip, or other mass movement</li> <li>steep land (slopes generally 1 in 3 or greater)</li> <li>significant land surface disturbance</li> <li>large-scale industrial or commercial development.</li> </ul>	Geotechnical report, undertaken by a suitably qualified and experienced person, that: <ul style="list-style-type: none"> <li>considers all relevant matters relating to the development of the land, as outlined in this section, including on and off-site impacts arising from development</li> <li>includes recommendations to be applied in the approval and construction of the development.</li> </ul>
C. Salinity assessment	Applications that involve: <ul style="list-style-type: none"> <li>land subject to soil salinity</li> <li>land that adjacent to other land known to be subject to soil salinity</li> <li>land within a sub-catchment identified as Very High/High to Moderate salinity risk in the Hydrogeological Landscapes (HGL) mapping by the NSW Department of Primary Industries (Nicholson, et al., 2014) .</li> </ul>	Investigations and sampling for salinity should be conducted in accordance with the requirements of the Office of Environment and Heritage booklet ' <i>Site Investigations for Urban Salinity</i> ' and should be undertaken by a suitably qualified and experienced person.  In areas of salinity affectation, a Salinity Management Plan is to be prepared to guide earthworks and construction of the subdivision. The Salinity Management Plan is to address the following considerations: <ul style="list-style-type: none"> <li>minimising groundwater recharge</li> <li>excavation and soil disturbance</li> <li>construction standards for roads, infrastructure and buildings</li> <li>provision of stormwater management facilities and sub-surface drainage</li> <li>location and scale of landscaping and vegetation planting (based on appropriate modelling) and suitable local plant species (local provenance seed stock).</li> <li>a Salinity Monitoring Plan to monitor both on-site and off-site impacts.</li> </ul>

### 10c.6 Assessment criteria

A performance-based approach will be adopted in the assessment of development applications. Applications will be assessed according to the extent to which the outcomes specified in the left-hand column of the following table will be satisfied or achieved by the design, construction or operation of the proposal.

The design guidelines specified in the right-hand column indicate design and best practice solutions by which the required outcomes can be met. They do not preclude other solutions that may be suitable under particular local circumstances. All proposals will be considered on merit.

## 10c Geotechnical hazard

### Outcomes to be achieved

### Design guidelines

#### A. Land slip & unstable land

- Subdivision and development of land subject to land slip or that is otherwise unstable is avoided
  - Applicants must demonstrate that more suitable alternative development sites are not feasible.
  - Measures recommended in a geotechnical report to reduce or minimise hazard are to be implemented

#### B. Steep slopes

- Subdivision and development of land on steep slopes is avoided.
  - The slope of land proposed to be developed is to be surveyed and determined by a registered surveyor.
- Hazards associated with the development of steep slopes is adequately assessed, and measures are taken to reduce or minimise hazards to an acceptable level.
  - Measures recommended in a geotechnical report to reduce or minimise hazard are to be implemented

#### C. Soil salinity

- Development on saline soils is avoided
  - Identify hazard areas and processes on the site.
- Where a development site is subject to salinity, measures are taken to protect buildings and infrastructure from corrosion associated with saline soils.
  - Reduce water input and maintain natural water balance that limits groundwater rise and through flow.
  - Maintain good drainage and reduce waterlogging.
  - Retain or increase vegetation in strategic areas.
- Development does not significantly increase the salt load in existing watercourses and soils within the catchment.
  - Implement appropriate building controls and engineering responses - concrete foundations, brickwork/masonry products, roads, above ground/ underground infrastructure must be constructed to a standard that appropriately responds to the level of saline conditions affecting the land.

#### D. Construction works

- Works including deep earthworks, and construction on filled land require a geotechnical assessment to identify whether the subject site is suitable for its intended use as part of the development application.

### 10c.7 Supplementary guidance

The following documents or reference materials provide further advice or information that is relevant to this section.

- Australian Geomechanics Society, 2007, *Guidelines for Landslide Susceptibility, Hazard and Risk Zoning for Land Use Planning*, <http://australiangeomechanics.org/resources/downloads/>
- Fallding M, McGhie S, and Nicolson R, 2005, *Land Use Planning and Urban Salinity*, Local Government Salinity Initiative - Booklet No.11, NSW Department of Planning, Infrastructure and Natural Resources
- Nicholson, A., Winkler, M., Eccles, S and Nowakowski, A (2014) *Hunter Central Rivers CMA Hydrogeological Landscapes (HGL) Stage 1 Report*, NSW Department of Primary Industries