

SECRETARY'S CORRESPONDENCE

PRIORITY:

<input type="checkbox"/> URGENT	Date due: / /
<input type="checkbox"/> Early (2 weeks)	

ACTION REQUIRED:

DRAFT LETTER FOR SIGNATURE BY:		
Secretary	(Full brief <input type="checkbox"/> Short Brief <input type="checkbox"/>)	<input type="checkbox"/>
Deputy Secretary		<input type="checkbox"/>
Executive Director		<input type="checkbox"/>
Director		<input type="checkbox"/>
General Manager		<input type="checkbox"/>
BRIEFING NOTES FOR SECRETARY		<input type="checkbox"/>
DISCUSSION WITH SECRETARY		<input type="checkbox"/>
DEPARTMENTAL ACTION		<input checked="" type="checkbox"/>
INFORMATION ONLY		<input type="checkbox"/>
OTHER:		<input type="checkbox"/>

INSTRUCTIONS/COMMENTS

Planning Services
P. Hammarad 4/9/15

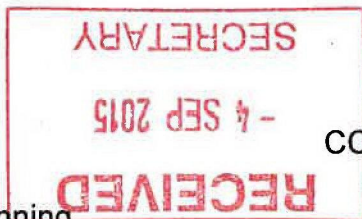


In reply please quote: 14/20306

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3 September 2015

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NSW Department of Planning
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Chief Executive
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PROPOSED AMENDMENTS TO FAIRFIELD LEP 2013 AND CITY WIDE DCP FLOOD CONTROLS – CASE FOR EXCEPTIONAL CIRCUMSTANCES

The purpose of this letter is to set out Councils case for exceptional circumstances under the Section 117 Direction 4.3 (and the associated Guideline) of the NSW EP&A Act 1979 to amend flood related planning controls in the current Fairfield Local Environmental Plan (LEP) 2013 and City Wide Development Control Plan (DCP) applying to land above the flood planning level (FPL) for residential accommodation, commercial and industrial land uses as defined under the NSW Standard Instrument LEP.

It is noted that the above Section 117 Direction does not include specific criteria or requirements that need to be addressed under 'exceptional circumstances'. Rather the issue is dealt with on a case by case basis and places the onus on Council to provide sufficient justification (including technical reasons) for the nature of changes proposed.

Specifically the need for Council to submit a case for exceptional circumstances has been triggered by the following;

- (i). Proposed amendment to Cl.6.4 – Flood Risk Management of Fairfield LEP 2013

Under the current clause 6.4 of Fairfield LEP 2013 – Flood Risk Management, Council proposes to remove reference to the Standard LEP group terms 'commercial premises', 'industries' and 'residential accommodation' and include reference to the individual land use term 'seniors housing' as per Attachment B.

The above amendment is subject to a planning proposal that has been referred to the DP&E requesting a gateway determination under s.55 of the EP&A Act.

(ii). Proposed amendment to Ch.11 – Flood Risk Management of the Fairfield City Wide DCP 2013

Under Chapter 11 of the City Wide DCP, Council proposes to;

- Map and incorporate the new 'very low flood risk' precinct into Chp.11 of the City Wide DCP (Attachment C) where specific flood related development controls only apply to sensitive land uses and facilities within this precinct being those uses listed under the amended cl.6.4 of the Fairfield LEP 2013 (above).
- Amend the Matrices (Attachment D) contained at Chp.11 of the DCP such that there are no flood related development controls applying to residential, commercial and industrial uses above the flood planning level being the level of the 1:100 average recurrent interval (ARI) flood plus 0.5 metre freeboard.
- Embark on a program of education to raise awareness of flood evacuation needs for occupants of residential, commercial and industrial buildings located above the FPL.

Further background and justification in relation to the above is set out in the remainder of this letter.

Previous Case for Exceptional Circumstances

Council's previous case for exceptional circumstances (Attachment E) established the context for applying to controls to development above the FPL across Fairfield City and in summary was based on the following key reasons;

1. Fairfield City has a known and well documented history of mainstream and overland flooding;
2. The controls were required to safeguard future residential development planned under Council's Residential Development Strategy for the City aimed at meeting urban consolidation objectives relevant to the Sydney Region.
4. Potential exacerbation of flooding problem from existing and future detention basin overflow and/or failure, resulting in higher flood levels and flow velocities in downstream areas, with little or no warning.
5. Predicted increased peak flow and floodwater volume due to climate change resulting in higher flood levels and flow velocities.
6. Documented evidence of larger floods greater than 1:100 ARI year flood event in Fairfield City.
7. More rapid rates of rise of flood waters within Fairfield City catchments with little warning time for State Emergency Services to act and the community to respond to any flood warnings.
8. Difficulty with large number of non-English speaking residents within Fairfield City to respond to State Emergency Services advice/instructions.

9. Ineffectiveness of single 100 year ARI based flood planning level to effectively limit the consequences of larger floods.
10. Low risk areas above the 100 year ARI flood level are not necessarily low risk because of potential disastrous consequences (i.e. potential loss of life) from the larger floods, if safe refuges are not available.
11. In certain circumstances it is safer to incorporate "shelter-in-place" in a major flood event to minimise risk to life. The controls requested by Council are required to be able to facilitate this outcome.
12. Need for structural development controls above the 100 year ARI flood planning level to limit risk of structural failure of dwellings and which are used for "shelter-in-place".
13. Valuation studies show that notification to the probable maximum flood level has minimal impact on property values;
14. Research indicates there is increased community support for being informed about flood risk and for local authorities to take action to mitigate flood risk.

On 9 May 2013 Council received correspondence (Attachment F) from the Director General of the NSW Department of Planning and Infrastructure (DP&I) regarding making of the Fairfield LEP 2013. The letter indicated that the DP&I and NSW Office of Environment and Heritage (OEH) supported Council's case for exceptional circumstances that resulted in the current version of cl.6.4 (Attachment A) being included in Fairfield LEP 2013.

In addition the letter also included the following specific advice;

OEH has acknowledged that Fairfield has areas outside the flood planning area, where the flood situation can be considered exceptional (i.e. areas subject to flash flooding and/or evacuation constraints), where planning controls may be appropriate

and

"Council should map areas that are outside the flood planning area that are subject of a flood event that are subject to isolation in a flood event, as well as those areas susceptible to instances of flash flooding. As the Department has previously advised, Council is to implement this action as part of finalisation of Council's City-Wide Development Control Plan"

Council believes the proposed amendments to Cl.6.4 of the Fairfield LEP 2013 and Chp.11 of the City Wide DCP are both consistent and address the above matters raised in the Director General's letter.

The following sections of this letter provide further clarification on the above and justification for Council's case for exceptional circumstances to amend the provisions of clause 6.4 – flood risk management of FLEP 2013 and Chp.11 of the Fairfield City Wide DCP 2013.

Justification for Amendments to LEP and DCP Flood Controls

Council's proposal to vary its flood related LEP and DCP controls above the FPL is directly related to the findings of recent flood studies that have identified areas of the City located above the FPL where flood evacuation and safe occupation of buildings is a key issue.

In addition, Council has also resolved to pursue a new policy position of removing DCP controls from applying to residential, commercial and industrial development located above the FPL and instead embarking on an education program to raise awareness of flood evacuation issues for occupants and landowners located in this part of the floodplain.

In summary the overall justification and rational underpinning the above approach is as follows;

(i) Results of recent flood studies

Recent flood studies undertaken by Council covering the suburbs of Canley Vale, Canley Heights and Wetherill Park have identified areas in the floodplain located above the FPL (up to and including the PMF) where flood evacuation and safe occupation of buildings is not a critical issue in general for residential, commercial and industrial development.

Under the flood studies these areas have been mapped and identified under a new flood risk classification of 'very low flood risk' precinct as shown Attachment C.

In the very low flood risk precinct the depth and velocity of potential flood waters does not warrant the application of controls on general residential, commercial and industrial forms of development.

This outcome also effectively addresses previous advice from the Director General of DP&E (above) indicating Council should map areas that are susceptible to isolation in a flood event.

In response to this matter, Council is proposing to amend cl.6.4 of the Fairfield LEP 2013 by removing reference to *residential accommodation*, *commercial premises* and *industries* so that there is no longer a mandatory LEP requirements for consideration of safe occupation and evacuation from buildings for these forms of development located above the FPL.

To maintain consistency with the current format of Fairfield flood related controls Council is proposing that all maps, detailed description and requirements associated with the very low flood risk precinct will be contained in Chapter 11 of the Fairfield City Wide DCP.

This approach also maintains greater flexibility in being able to consider the merits of a particular development or take into account more detailed site specific flood studies for future development.

Council considers that the provisions of clause 6.4 should still be applied to more sensitive land uses (e.g. hospitals, emergency facilities) given the scale, function and operation of these uses and in many instances the circumstances of occupants of these facilities.

In addition, there is a need to maintain the overarching application of cl.6.4 above the FPL up to the level of the PMF given that the potential future location of these more sensitive land uses within the floodplain is an unknown and needs to be dealt with on a case by case basis.

To ensure consistency with these principles Council is also proposing to incorporate *seniors housing* (a sub category within the definition of residential accommodation) in the list of sensitive uses covered by the provisions of clause 6.4.

(ii) Raising awareness of flood evacuation issues

In addition to the above, at its meeting of the 23 June 2015 Council resolved to pursue a new policy approach of removing flood controls from applying to *residential accommodation, commercial premises* and *industries* located above the FPL which includes development located in part of the low flood risk precinct and all of the very low flood risk precinct as shown in Attachment D.

Under this arrangement under Chp.11 of the City Wide DCP, flood related DCP controls would still apply to a range of sensitive land uses proposed above the FPL up to an including the level of the PMF.

Currently the primary function of DCP controls applying to residential, commercial and industrial development is to require development to address flood evacuation measures including identifying suitable routes for occupants of a building to escape rising flood waters.

Council considers that this approach does not adequately transfer awareness of flood evacuation issues to the occupants of buildings located above the FPL. In addition, information in relation to flood evacuation issues are only applied at DA stage and this does not address the need to raise awareness of flood evacuation issues for the broader community above the FPL up to and including the PMF.

Accordingly Council is proposing to implement a comprehensive education program to address evacuation needs for residents and occupants of residential accommodation, commercial premises and industries affected by flooding with particular focus on flood prone land between the FPL up to and including the PMF level.

Examples of how this may be implemented include but are not limited to;

- Information in Councils City wide newsletter 'City Life' which is sent out to all residents and businesses in Fairfield City on a quarterly basis.
- Mail outs to landowners located between the FPL and PMF with specific tailored information relating to evacuation issues in these areas.
- Information on Council website regarding flood evacuation.

- Specific material/advice included with DA approvals for development located between the FPL and PMF.

In undertaking the above measures Council will continue to liaise closely with the NSW State Emergency Services to ensure actions and measures undertaken by Council are consistent with policies or include input from this Agency.

(iii) Consistency with the Floodplain Development Manual

The NSW Floodplain Development Manual (FDM) provides the overall framework for guiding the development of flood strategies prepared by local government in NSW to manage safe human occupation and use of floodplains having regard to risk management principles contained in the manual.

Council considers that the proposed amendments to Cl.6.4 of the Fairfield LEP 2013 and associated amendments to Chp.11 of the Fairfield City Wide City DCP are consistent with the above facets of the FDM as;

- The proposed changes are associated with detailed strategic investigations into floodplain risk management issues in Fairfield City.
- The proposed changes are consistent with the policy provisions of the FDM of dealing with the merits of development or redevelopment of flood prone land.

Council officers would be happy to meet with the DP&E and OE&H to discuss any of the above issues further. Ultimately the proposed amendments to the LEP and DCP detailed in this letter are designed to provide greater clarity and certainty for flood affected property owners within the Fairfield LGA as well as addressing Council's obligations in managing development within the floodplain.

Please do not hesitate to contact either Andrew Mooney on 9725 0214 or Tim Meaker on 9725 0171 if you would like to discuss any of the above further.

Yours faithfully



Eber Butron

**MANAGER STRATEGIC LAND USE PLANNING AND CATCHMENT
MANAGEMENT**

Attachments:

- A: Existing Clause 6.4
- B: Proposed Clause 6.4
- C: Very low flood risk precinct - mapped
- D: Revised DCP matrix
- E: Previous case for exceptional circumstances
- F: NSW DP&I Director General's Advice – 9 May 2013

Attachment A – Existing Clause 6.4

6.4 Floodplain risk management

1. The objectives of this clause are as follows:
 - a) in relation to development with particular evacuation or emergency response issues, to enable evacuation of land subject to flooding in events exceeding the flood planning level,
 - b) to protect the operational capacity of emergency response facilities and critical infrastructure during extreme flood events.
2. This clause applies to land between the flood planning level and the level of a probable maximum flood, but does not apply to land subject to the discharge of a 1:100 ARI (average recurrent interval) flood event plus 0.5 metre freeboard.
3. Development consent must not be granted to development for the following purposes on land to which this clause applies unless the consent authority is satisfied that the development will not, in flood events exceeding the flood planning level, affect the safe occupation of, and evacuation from, the land:
 - a) caravan parks,
 - b) commercial premises,
 - c) correctional centres,
 - d) emergency services facilities,
 - e) group homes,
 - f) hospitals,
 - g) industries,
 - h) residential accommodation,
 - i) residential care facilities,
 - j) tourist and visitor accommodation.
4. In this clause:

Flood planning level means the level of a 1:100 ARI (average recurrent interval) flood event plus metre freeboard.

Probable maximum flood has the same meaning as it has in the Floodplain Development Manual (ISBN 0 7247 5476 0), published in 2005 by the NSW Government.

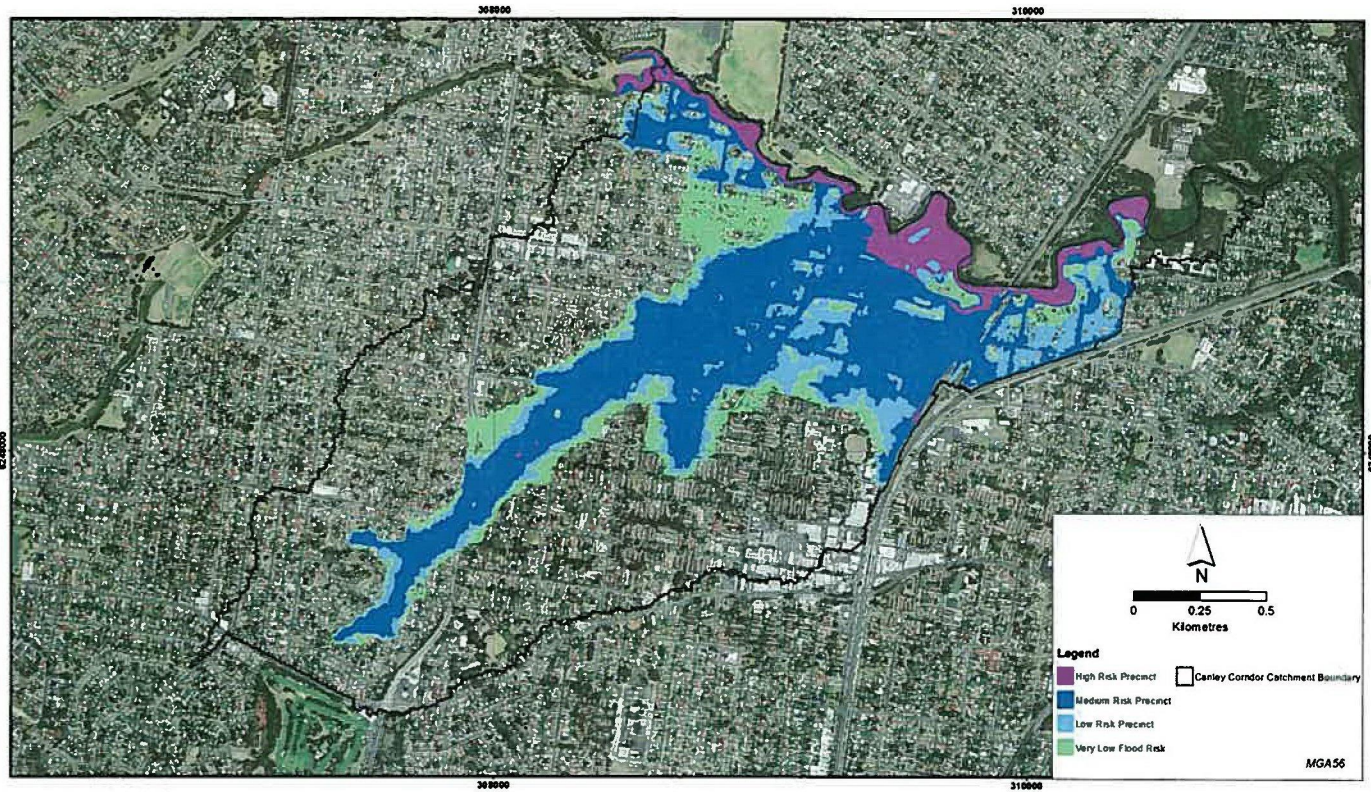
Attachment B – Proposed Clause 6.4

6.4 Floodplain risk management

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 - c) emergency services facilities,
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 - g) seniors housing
 - h) tourist and visitor accommodation.
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Flood planning level means the level of a 1:100 ARI (average recurrent interval) flood event plus metre freeboard.

Probable maximum flood has the same meaning as it has in the Floodplain Development Manual (ISBN 0 7247 5476 0), published in 2005 by the NSW Government.



Canley Corridor Floodplain Risk Management Study: Preliminary Risk Precinct Classification

	<p>Molino Stewart endeavours to ensure that the information provided in this map is correct at the time of publication. Molino Stewart does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.</p>	Date: 04/02/2015	Checked By: S.M	Job No: 0517
		<p>Y:\Jobs\2012\0517 Canley Corridor (Fairfield) FPRMS Filepath:\P\GIS\Workspace\Prelim Risk Precinct.mxd</p>		

Figure 34: Preliminary Flood Risk Precinct Map

Attachment D – Revised DCP Matrix

Table 18: Draft Planning Matrix

Schedule *		FIGURE * Matrix of Prescriptive Controls for Canley Corridor															
Canley Corridor Catchment		Flood Risk Precincts (F/RP's)															
Planning & Design and Controls		Very Low Flood Risk				Low Flood Risk				Medium Flood Risk				High Flood Risk			
		Critical Uses & Facilities	Sensitive Uses & Facilities	Residential	Commercial & Industrial	Residential	Commercial & Industrial	Residential	Commercial & Industrial	Residential	Commercial & Industrial	Residential	Commercial & Industrial	Residential	Commercial & Industrial		
Planning Considerations																	
Flood Level		3	4.7	3	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7		
Building Components		2	1	2	1	1	1	1	1	1	1	1	1	1	1		
Structural Boundaries		3	2	3	2	2	2	2	2	2	2	2	2	2	2		
Flood Effects		2	2	2	2	2	2	2	2	2	2	2	2	2	2		
Car Parking & Driveway Access		1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3		
Evaluation		2.4	5	2.3	2.4	5	2.3	2.3	4.3	2.3	5	2.3	1.3	2.3	4.3		
Management & Design		4.8	1	2.3	4.8	1	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3		
Fencing																	

COLOUR LEGEND: ■ Not Relevant ■ Inhabitable Land Use

General Notes

- Final floor levels are an additional height of 300mm.
- The relevant environmental planning instruments (generally the Local Environmental Plan) identify development permissible with consent in various zones in the LGA. Notwithstanding, constraints specific to individual sites may preclude Council granting consent for certain forms of development on all or part of a site. This matrix identifies where flood risks are likely to determine where certain development types will be considered "unviable" due to flood related risks.
- Items in this table, where applicable to Council, may change the FRP considered to determine the controls applied in the circumstances of individual applications.
- Refer to Section 11.8 of the DCP for planning considerations for proposals involving only the erection of a fence. Any fencing that forms part of a proposed development is subject to the relevant flood effects and Structural Boundaries planning considerations of the applicable land use category.
- Refer to Section 11.10 of the DCP for special considerations such as for houses raising proposals and development of properties identified for voluntary acquisition.
- Terms in italics are defined in the glossary of this plan and Schedule 2 specifies development types included in each land use category. These development types are generally as defined within Environmental Planning Instruments applying to the LGA.
- From time to time Council may adopt mapping showing the Boundary of Significant Flood and/or Flood Storage Areas for this floodplain. Refer to Council to find out if these areas have been defined and mapped for this floodplain.

Flood Levels

- All floor levels to be no lower than the 20 year flood level unless justified by site specific assessment.
- Habitable floor levels to be no lower than the 100 year flood level plus freeboard.
- Habitable floor levels to be no lower than the PFIF level. Non-habitable floor levels to be no lower than the PFIF level unless justified by a site specific assessment.
- Floor levels to be no lower than the design floor level. Where this is not practical due to compatibility with the height of adjacent buildings, or compatibility with the floor level of existing buildings, or the need for access for persons with disabilities, a lower floor level may be considered. In these circumstances, the floor level is to be as high as practical and, when undertaking alterations or additions, no lower than the existing floor level.
- The level of habitable floor areas to be equal to or greater than the 100 year flood level plus freeboard. If the level is impractical for a development in a Business zone, the floor level should be as high as possible.
- Non-habitable floor levels to be equal to or greater than the 100 year flood level plus freeboard where possible, or otherwise no lower than the 20 year flood level unless justified by site specific assessment.
- A restriction is to be placed on the title of the land, pursuant to S 88B of the Conveyancing Act, where the lowest habitable floor area is elevated more than 1.5m above finished ground level, confirming that the underfloor area is not to be enclosed.

Building Components & Method

- All structures to have flood compatible building components below the 100 year flood level plus freeboard.
- All structures to have flood compatible building components below the PFIF level.

Structural Boundaries

- Engineer's report to certify that the structure can withstand the forces of floodwater, debris and buoyancy up to and including a 100 year flood plus freeboard, or a FRPF if required to satisfy evacuation criteria (see below).
- Approval to demonstrate that the structure can withstand the forces of floodwater, debris and buoyancy up to and including a 100 year flood plus freeboard, or a FRPF if required to satisfy evacuation criteria (see below). An engineer's report may be required.
- Approval to demonstrate that any structure can withstand the forces of floodwater, debris and buoyancy up to and including a FRPF. An engineer's report may be required.

Flood Effects

- Engineer's report required to certify that the development will not increase flood effects elsewhere, having regard to: (i) loss of flood storage, (ii) changes in flood levels and velocities caused by alterations to the flood conveyance, and (iii) the cumulative impact of multiple potential developments in the floodplain.
- The flood impact of the development to be considered to ensure that the development will not increase flood effects elsewhere, having regard to: (i) loss of flood storage, (ii) changes in flood levels and velocities caused by alterations to the flood conveyance, and (iii) the cumulative impact of multiple potential developments in the floodplain. An engineer's report may be required.

Note: (1) If a Flood Storage Area has been defined for this floodplain, any filling of the floodplain inside this area (except where this occurs by compensatory excavation), will normally be unacceptable as it will reduce the volume of flood storage available on the floodplain and increase flood effects elsewhere. (2) Even where a Flood Storage Area has been defined, development outside the area may still increase flood effects elsewhere and therefore be unacceptable.

Car Parking and Driveway Access

- The minimum surface level of open car parking spaces or carports shall be as high as practical, and not below: (i) the 20 year flood level, or (ii) the level of the crest of the road at the location where the site has access, (which ever is the lower). In the case of garages, the minimum surface level shall be as high as practical, but no lower than the 20 year flood level.
- The minimum surface level of open car parking spaces, carports or garages shall be as high as practical.
- Garages capable of accommodating more than 3 motor vehicles on land zoned for urban purposes, or enclosed car parking, must be protected from inundation by floods equal to or greater than the 100 year flood.
- The driveway providing access between the road and parking space shall be as high as practical and generally rising in the up-slope direction.
- Where the level of the driveway providing access between the road and parking space is lower than 0.3m below the 100 year flood, the following condition must be satisfied. The depth of foundation on the driveway during a 100 year flood shall not be greater than the larger of: (i) the depth at the road, and (ii) the depth at the car parking space. A levee standard may be accepted for single detached dwelling houses where it can be demonstrated that risk to human life would not be compromised.
- Enclosed car parking and car parking areas accommodating more than 3 vehicles (other than on Rural zoned land) with a floor level below the 20 year flood level or more than 0.3m below the 100 year flood level, shall have adequate warning systems, signage and exits.
- Restraints or vehicle barriers to be provided to prevent floating vehicles leaving a site during a 100 year flood.
- Driveway and parking space levels to be no lower than the design ground/floor level. Where this is not practical, a lower level may be considered. In these circumstances, the level is to be as high as practical, and when undertaking alterations or additions, no lower than the existing level.

Note: (1) A still water flood depth of 0.3m is sufficient to cause a small vehicle to float. (2) Enclosed car parking is defined in the glossary and typically refers to carports in basements.

Evaluation

- Habitable access for pedestrians or vehicles required during a 100 year flood.
- Habitable access for pedestrians or vehicles is required from the building, commencing at a minimum level equal to the lowest habitable floor level to an area of refuge above the PFIF level, or a minimum of 20% of the gross floor area of the building to be above the PFIF level.
- The development is to be consistent with any relevant flood evacuation strategy or similar plan.
- The evacuation requirements of the development are to be considered. An engineer's report will be required if circumstances are possible where the evacuation of persons might not be achieved within the effective warning time.
- Approval to demonstrate that evacuation in accordance with the requirements of this DCP is possible for the individual development arising from the subdivision proposal.

Management and Design

- Approval to demonstrate that potential development as a consequence of a subdivision proposal can be undertaken in accordance with this DCP.
- Site Emergency Response Flood Plan required where floor levels are below the design floor level (except for single dwelling houses).
- Approval to demonstrate that area is available to store goods above the 100 year flood level plus freeboard.
- Approval to demonstrate that area is available to store goods above the PFIF level.
- The storage of materials below the design floor level which may cause pollution or be potentially hazardous during any flood.

***Note: Under the amendment endorsed by Council the above DCP flood controls for the low risk precinct would only apply to development located below the flood planning level (i.e. 1 in 100 year flood plus 500mm freeboard)**

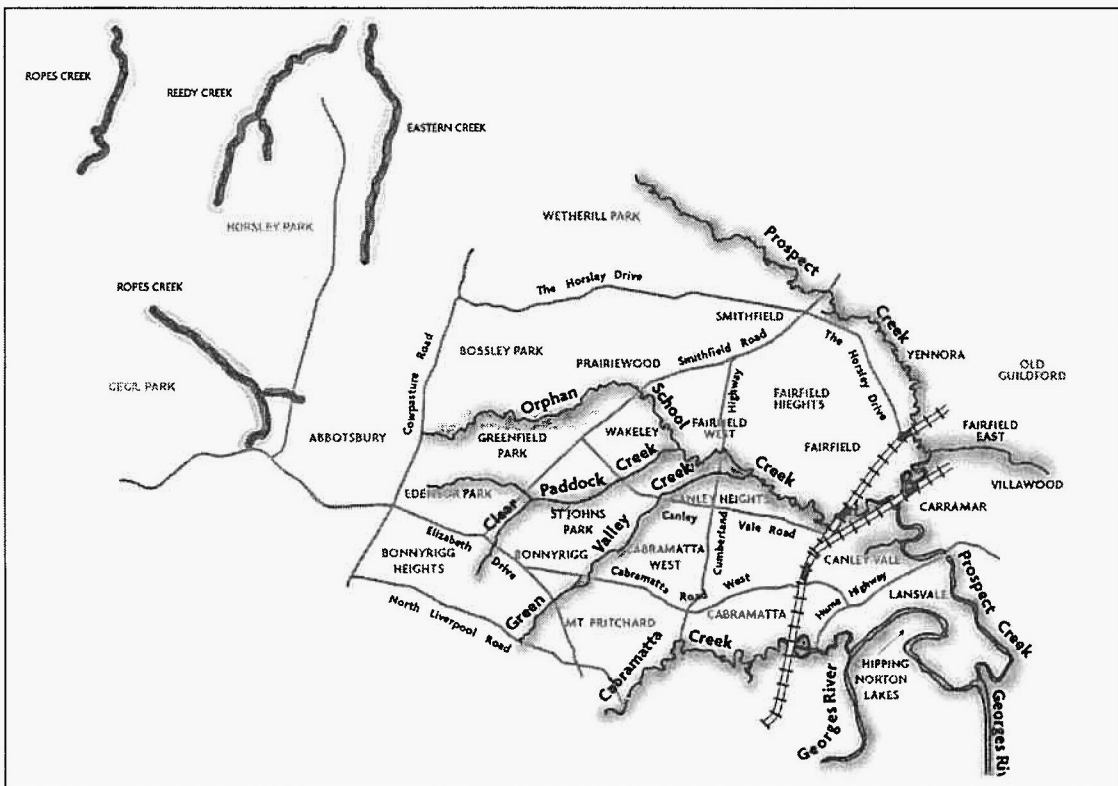
Attachment E – Previous Case for Exceptional Circumstances

1. INTRODUCTION

Fairfield City is located in western Sydney and extends over 100 square kilometres from Prospect Creek and the Georges River in the east to the rural residential areas within the catchment of the Hawkesbury-Nepean River in the west. The city is home to a diverse community of about 190,000 people making it one of the most populated local government areas in NSW.

Over 80 km of creeks cross the city, making the creeks and the riparian corridors that adjoin them, the city's most important natural assets. **Figure 1** below shows the location and extent of the creeks within both the urban areas of the city to the east and the rural areas of city to the west.

Figure 1: Location and Extent of Creeks within Fairfield City



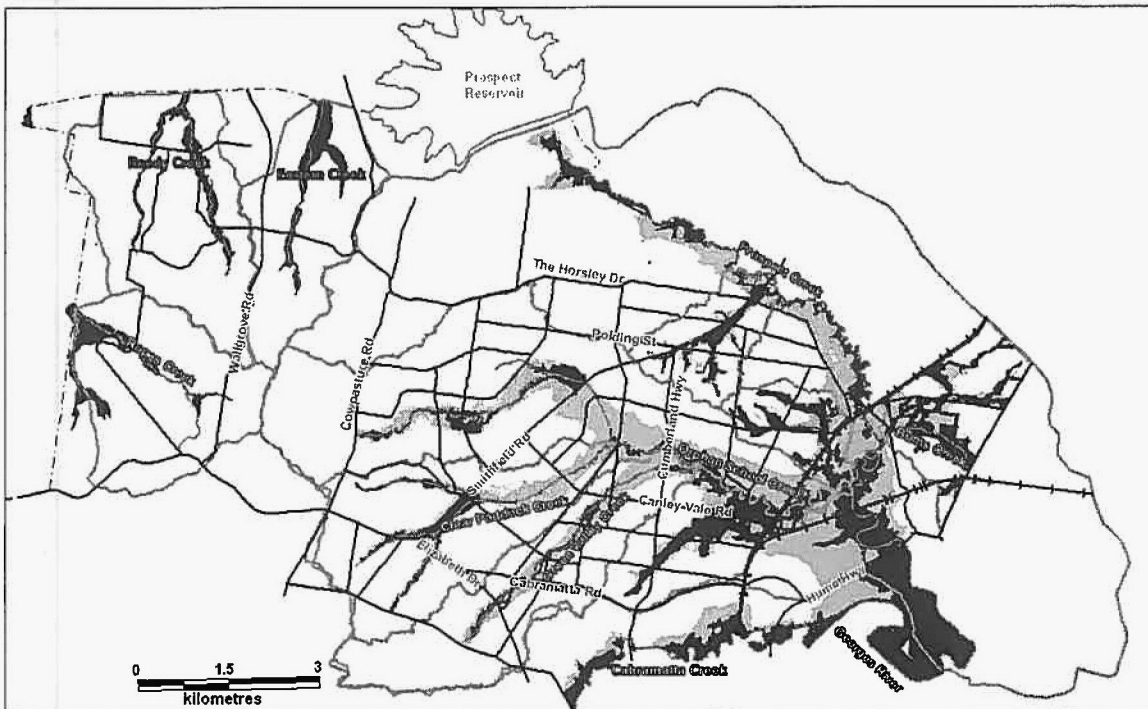
The creeks, and the heavily urbanised local catchments draining to them, are however prone to flooding. The flooding risk in Fairfield City is primarily created by a combination of geography, urban development patterns and the historical delineation of administrative boundaries.

For instance, the administrative boundaries of Fairfield City in the east of the city have been drawn along Prospect Creek to the north and north-east, Georges River to the east and Cabramatta Creek to the south-east. The general area bounded by these three main watercourses was the location for the first urban development in Fairfield City. This development occurred however with little recognition of the threat of major riverine flooding, creek flooding or overland flow flooding. Dwellings in these older and predominantly low areas are highly exposed to concentrations of floodwaters, and potential flood damages and therefore the scale of flood risks to households are high as a result.

Attachment E – Previous Case for Exceptional Circumstances

The above elements taken together have made Fairfield City one of the most flood affected and vulnerable urban areas in NSW. The degree of flood affectation is graphically highlighted in **Figure 2** below. This figure shows the predicted extent of the 100 year ARI flood in dark blue as well as the probable maximum flood (PMF)¹ in light blue. The figure was prepared based on the flood mapping contained in flood studies that Council has undertaken over many years.

Figure 2: Predicted Extent of the 100 Year ARI Flood and the Probable Maximum Flood (PMF)²



2. SEVERITY OF FLOOD RISKS IN FAIRFIELD CITY

As a result of the mainstream flood studies, some 3,700 properties, or about 6% of the approximately 59,000 registered land parcels in Fairfield City have been identified as being at risk from the 100 year ARI flood. This rises to nearly 14,700 properties or nearly 25% of the total number of land parcels, in the

¹ The PMF is the largest flood that can conceivably occur given specified storm and catchment conditions at a given location. It is primarily derived from the probable maximum precipitation (PMP) which 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 climate

² Several points should be noted about this figure. Simultaneous flooding of the creeks within these small catchments, as shown on the figure, is highly likely. However, the figure is based on a 'peak of peaks' mapping whereby the highest flood level from any storm duration is chosen. This means that the full extent of flooding shown in the figure for any creek or catchment will not occur at one point in time in a storm event.

The figure shows the floodplains for only four of the 18 overland flow catchments identified in Fairfield City. Mapping will be continually updated as additional overland flow flood studies are undertaken.

Attachment E – Previous Case for Exceptional Circumstances

PMF and represents a significant increase in the number of properties at risk of flooding above the 100 year ARI flood.

Protecting the lives of residents within such a large number of properties presents significant challenges for a number of important reasons.

- Because of the relatively small size catchments, flooding tends to be of the flash flooding type.
- While there may be limited warning of Georges River flooding, there will be virtually no warning of local catchment and overland flooding due to short response times.
- A high proportion of low lying areas coupled with a large number of creeks and drainage paths will result in rapid and widespread flooding.
- Local roads will be severely affected by flooding and therefore a very high probability that local storms will hinder or impeded emergency responses and evacuation.
- Lack of warning will result in the SES having no ability to assist residents to protect households in a flash flood event.
- Minimum floor controls to reduce flood damage will not be effective in protecting people who cannot evacuate to safer areas.
- In areas severely affected by local flash flooding it will be safer for occupiers to remain in their dwellings provided they can take refuge at or greater than the Probably Maximum Flood (PMF) level.

The suburbs of Lansvale, Carramar, Canley Vale and Fairfield in the east of the city are particularly affected by flooding. These suburbs also contain some of the most socially and economically disadvantaged areas in Sydney. The economic and psychological impact of major flooding on residents in these suburbs will be severe given existing hardships. The recovery from major flooding is also likely to be difficult and prolonged.

Fairfield City is also prone to overland stormwater flooding. This is flooding caused by stormwater runoff from a local catchment that drains through properties towards a creek. This type of flooding can be very hazardous as it is usually characterised by relatively fast flowing floodwaters that rise and fall quickly.

There are some 4400 properties affected by overland flooding in the 100 year ARI event rising to nearly 6400 properties in the PMF. The number of properties identified to be at risk of overland flooding will increase as flood studies continue to be undertaken.

The risk of overland stormwater flooding is greatest in the older suburbs of Carramar, Canley Vale, Fairfield and Fairfield East in the eastern half of the city due to the fact that much development:

- has occurred within overland flowpaths
- extends to the top of bank of, and in some cases over, constructed channels
- has progressed from the bottom of local catchments to the top, meaning that piped drainage systems constructed in the lower catchment are progressively unable to cope with the additional stormwater runoff from development that is constructed in the upper catchment.

Community awareness of overland flooding is much less than for creek flooding, primarily because the source of the flooding cannot be easily identified. For instance, trunk drainage is often buried, while the location of overland flowpaths is not immediately obvious and can be easily altered by developments on a property.

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Yet, the number of properties affected and the resultant damages can be significant. ARMCANZ / SCARM (2000, pg. 2) for instance, report that about 37% of all flood affected properties in urban areas, are effected by overland flooding as opposed to mainstream flooding. Damages from overland flooding represent about 20% of the total urban flood damages.

The number of properties in Fairfield City found to date to be affected by overland flooding in the 100 year ARI event is already greater than the number affected by mainstream flooding. Fairfield City Council is currently commissioning a number of floodplain management studies and plans for overland flow catchments that will quantify the amount of flood damages from overland flooding.

Overland flooding is more widely dispersed throughout a catchment and can be much more difficult to mitigate cost effectively and reliably through structural measures such as drainage improvements and flood works. Long term solutions will need to rely on more appropriate building design to restrict water flow from entering a dwelling e.g. avoid slab on ground construction and though redevelopment to overcome existing problems.

3. HISTORY OF FLOODING

Some 21 mainstream floods have been recorded in Fairfield City since 1809. The history of flooding is illustrated in the flood levels recorded at Lansdowne Bridge which was constructed in 1835 over lower Prospect Creek joining the suburbs of Lansdowne and Lansvale (refer Figure 3 over page).

Figure 3: Recorded Flood Heights at Lansdowne Bridge over Prospect Creek at Lansvale / Lansdowne (Source: Bewsher Consulting 2004)

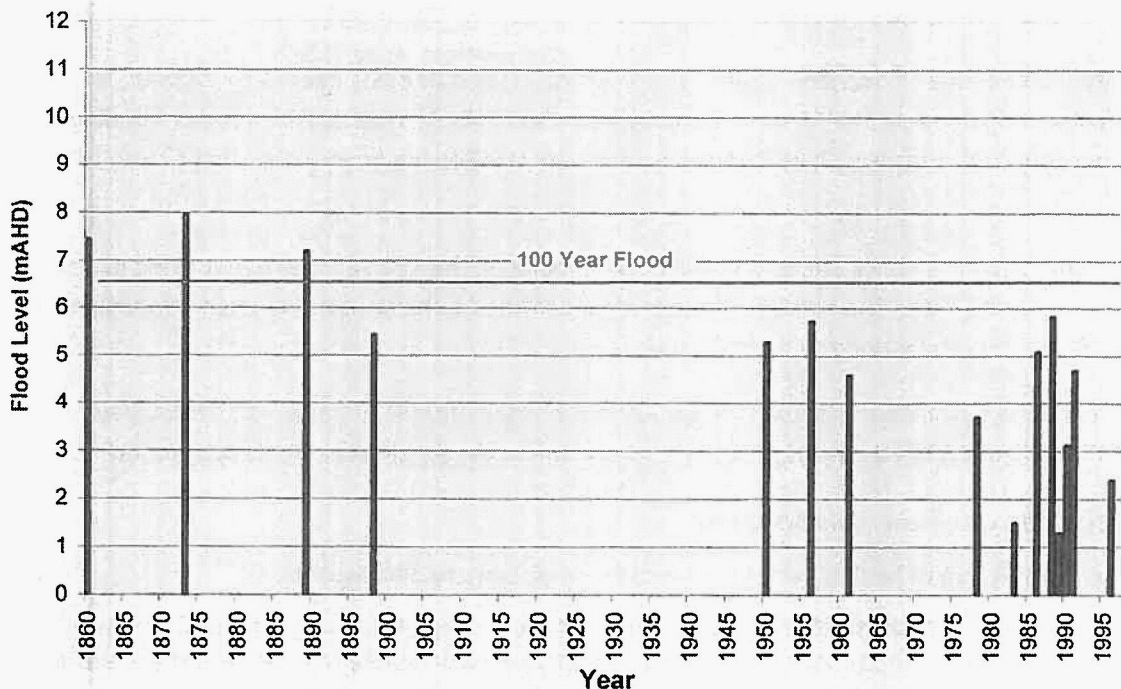


Figure 3 shows that the floods of the latter half of the 19th century were of much greater magnitude than those that occurred in the 20th century. At least three of the floods that occurred in the 19th century were greater than the design 100 year average recurrence interval (ARI) flood.

A number of points can be drawn from the above figure. Firstly, many residents will remember the 1988 and 1986 floods which had an estimated recurrence interval of 20 years. The 1988 flood, for instance,

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inundated over 1000 residential properties along the Georges River, Prospect Creek and Cabramatta Creek and caused over \$40 million in damage (Maddocks 2001). Some long term residents may possibly remember the 1956 flood, but there will be no living memory of the much larger 19th century floods.

The awareness of the potential for floods greater than what has been recently experienced is therefore not high. This is particularly dangerous in the Georges River Valley where the constriction caused by the narrow gorge downstream of East Hills results in a 'bathtub effect' and where the level of the PMF is up to five metres higher than the 100 year ARI flood (Maddocks 2001).

This potential for deep flooding increases the flood hazard significantly, making it unsafe for occupants irrespective of whether they are located below or above the flooding planning level. Floods can rise at a rapid rate and within 9 hours development on the floodplains can become totally submerged. The greater flood depths will also result in much higher damage to houses and expose owners to proportionally higher flood risks and potentially very high insurance premiums.

As noted by Bewsher Consulting (2004, p.15) nothing has happened in the catchment to mitigate major flooding on the Georges River. Indeed, if the same rainfall that produced the 19th century floods was to occur again today, the flooding would likely to be much worse due to there being greater impervious area in the catchment as a result of urban development. Damages would also be greater due to the fact that much development has occurred on the floodplains.

Based on statistical theory and the fact that the last 100 year ARI flood recorded at Lansdowne Bridge on Prospect Creek occurred over 120 years ago in 1889, the likelihood of another 100 year ARI flood occurring on Prospect Creek is approximately 70%.

In addition to mainstream flooding, many severe local overland flood events have been experienced throughout Fairfield City. Again, the suburbs of Smithfield, Fairfield, Fairfield Heights, Fairfield East, Fairfield West, Old Guildford, Canley Vale, Cabramatta, and Cabramatta West are mainly affected.

4. FLOODPLAIN MANAGEMENT IN FAIRFIELD CITY

Fairfield City Council has had a long history of proactively managing the flood risks in Fairfield City. Council's approach has always been in accordance with the NSW Government's Flood Prone Land Policy which was first released in 1984 and which is now described in the NSW Government's 2005 *Floodplain Development Manual* (FDM). A large part of the FDM is devoted to describing a floodplain risk management process which forms the cornerstone of the policy.

Council's role in floodplain management started nearly half a century ago with the Cabramatta Creek Flood Investigation in 1960. Since then, Council has either commissioned or been involved in over 27 major studies on flooding and floodplain management within Fairfield. These include flood studies, floodplain management studies, floodplain management plans, and regular reviews of studies and plans. These studies encompass both mainstream flooding of the creeks as well as overland stormwater flooding from the urbanised catchments draining to the creeks.

In addition to these major studies, numerous site specific flood impact assessments and drainage studies have been undertaken. These have dealt variously with the investigation and design of trunk drainage systems, major flood mitigation works, bridges and creek restoration works. Since the introduction of the first policy on the development and use of flood liable land in 1981, Council has

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regularly updated its flood policy in line with changes to the NSW Government's Flood Prone Land Policy and as new information and practices on floodplain management emerge.

Council's floodplain management process is currently overseen by the Fairfield Floodplain Management Committee. The committee was formed in 1990 and was one of the first committees to be formed in the Sydney metropolitan area. Over the last six years alone the committee has overseen nearly \$10 million in investment in floodplain management. Today, the 18 member committee comprises representatives from the Department of Environment, Climate Change and Water (DECCW), State Emergency Service (SES), three neighbouring councils as well as eight representatives from the local community.

Community members on the committee encompass a wide range of backgrounds, have lived in Fairfield City for many years and are dedicated to representing the interests of the community. Members include ex-Councillors, volunteer flood wardens, retired real estate agents and people active in local community development and environmental volunteering. Many of these community members have had first hand experience of the devastating floods of 1986 and 1988.

Council relies heavily on the input of these community members in the preparation of flood studies and floodplain risk management studies and plans. In particular, Council consults with these community members as well as officers from the SES and DECCW on raising community flood awareness through a combination of flood awareness campaigns, flood notifications and application of development controls related to flood emergency response.

Fairfield City Council has also been an active member of the Floodplain Management Authorities (FMA) of NSW since 1984. The FMA was established in 1961 as forum for local councils, regional authorities and other stakeholders to collaborate and share ideas of flood mitigation and to collectively lobby the NSW and Federal Government for financial and technical assistance in floodplain management (Keys 2008). Council fully supports the comments made by the FMA on the Department of Planning's guidelines (Ezzy 2010).

5. THE MERITS BASED APPROACH TO FLOODPLAIN MANAGEMENT AND THE SETTING OF FLOOD PLANNING LEVELS

To understand the current issues with the setting of flood planning levels and help support Council's claim for exceptional circumstances, it is instructive to briefly review the changes that have occurred in floodplain management policy and practice in NSW over the last three decades. Specifically, this section will examine the move from the simplistic setting flood planning levels to a broader more comprehensive, merits based approach that considers flood risks up to the PMF. The relevance to Fairfield City is highlighted.

The 100 year ARI flood level first became the effective standard for planning purposes in NSW based on a series of NSW Government circulars that were released in 1977. Following strong community reaction, the NSW Government replaced this in 1984 with a 'merits-based' approach to floodplain management described in the Flood Prone Land Policy. The 1984 policy, as documented in the 1986 *Floodplain Development Manual*, specifically noted the deletion of the 1 in 100 definition of flood prone land. That is, the 100 year ARI flood ceased to technically apply as a blanket standard across NSW, a change that appears to have been overlooked by many people for the last 20 odd years (Grech & Bewsher 2007).

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The 1984 policy and 1986 manual were subsequently updated with the release of the 2001 *Floodplain Management Manual*. The Flood Prone Land Policy within the 2001 manual clarified that the merits based approach should be adopted when selecting appropriate flood planning levels. The policy also emphasised the need to address the continuing flood risk so that the full range of flood risks are managed up to the PMF.

The need to consider floods greater than the standard 100 year ARI flood was demonstrated by an estimated 250 year ARI flood on the Bogan River in 1990 which overtopped levees and flooded the town of Nyngan in the central west of NSW.

Although there was ample warning time before the flood, residents had to be airlifted to safety by helicopters. As well, recovery of the town and its key infrastructure post flooding, took an excessively long period of time. This showed a major weakness in over reliance on a singular form of flood protection which was easily overwhelmed by a larger flood event.

It has since been more widely recognised that flood protection works and minimum floor level controls based on one design event cannot eliminate risk and/or be effective over different types of risk. They can only reduce the interval between flooding. They have limited effectiveness as they do not alter vulnerability and consequences which determine the nature and scale of risk. If these are very high and must be avoided e.g. loss of life or unaffordable financial loss borne by individual households, then they must be managed through other and/or additional resources

This need to address the risk of floods greater than the flood planning level was also identified in the *Floodplain management in Australia: best practice principles and guidelines* (ARMCANZ / SCARM 2000, pg. 7). This approach is mirrored by Emergency Management Australia (EMA) in its 1999 *Managing the Floodplain* guidelines.

The need to consider large floods is also supported by Bewsher and Maddocks (2003) who contend that 'rare floods are common'. They document seven floods that have occurred across Australia between 1975 and 1998 that have exceeded 100 year ARI flood levels and, in two cases, approached the PMF.

Further evidence of actual extreme rainfall events approaching the probable maximum precipitation (PMP), which leads to the PMF, is contained in Appendix 3 of the Commonwealth Bureau of Meteorology's 2003 *The Estimation of Probable Maximum Precipitation in Australia: Generalised Short-Duration Method*. Recent severe flooding in Brisbane and Toowoomba has highlighted the need to consider both mainstream and overland floods greater than the 100 year ARI.

The significance of large floods greater than the 100 year ARI flood can be demonstrated within the Prospect Creek floodplain where there is up to a 4.2 metre difference between the 100 year ARI flood level and the PMF level. The increase in flood level from the 100 year ARI flood to the PMF substantially increases the number of flood affected residential properties within the Fairfield LGA from approximately 400 to 3300 properties. Flood damages increase more than tenfold from about \$52 m to \$577 m (Bewsher Consulting 2010).

Structural damage to buildings will increase dramatically once planning controls based on the 1 in 100 year ARI event are exceeded. Structural damage is more costly and takes longer to repair.

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These damages could however be reduced by the continued application of appropriate cost effective controls on residential properties in low risk areas that allow residents to be informed about flood risks as well as what can be done to minimise these.

The 2001 Manual was updated with the release of the 2005 *Floodplain Development Manual*. The 2005 manual continues the practice of addressing the full range of flood risks by stating (pg. G-13):

The definition of the floodplain and flood prone land is based on the PMF event and not on the more limited flood planning area. In this way, the community will be receptive to take action in a flood event than if they thought they were completely protected from flooding by development controls or works.

Somewhat equivocally however, the Flood Prone Land Policy in the 2005 manual has been updated to state that FPLs for typical residential development would generally be based around the 1% AEP event plus an appropriate freeboard (typically 0.5 m). This may have been included to counter perceptions that the increased reference to the PMF would lead to attempts to replace the 100 year ARI flood standard (Grech & Bewsher 2007).

Grech & Bewsher (2007) believe that, although the FPL for residential development could legitimately be (and is commonly) determined to be the 100 year ARI flood level plus freeboard, the inclusion of this direction within the policy conflicts with the intent to allow FPLs to be determined by councils, having regard to the individual circumstances and merits of each floodplain. They suggest that those drafting the inclusion of the 100 year ARI FPL in the latest policy believe that the merits-based approach as originally espoused in the 1984 policy cannot be relied upon to consistently deliver good policy outcomes or alternatively, that the flood risk management process is still not fully understood.

Ezzy (2010) agrees that the FPL should be determined on a catchment basis rather than on the basis of a standardised ARI, while Keys (2008, p.113) suggests that the current guidance is a repudiation of the merits-based approach and a return to the prescriptive approach that was in force pre-1984.

The need for flexibility in setting flood planning levels is acknowledged by the EMA (1999, pg. 14) which states that design flood events that are set for planning and control should not be predetermined but should emerge from the risk management analysis itself. This again is consistent with the NSW Government's merits based approach and also risk management guidelines outlined in AS / NZS 4360:2004.

It is important to note that there are several Australian and international examples where the 100 year ARI flood level has not been adopted as the flood planning level. For instance, a 200 year ARI flood planning level was adopted by Inverell Council for the Macintyre River, for the Torrens River in Adelaide, and for floodplains in Scotland. Even larger floods are set as the design standards for many western European countries (DNR 2006) in light of the consequences considered.

In addition to the above issues, there are other more fundamental concerns with setting a single flood planning level. These are well summarised by Romano et.al. (1999) and are based on the fact that it is difficult for councils to apply the diverse suite of development controls available (e.g. controls on floor levels, emergency response, building design, etc), to the full range of flood risks, using only a single flood planning level. Some of the problems with the single flood planning level are:

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- lack of recognition that flooding can occur above the flood planning level
- polarisation of the floodplain into perceived ‘flood prone’ and ‘flood free’ areas
- the inability to nominate alternative flood planning levels to different landuses (e.g. open space versus critical facilities) and to different floodplains within the local government area (e.g. mainstream versus overland flow floodplains), depending on the consequences of being affected by flooding
- creation of a political climate where the redefinition of the flood planning levels (say due to more accurate data on flood behaviour) is opposed by some sections of the community due to concern over impacts on property values.

In acknowledging these problems, Fairfield City Council has adopted a planning matrix approach to controlling development which does not rely on the definition of a single flood planning level. This planning matrix approach was first developed as part of the 1998 *Hawkesbury-Nepean Flood Management Strategy* and continues to be recommended in the 2007 *Managing Flood Risk Through Planning Opportunities* document.

The history and application of the planning matrix approach to development control in Fairfield City is discussed in **Section 7** below. Notwithstanding the above issues, it is important to note that Fairfield City Council has to date, adopted the 100 year ARI flood level plus 500 mm freeboard for the majority of the development controls contained within the planning matrix.

6. INTERPRETING THE DEPARTMENT OF PLANNING GUIDELINES

DOP (2007) states that the *Guideline on developments on low risk area – Floodplain Development Manual* should be read as part of the *Floodplain Development Manual* and that Council will need to follow both the manual and the guideline in order to gain liability protection under Section 733 of the *Local Government Act 1993*. These statements suggest that the principles of the guideline and the manual are consistent when, in Council’s opinion, they are actually not. This observation is also supported by Ezzy (2010).

DOP and DNR (2007, pg. 1) note in the *Guideline on Development Controls on Low Flood Risk Areas – Floodplain Development Manual*, that the safety of people is one of the key issues that should be considered in the floodplain management process. DOP / DNR go on to note that, despite stating development controls should not apply in areas above the residential FPL, the safety of people and associated emergency response management needs to be considered.

Council considers that flood risk management issues needs to be consideration for all residents within the floodplain. This is particular relevant due to the fact that SES and other emergency response agencies will rely on the majority of residents to self-evacuate in the event of any flood. Without the application of certain development controls regarding flood warning and evacuation, people in low flood risks areas are less likely to respond to evacuation directions and are less likely to know what to do. This ultimately compromises the safety of those people during floods.

Not permitting development controls to be applied in low risk areas also ignores the fact that many vulnerable residents e.g. seniors or disabled people, live in normal residential dwellings, rather than purpose built group homes or seniors living accommodation. The aggregated number of seniors living in this situation in Fairfield City is likely to be much higher than those living in purpose built accommodation.

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The value of controls on evacuation for new development in low risk areas also needs to be considered. This evidence is discussed further in **Section 7** and **10**.

7. THE RATIONALE FOR AND APPLICATION OF DEVELOPMENT CONTROLS IN LOW FLOOD RISK AREAS

The development controls given in Chapter 11 of the *Fairfield City-Wide Development Control Plan* were first developed as part of the work of the Georges River Floodplain Management Committee (GRFMC). This committee was formed to guide the preparation of the *Georges River Floodplain Risk Management Study and Plan*, and comprised representatives from the councils of Fairfield, Liverpool, Bankstown and Sutherland, the SES, the then Department of Infrastructure, Planning and Natural Resources (DIPNR), and community members.

One of the major achievements of the GRFMC was the preparation of uniform development controls for the Georges River floodplain and their subsequent adoption by the four councils, which previously had diverse approaches to managing flood prone land. The development controls for Fairfield City were adopted in 2006, prior to the release of the Department of Planning circular, guideline and planning direction in 2007. The controls developed as part of the *Georges River Floodplain Risk Management Study and Plan* were based on the matrix planning approach as previously discussed. Of the 39 controls developed, there are currently only three that apply to residential development within the low risk area of the Georges River floodplain.

The first two controls relate to flood evacuation. These controls are intended to ensure that adequate flood warning time is available to allow safe and orderly evacuation without increased reliance upon the SES or other authorised emergency services personnel. The development must also be consistent with any local flood evacuation strategy such as the 2005 *Fairfield Local Flood Plan*, prepared by the SES and Fairfield City Council.

These controls are particularly important in the suburbs of Lansvale and Carramar where there are a high proportion of vulnerable residents who may find it more difficult than most residents to evacuate during times of flood. This includes elderly or infirm residents, single parent families and residents on very low incomes. The difficulties in evacuating these residents are expressly acknowledged in Annex B of the *Fairfield Local Flood Plan*.

The number of elderly residents in Fairfield City as a proportion of the total population will also increase, following national trend towards an aging population, thereby placing an additional strain on SES and emergency service personnel to evacuate these residents during times of flood.

Fairfield City is also one of the most multi-cultural local government areas in Australia, where 32% of the population do not speak English well or at all. Lansvale and Carramar are certainly representative of this cultural diversity. Some residents in these suburbs come from countries where flooding is an accepted part of life and where emergency response is much more limited than in Australia.

This again presents difficulties for the SES and other emergency service personnel when attempting to communicate the threat of flooding and when directing these residents to evacuate during floods. It also highlights the fact that issuing direct instructions during flood times and conducting flood awareness campaigns during non-flood times are not, by themselves, sufficient to ensure resident safety.

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Fairfield City Council would argue that controls placed on new developments in these suburbs, particularly when tailored to local language groups and customs, are an important and necessary part of flood emergency response.

These controls are particularly important to apply to medium and high density residential developments where new residents, who would be expected to have very limited awareness of the local flood history or flood behaviour, are being placed in the floodplain. This is discussed further in **Section 8**. The accommodation of new residents in medium to high density developments is likely to place additional strain on the limited resources of the SES and other emergency service personnel during flood times. It is again considered essential that flood warning and evacuation systems are installed as part of new developments to complement and support the activities of the SES and emergency service personnel.

The need to ensure that the flood emergency response measures for new developments are consistent with the Fairfield Local Flood Plan is important, as the plan contains important information for development proponents and residents about the threat of flooding in Fairfield. This includes information on how flooding occurs, which roads become inundated by floodwaters and actions to be taken during floods.

In practice, the controls regarding emergency response in low risk areas are not considered onerous for proponents to comply with. For instance, having clear, well-worded and culturally appropriate signage regarding flood warning and evacuation is one of the most cost-effective measures and one that can be readily incorporated with other signage that is installed within and around the development.

Fairfield City Council and the Fairfield Floodplain Management Committee have also recognised flood evacuation as an issue within the Cabramatta Creek and Prospect Creek floodplains. Controls for development on these floodplains stipulate that reliable access should be provided from dwellings in low risk areas to an area of refuge above the PMF level.

However, in recognition of the differences in flood behaviour between the Georges River and its tributaries, controls in the *Fairfield City Wide DCP* related to the Cabramatta Creek floodplain, allow development proponents to provide flood refuge on site so that residents can 'shelter-in-place' during flood events. The same development controls have been proposed as part of the *Prospect Creek Floodplain Management Plan Review* (Bewsher Consulting 2010) however these controls are yet to be included in the *Fairfield City Wide DCP*, pending the outcome of Council's case for exceptional circumstances.

The above demographic factors and short flood response times will result in little or no effective warning for residents to evacuate, thereby increasing risk to life. The projected increase in population densities will add to this risk considerably. Furthermore, for evacuation to be effective, it needs to be timely and orderly with people confident in the knowledge that their route and destination will remain safe.

The fact that the SES will not be able to offer any warning and be able to assist residents in a flood emergency, means that residents must be given an ability to save themselves in these situations, it is safer for residents to remain in their dwellings during the short flood event than to attempt to move out of the floodplain. Forcing people to flee their homes in dangerous flood conditions, possibly during the night time would actually increase the risk of injury and drowning.

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For this strategy to be feasible, residents must be able to take refuge at a level above the probable maximum flood (PMF) level and buildings must be designed and constructed to remain structurally sound during events up to the PMF. This is feasible and readily achievable in multi storey dwellings, particularly in medium and high density developments

A study “Analysis of Community attitudes to Flood Related Risk” carried out for the Hawkesbury Nepean Floodplain Management Steering Committee by Gutteridge Haskins and Davey and Cox Consulting in 2001 found that

- The community expects responsible authorities to know about likely natural hazards and to ensure adequate community protection from potential damages arising from these natural hazards; and
- Householders are generally willing to pay for protection measures so long as they are well informed of both the risk they face and the likely effectiveness of the measures being proposed.

Further, there are grounds to expect that if councils and other authorities introduce controls in order to discharge their duty of care, the community will be prepared to accept them and any reasonable, associated financial consequences.

Council is currently investigating the need to apply ‘shelter-in-place’ principles to other catchments within Fairfield City. This is discussed further in **Section 10**. Regardless, Council will continue to consult closely with members of the Fairfield Floodplain Management Committee about the most appropriate development controls to apply in individual catchments throughout the city.

In a continuation of the merits-based approach, the Fairfield City-wide DCP has been structured such that it allows for controls to be implemented for individual catchments. Again, this is important in Fairfield City where the city is subject to major riverine flooding from the Georges River, mainstream flooding from the creeks and local overland flooding from the catchments draining to the creeks.

The second control that applies to residential development in the low risk area of the Georges River floodplain relates to the consideration of the impact of a proposed development on flooding. The control is intended to ensure that a development will not increase the risk of flood elsewhere having regard to loss of floodplain storage, alteration of flood conveyance and the cumulative impact of multiple developments within the floodplain.

For most residential developments in low risk areas this is not likely to be an issue. However the control was included to give Council the flexibility of ensuring that development that did have the potential to have an adverse impact could be appropriately controlled. For example, medium to high density development that used filling to raise floor levels could alter flood behaviour to the detriment of neighbouring properties. Council has intended to apply this control in all mainstream and overland flow catchments.

The control also gives Council the opportunity to consider the cumulative impact of residential development on flood behaviour. This means, that although one development by itself may not significantly affect flood behaviour, multiple developments over many years may have a large cumulative impact. This issue of cumulative impact is particularly important to consider in Fairfield City given the amount of residential development that is predicted to occur over the next two decades.

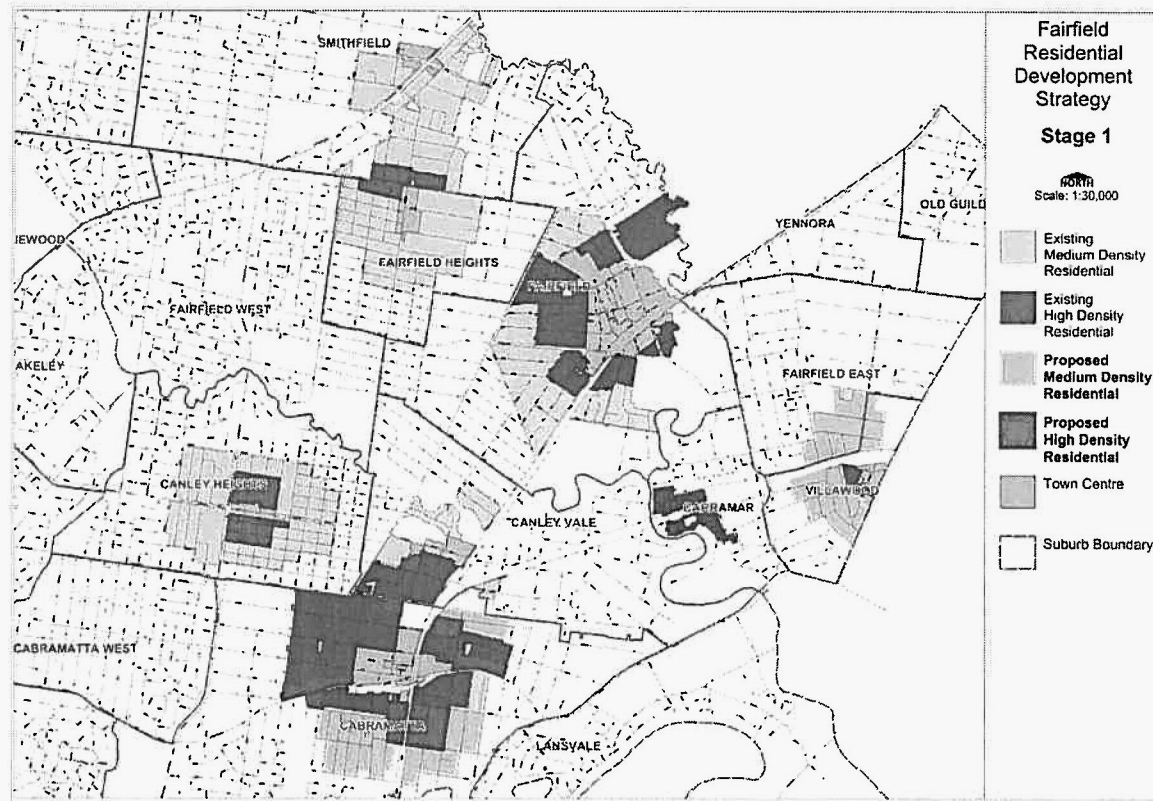
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8. FAIRFIELD DRAFT RESIDENTIAL DEVELOPMENT STRATEGY

Under the NSW Government’s 2005 Metropolitan Strategy for Sydney and associated draft 2007 West Central Subregional Strategy, Fairfield City will be expected to accommodate an additional 24,000 new dwellings by 2031. In response to this target, Council has developed a draft Residential Development Strategy (RDS) for the City which aims to accommodate approximately 60% of new dwellings will occur in the eastern half of the City.

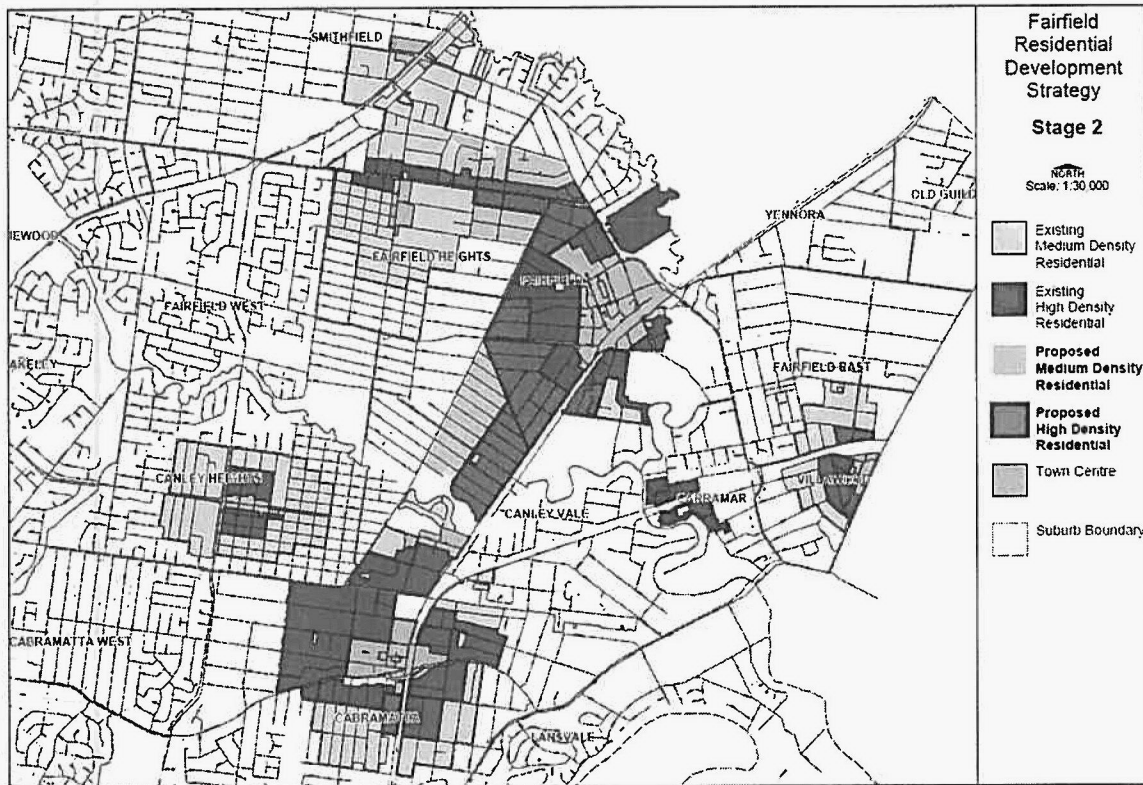
Under the draft Fairfield RDS, it is proposed to up-zone a number of existing residential areas of the City, in two stages, for medium to higher density housing, located primarily around a number of town centres and along public transport corridors. Figure 4 and Figure 5 below show the first and second stages of this rezoning respectively. The first stage of the current Fairfield RDS is being incorporated into the current draft Fairfield Principal LEP, which has recently been referred to the Department requesting permission to place the document on public exhibition.

Figure 4: Extract from Fairfield Residential Development Strategy – Areas Proposed to be Rezoned for Medium to Higher Density Housing – Stage 1



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Figure 5: Extract from Fairfield Residential Development Strategy – Areas Proposed to be Rezoned for Medium to Higher Density Housing – Stage 2



In preparing the draft Fairfield RDS, Council has taken account of the current knowledge on flood risk in Fairfield City when identifying areas for rezoning. However, the extent of new residential development expected is such that some of this will be located in low flood risk areas, particularly around the suburbs of Fairfield and Canley Vale.

To ensure the safety of new residents, Council should be allowed to continue to apply the current development controls in the Fairfield City Wide DCP. This becomes even more important in light of need to continue to accommodate future population growth.

Council is now seeking permission from the Department to include the proposed flood risk management clause, as shown in **Attachment A**, in the draft Fairfield Principal LEP.

9. COMMUNITY ENGAGEMENT

Fairfield City Council has had a long and successful history of engaging with the Fairfield local community on flood related matters. In particular, Council has spent considerable time and effort in addressing community concerns over flood notations as part of its floodplain management process. These are apparently the same concerns that the Department of Planning (2007) stated were the reason for introducing the new guidelines, as discussed above.

The Georges River Floodplain Management Study and Plan project is one example. As part of this project the GRFMC decided to proactively inform residents who were at risk of flooding up to the PMF. As described by Bewsher & Maddocks (2003), approximately 7000 residents living within the Georges River Floodplain and a further 6000 residents within the Prospect Creek floodplain were informed that

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they may be at risk of flooding. In addition, a series of 10 workshops were held, three of which were in Fairfield City, to explain the project and address questions.

In contrast to the adverse community reaction that had occurred in the early 1980s following the release of floodplain mapping, the information provided by the GRFMC by post and through the workshops was reasonably well received. One issue that was raised concerned the impact on property values of the application of flood-related development controls or the public notification of flood affectation. This issue was researched by Yeo (2003) who concluded that the balance of evidence from Australia and internationally, suggests that flood notification has little impact.

Yeo (2003) reported on a study undertaken by Egan National Valuers in 2000 for the NSW Government appointed Hawkesbury Nepean Floodplain Management Steering Committee into the effect of flood notification via Section 149 certificates in the Blacktown, Penrith and Hawkesbury local government areas. It was found that the robustness of the housing market meant that individual property characteristics were stronger determinants of price than flood notification.

These findings could also be expected to hold true for the Fairfield local government area. Another study reviewed by Yeo (2003) that commented on the impact of the 1986 Georges River flood, found the initial fall in property values lasted only for a couple of months. Ultimately, any serious, permanent impact on the real estate market was outweighed by high population growth and housing shortages.

As part of the ongoing preparation and public exhibition of flood studies and floodplain risk management studies and plan, Fairfield City Council continues to inform all property owners, whose properties have been identified to be at risk of flooding up to the PMF. This is done by letter, and which includes a list of answers to frequently asked questions about the flood threat and flood notifications. Council also holds public workshops and information sessions during the public exhibition of draft flood studies reports and draft floodplain risk management studies and plans.

Council regularly consults with the Fairfield Floodplain Management Committee as to the most appropriate and effective way of engaging with the Fairfield community on flood related matters. Most recently, Council is discussing with the committee new ways to raise the level of flood awareness, outside of the normal public exhibition of flood studies and floodplain risk management studies and plans.

The result of this ongoing community engagement is that the level of flood awareness will be expected to steadily increase. Property owners in low risk areas who have been consulted will then better understand the need for development controls related to flood emergency response. Council is ultimately confident that development controls related to emergency response could continue to be applied in low risk areas without undue community concern.

10. CURRENT INVESTIGATIONS

Fairfield City Council is conducting a number of investigations which are likely to have implications for the control of development in low flood risk areas. These investigations relate to climate change, detention basin safety and 'shelter- in place'.

Climate change is one of the most significant issues of our time and one that is predicted to have an impact on flooding. As part of the *Prospect Creek Floodplain Management Plan Review*, Council has examined the impact of increasing rainfall intensities on flood levels in Prospect Creek, in accordance

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with current DECCW guidance. This investigation found that flooding is sensitive to small increases in rainfall intensity. A 10% increase will raise the 100 year ARI flood levels on lower Prospect Creek by up to 0.4 meters.

Council has also undertaken research into the impact of inter-annual and multi-decadal cycles on rainfall in Fairfield and the implications for hydrologic modelling that is used in undertaking flood studies. The research confirms that there is significant climatic variability such that the design rainfall currently used in hydrologic modelling could be underestimated. This research has pre-empted the work by Engineers Australia in updating *Australian Rainfall & Runoff*, which are the national guidelines by which flood studies are undertaken.

Council is commissioning additional investigations into how these results should be considered within the floodplain management planning process, and specifically how current development controls may need to be updated. For example, adding an additional freeboard for climate change and climatic variability may be one solution. Council is concerned that the current Department of Planning guidelines, by restricting the flood planning level to the 100 year ARI flood level plus 0.5 metre freeboard, do not allow Council the flexibility to adopt an additional freeboard to account for these changes.

One alternative to setting an additional freeboard is to redefine the 100 year ARI flood extent by incorporating climate change and climate variability within the flood modelling and floodplain mapping. The problem with this approach is that the climate science in the field of hydrology is evolving extremely quickly. This means that Council would need to update and re-run its hydrologic and hydraulic models and re-map the floodplain on a regular basis, something that is extremely resource intensive.

At this stage, it is considered much simpler to define a single freeboard for climate change and climate variability and to modify that freeboard as new information is obtained. It is suggested that the Department of Planning clarify as soon as possible how climate change and climate variability is to be considered by councils in setting flood planning levels.

Fairfield City Council maintains 19 flood detention basins throughout the local government area. These basins have been designed and constructed over the last three decades in order to help mitigate the increased risk of flooding that is a result of increased urban development. Legal advice obtained by Council indicates that the potential failure or overtopping of these basins in extreme floods should be considered as part of Council's normal floodplain management planning process (De Silva et.al. 2010).

To this end, Council has commenced undertaking a basin safety review and preparing a floodplain risk management study and plan for the Three Tributaries catchment, which encompasses 14 flood detention basins. The three tributaries are Orphan School Creek, the largest tributary of Prospect Creek, and Clear Paddock Creek and Green Valley Creek, which are tributaries of Orphan School Creek.

The Three Tributaries floodplain management study in particular will examine the impact of flooding resulting from the possible failure or overtopping of these basins, and how this type of flooding interacts with and potentially reinforces the impact of regular mainstream flooding. As part of this project, Council will examine what development controls might need to be applied to protect residential development that is at risk of flooding resulting from basin failure.

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Given that most of the flood detention basins have been designed to accommodate a 100 year ARI flood and will overtop and/or fail in floods greater than this, most of the new development controls recommended for downstream development will need to apply in areas that are currently defined as low risk.

The failure of a detention basin occurs rapidly, leaving very little if any time for warning or evacuation. Council must therefore apply controls to allow affected residents to 'shelter-in-place' as it is impractical to evacuate through floodwaters to flood-free ground. Shelter-in-place means that residents would move to a higher level within their building (which need to be structurally designed to safely withstand the force of floodwaters and weakened by immersion) and wait until floodwaters recede. Evidence presented by Hayne et.al. (2009) suggests that in some circumstances, safe evacuation or movement in the flood zone may not be possible and that it may be safer to shelter-in-place.

Shelter-in-place may also prove to be the safest and most cost effective emergency response option for new development in low flood risk areas within overland flow catchments. This is because the critical storms causing peak flooding in overland flow catchments in Fairfield are not restricted to daytime, usually of less than two hours duration, leaving little time for warning and provide no opportunity for evacuation. Shelter-in-place is preferable to evacuation, given that evacuation through overland flow is often unsafe (Hayne et.al. 2009) particularly if there is no daylight.

As additional residents are progressively accommodated in the floodplain, there will be even less capacity for local roads to convey vehicles away from floodwaters, further supporting the case for shelter-in-place.

Council has commenced a number of floodplain risk management studies and plans for its local catchments that will examine the need of shelter-in-place. Council is concerned that the current Department of Planning guidelines do not allow Council the flexibility of adopting a shelter-in-place strategy for current low risk areas if this is the only feasible option as part of the floodplain risk management planning process.

11. CONCLUSION

This submission sets out detailed information in support of Council's case for exceptional circumstances to be able apply controls under its new Principal LEP on development in low risk areas to ensure safe occupation and evacuation utilising the proposed local clause contained in **Attachment A**.

In brief the key issues in support of Council's case are:

- Fairfield City is one of the most flood affected urban areas in NSW due to a combination of unique geography, urban development patterns and administrative boundaries. This has resulted in nearly 36% of the 59,000 registered land parcels within the city being affected up to the PMF. Flood behaviour varies widely across the city meaning properties can be subjected to major riverine flooding from the Georges River, mainstream flooding from five main creeks and local overland flooding from 18 catchments draining to the creeks.
- Prospect Creek, a major tributary of the Georges River, has experienced three floods in the 19th century that were greater than the 100 year ARI flood and much greater than any flood in living memory. Damages would be much greater today if the same events were to reoccur. There is now a 70% chance of a 100 year ARI flood occurring on lower Prospect Creek.

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- Flood damages for properties within the Prospect Creek floodplain are estimated to range from \$52 million in the 100 year ARI event to \$577 million in the PMF. The consequences of floods greater than the 100 year ARI are therefore high, but damages can be reduced without hindering new development by applying controls to new development in these low risk areas that minimise catastrophic losses such as destruction and structural failure of buildings.
- The older suburbs of Lansvale, Carramar, Canley Vale and Fairfield in the east of the city are at the greatest risk, from both mainstream and local overland flooding. These suburbs contain some of the most socially and economically disadvantaged areas in Sydney. Without adequate development controls, new residents may be even less able to cope with the economic and psychological impact of major flooding and unlikely to be able to afford flood insurance if the risks remains very high.
- Fairfield City Council has a long and successful history of addressing flooding through the floodplain risk management process and in accordance with the NSW Government's Flood Prone Land Policy. Based on the work of the Georges River Floodplain Management Committee in 2003, Council adopted a planning matrix approach to development controls in lieu of using the more limited flood planning level. Controls related to flood emergency response in low risk areas have been successfully implemented and applied to individual catchments, prior to the release of the Department of Planning's guidelines in 2007.
- Development controls related to flood emergency response in low risk areas are particularly important in Fairfield City where there is an increasingly high proportion of vulnerable residents, low income households and residents who speak little or no English. These controls are an essential complement to flood awareness campaigns and the activities of the SES and other emergency service personnel during times of flood.
- The Sydney Metropolitan Strategy and draft West Central Sub-Regional Strategy, identify a target of an additional 24,000 dwellings for Fairfield City by 2031. Under Council's Fairfield City draft Residential Strategy up to 60% of these dwellings will be located in the eastern half of the City around town centres and along transport routes. Some of the locations identified for rezoning, such as around Fairfield and Canley Vale, are affected by flooding. It will be critical for new residential development, particularly medium and higher density development, to have adequate safeguards to mitigate the impact of flooding for new residents.
- Fairfield City Council regularly consults with the local community on flood related matters. For instance, as part of the Georges River Floodplain Management Study and Plan, 6000 residents living within the Prospect Creek floodplain up to the PMF were notified that they may be affected by flooding. Research conducted in western Sydney has also found that flood notification via the section 149 process has little impact on property values. Council is confident that development controls related to emergency response and flood impact could continue to be applied in low risk areas with little impost on development proponents and without causing undue community concern.
- Fairfield City Council is currently examining the impact of climate change, climatic variability and the possible failure of existing flood detention basins, on flooding. Council needs to have the flexibility to be able to control development in low risk areas that may be affected by increased flooding from climate change or basin failure, for example through the use of an additional freeboard or shelter-in-place policies.

Attachment E – Previous Case for Exceptional Circumstances

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Attachment F – Advice from Director General - 9 May 2013



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FAIRFIELD CITY COUNCIL

20 MAY 2013

TO:	D. Cuthbert
FROM:	10/02884
DATE:	AS 90532
TIME:	15:704/2013
BY:	20/5/13

Alan Young

Dear Mr Young

Fairfield Local Environmental Plan 2013

I refer to Council's submission under the *Environmental Planning and Assessment Act 1979* ('EP&A Act'), requesting that the Minister make Fairfield Local Environmental Plan [2013] ('the LEP').

I am writing to notify you that as the Minister's delegate, I have made the LEP under section 59(2) of the *EP&A Act*, and under section 34(5), it will take effect 14 days after the date it is published on the NSW Legislation website.

The LEP will update and rationalise planning controls by providing a principal LEP for the Fairfield Local Government Area, provide for additional housing and jobs, and implement the recommendations of Council's strategic work.

In considering the Plan, I have made a number of revisions to the draft LEP, as submitted under (former) section 68 of the *EP&A Act*, to respond to government agency submissions, reflect the latest model clauses, and to ensure consistency with legal drafting convention, relevant SEPP's and the most recent version of the Standard Instrument LEP.

Council's rationale for the proposed deferral of certain land in Fairfield Heights and Smithfield from the LEP is supported, and this change has been reflected in the LEP.

In regards to the inconsistency of the LEP with s.117 Direction 4.3 *Flood Prone Land*, as you are aware, the Office of Environment and Heritage (OEH) has indicated its support for the inclusion of provisions in the LEP which seek to regulate certain development on land above the 1% Annual Exceedance Probability. OEH has acknowledged that Fairfield has areas outside the flood planning area, where the flood situation can be considered exceptional (ie. areas subject to flash flood and/or evacuation constraints), where planning controls may be appropriate.

In light of the above, I have determined that Council's case for exceptional circumstances is justified and have subsequently included a modified local flood risk management clause (cl.6.4) in the LEP. This clause contains provisions which seek to

Attachment F – Advice from Director General - 9 May 2013

mitigate the flood risk to development in the Fairfield LGA that is located in areas between the flood planning level, and the level of probable maximum flood.

The Department supports OEH's views on this matter and its comments that Council should map areas that are outside the flood planning area that are subject to isolation in a flood event, as well as those areas susceptible to instances of flash flooding. As the Department has previously advised, Council is to implement this action as part of the finalisation of Council's City-Wide Development Control Plan.

Council should also be aware that I have agreed that the draft LEP's inconsistencies with section 117 Directions '3.2 Caravan Parks and Manufactured Home Estates', and '6.2 Reserving Land for Public Purposes' are justified, and are of minor significance. No further approval is required in relation to these Directions.

There are a number of post-exhibition changes proposed by Council which I have decided not to include in the LEP. These are:

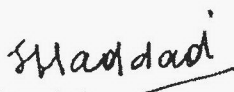
1. the inclusion of 'neighbourhood shops' as a prohibited use in the zoning table for the R1, R3 and R4 Residential, and IN1 and IN2 Industrial zones; and
2. the inclusion of 'shop top housing' as a prohibited use in the R1 and R4 Residential zones; and

Council's requested prohibition of 'neighbourhood shops' in the proposed R1, R3, R4, IN1 and IN2 zones and 'shop top housing' in the R1 and R4 zones under the LEP is not supported as these are mandated permissible uses within the respective zones.

I commend Council for the work undertaken to prepare the LEP and appreciate Council's co-operation in delivering this Plan.

Should you have any questions regarding this matter, I have arranged for Mr Peter Goth, Director of the Department's Sydney West Regional Office, to assist you. Mr Goth may be contacted on telephone number (02) 9860 1174.

Yours sincerely



Sam Haddad
Director-General

9/5/2013