ABSTRACT

Fairfield City Council now applies a risk management approach to managing its floodplains and has adopted a performance based Flood Risk Management Policy. This includes a matrix of prescriptive planning controls relating to factors such as floor levels and building components that vary with land use type and flood risk. This Policy is similar to those now adopted by many local Councils across NSW.

This paper will review how such policies have evolved and been applied particularly in the high risk areas of floodplains. This paper will discuss the advantages and disadvantages of the performance based DCP and the manner in which land use restrictions in areas of high flood risk is being approached. The need for this review stems from the anecdotal concern that the DCP is misinterpreted by the public who continue to purchase parcels of land in high flood risk areas with the misconception they may be developed despite the constraints of high flood hazard and evacuation.

This paper will conclude by discussing ways in which the planning controls might be formulated to better inform our residents of their flood risk and provide an effective basis to development control. Is the performance based DCP doing it’s job or is there too much room to manoeuvre our way back into developing the high flood risk areas? Should these areas be sterilised for ever in the interest of our residents? What principles should be applied in answering these questions?

INTRODUCTION

In the last 10 to 20 years there has been an increasing emphasis on producing planning controls as a means of managing flood risks with a corresponding decreasing reliance on engineering solutions. This has lead to the introduction of relatively detailed flood risk management controls within planning policies administered by many local Councils across NSW, in comparison to controls (or lack thereof) that existed prior to this period. The guidelines contained within the Development Control Plan (DCP) of the Fairfield City Council is one example, which is similar to the controls adopted by approximately 30 other Councils.

Planning control systems are now commonly addressing flood risk management and the majority of town planners in NSW support this outcome. This trend is clearly a positive reversal of the preceding situation where strategic planning and development assessment provided nil or superficial attention to (sometimes potentially devastating) flood risks. However, we have now reached a stage where it is important

1 Grech & Bewsher 2007
2 Grech & Bewsher 2007, pg.9
to review this new wave of planning controls to determine if there are ways to ensure they are better understood and more effectively implemented. Fairfield City Council has been at the forefront of such new planning controls and consequently their DCP provides a relevant focus for this paper.

THE EVOLUTION OF FLOOD POLICIES

Floodplain risk planning policies were effectively non-existent between European colonisation of NSW and 1958 when the state government issued a brief policy statement following severe flooding\(^3\). The transferral of floodplain risk management responsibility from state to local government in 1984 and the introduction of the first of 3 Floodplain Development Manuals in 1986 created for the first time a platform for the introduction of effective flood risk management strategies within planning controls. At this time, local Councils were reaching a threshold where planning was receiving recognition as an important discipline following the introduction of the Environmental Planning and Assessment Act in 1980, and planning controls generally were becoming more comprehensive and sophisticated.

Floodplain Risk Management Plans prepared by Council's under the framework of the Manual during the 1980’s to early 1990’s commonly included recommendations in regard to the introduction of basic flood related planning controls such as minimum floor levels but normally limited considerations to the 100 year floodplain. During the later 1990s to present, such Plans began to introduce a more comprehensive package of controls which reflected a graded set of planning controls across the entire floodplain (that is up to the probable maximum flood), varying with the vulnerability of different land uses and incorporating a range of considerations such as evacuation, building materials, structural soundness and effect on others in the floodplain\(^4\).

The evolution of the sophistication of planning controls in general was reflected in flood related controls. This included a movement to performance based controls and incorporation into an integrated package (such as a comprehensive DCP) which include flood related considerations together with all other matters relevant in the determination of development proposals. The Fairfield DCP is typical of such contemporary comprehensive packages of planning controls. As such, the strengths and weaknesses associated with contemporary planning are inherited by flood related controls but with added specific issues as explored below.

CHARACTERISTICS OF MODERN FLOOD POLICIES

The planning system in NSW includes many layers of planning controls from the more broadly applicable State Environmental Planning Policies and Regional Environmental Plans produced by the state government, to local council initiated Local Environmental Plans which establish the statutory zoning base and DCPs which provide more detailed control. DCPs normally incorporate the core of flood related controls. However, DCPs remain subservient and can on occasion require the support of the higher order planning instruments to implement recommendations of Floodplain Risk Management Plans such as the prohibition of certain land uses in areas of unacceptably high flood risk.

\(^3\) Grech & Bewsher 2007, pg.5
\(^4\) Romano Grech & Bewsher 1999.
Consistent with contemporary planning controls in general, modern flood risk management policies incorporated within a DCP commonly exhibit the following characteristics:

- Derived from strategic studies that provide some researched basis as opposed to the more traditional approach of assigning standards that are based on a technical person’s view of what is reasonable or copying from another jurisdiction.
- Incorporation of public consultation during the process of formulating the controls.
- A specific statement of what the objectives of the controls are.
- Consistent with traditional planning controls, prescriptive controls are specified, providing numerical or clearly quantifiable standards against which a development proposal can be evaluated.
- Specification of performance criteria, which are intended to qualitatively identify the outcome which the prescriptive standards are intended to achieve.
- A process for the on-going monitoring and review of the controls, sometimes by a specific commitment to review the controls after a certain period or the nomination of a sunset date for the expiry of the controls.

Given that some floodplains have an extensive flood range, and given the difficulty in addressing the associated variability in flood risks with simple rules, the use of the planning matrix approach was developed.\(^5\) The approach identifies where within the floodplain differing land uses are likely to be acceptable or not and proposes controls on development to minimise the flood consequences as depicted in Figure 1 below.

![Figure 1: Distributing Land Uses under the Planning Matrix Approach](image)

Using this approach, a matrix of development controls, based on the flood hazard and the land use, can be developed which balances the risk exposure across the floodplain. This approach was adopted as part of the Hawkesbury–Nepean Flood Management Strategy\(^6\) and has now been applied to almost 30 local government areas in NSW.

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\(^5\) Bewsher & Grech 1997

\(^6\) Bewsher Consulting and Don Fox Planning 1997.
The planning matrix and other similar approaches requires the categorisation of the floodplain into areas of like risk. The diagrammatic definition of the precincts extending away from the riverine source of flooding and their implications for planning controls are depicted on Figure 2 below.

### Low Flood Risk
- Risk of damages are low
- Modifications to building structures are not cost effective
- **No development controls on most uses**

### Medium Flood Risk
- High risk of flood damages without substantial modifications to building structures & other planning controls
- **Main area development controls applied**

### High Flood Risk
- Significant erosion risk to foundations of buildings & collapse of building structures likely and evaluation difficulties which may result in a higher risk to life
- **Most uses restricted**

**Figure 2: Application of Planning Controls In Floodplain**

Flood policies based on the above rationale were first included in Fairfield’s Flood Policy in November 2004, then formally adopted as a Flood Risk Management policy in November 2005 and finally incorporated into their City Wide DCP in July 2006.

Consistent with the above, the Fairfield DCP employs a performance based approach to controlling development in the floodplain and a graded set of planning controls which varies with land use. A critical element of the DCP is to include a list of uses considered unlikely to be acceptable in each of the flood precincts of the floodplain, with most uses being identified as unsuitable in the high flood risk precinct

### PROBLEMS AND ISSUES

Experience with the application of the Fairfield DCP for past 3 years has identified 2 fundamental issues that warrant review:

1. Whether the balance between prescriptive controls and the certainty it brings versus performance criteria and consequent flexibility is right.

2. Whether it is necessary to prohibit the majority of land uses in the high flood risk precinct as opposed to fostering the sometimes unrealistic expectation that a particular proposal can prove to be acceptable by satisfying critical performance criteria.

### Prescriptive Versus Performance Controls

The issue of prescription and certainty versus the flexibility of outcome based performance controls is a perennial debate engulfing all issues manifested in planning controls not just those related to flood risks. Reliance on prescriptive controls can be satisfactory where development proposals are not complex and
assessment resources are limited. However sole reliance on prescriptive controls is not considered to be ideal. The emergence of performance criteria as best practice was a reaction to inappropriate development arising as a consequence of the perfunctory application of numerical standards without considering whether their underlying intent were satisfied. Performance criteria were also seen as a way of establishing a regulated system to review requests for variations to fixed standards. It is also impractical to consider that planning controls can impose a numerical prescription to every conceivable development scenario, while if carefully constructed a performance control can provide guidance in every situation. The Fairfield DCP, has embraced the performance based approach, inclusive of its flood risk management component.

Philosophically all development should be required to satisfy performance criteria regardless of whether the prescriptive criteria are met. It is paramount to ensure that development achieves the underlying intent of a standard regardless of whether the prescriptive controls are met. For example, it would be illogical to assess a proposal to be acceptable if it achieved minimum floor heights but significant risks to human life remained due to the depth of inundation in slightly rarer flood events and evacuation was not possible.

There is no doubt that performance based controls require greater skill and time to implement. However there is also no doubt that if carefully utilised performance based controls can provide superior outcomes. The use of prescriptive controls in conjunction with performance criteria allows for a balance to the efficient assessment of minor development proposals where the issues are simple and the minimal assessment is warranted, as opposed to more complex proposals where the development outcomes require careful review. Performance criteria should not be seen as a variation but as an equal (or superior) means of achieving the same objective of a prescriptive criterion.

To improve the skilfulness of the assessing officers, Fairfield City Council invested in training both development planners and engineers. Such training provides an important mechanism for the intent of the controls, as envisaged by the policy formulators, to be explained. Greater professional competency and experience in the implementation of performance criteria should see greater consistency and acceptance by the development industry, the community, politicians and the Court.

**Land Use Prohibition or Merit Based Flexibility**

A basic planning outcome of traditional exclusionary zoning practice is to prohibit specific land uses in areas where underlying studies determine they are unacceptable. The Development Activity Forum established to provide guidance on development assessment processes states the following simple but fundamental principle:

“Development that is not appropriate in specific locations should be clearly identified as prohibited in the ordinance or regulatory instrument so that both proponents and consent authorities do not waste time or effort on proposals that will not be approved. It should not be necessary to submit an application to determine that a proposal is prohibited.”

The decision to prohibit land uses can often be politically difficult particularly when such land uses have been historically permitted in an area or there has been an expectation for zoning changes to facilitate future urban development. This difficulty

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7 DAP 2005, pg. 32)
is accentuated when the sole issue for which land use prohibition is recommended is flooding as opposed to the full range of planning considerations. For example a flood study could identify a significant risk with intense urban development in an area which is of strategic importance due to a location adjacent to a public transport node, and on balance it is decided that development is allowed due to overriding economic and social interests. The consequence is that flood risks alone rarely lead to a decision to prohibit uses within zoning plans, even if the ultimate outcome is to continually reject proposals at the development application stage.

The question arising is when should land uses be prohibited because of flooding? The following are some basic principles that we have identified as important in answering these questions.

- The floodplain risk management study should probe the community and analyse the economic and strategic planning impact of prohibiting the majority of land uses in the high flood risk precinct. As the high flood risk precinct is an area where the majority of land uses are considered undesirable from a flood risk perspective, the option of using zoning controls to prohibit uses should be loudly debated and carefully evaluated.

- The broader strategic planning intentions of an area need to be considered. If it is critical to economic development to allow urban development in an area initially identified as high flood risk, then there may be a need to reconsider the criteria for determining high flood risk (e.g. adopting a lower probability flood or elevating a structural engineering solution). A basic tenement of the NSW flood risk management process is the need to determine what is acceptable flood risk relative to individual floodplains based on a balance between economic, social and environmental considerations.

- To fully understand economic and social impacts, the area affected by a high flood risk categorisation should be carefully reviewed to determine the implications for individual allotments. Where the topography of an area creates relatively narrow floodplains a high flood risk corridor may only affect a small portion of individual properties thereby allowing some development potential. In broader floodplains the whole of individual properties may be affected.

- A sensitivity analysis should be conducted to determine if it would be probable that development in a high flood risk precinct (and indeed all parts of the floodplain) could satisfy basic flood risk management objectives. If a land use is not prohibited and the opportunity is allowed for the lodgement for a development application, then performance criteria and prescriptive controls will nonetheless need to be satisfied before an approval will be issued. If this analysis reveals that it is improbable that a land use could satisfy controls that would need to be met for a development to be acceptable than clearly it is inappropriate to create false expectations.

It is important to ensure that the implications of a floodplain risk management plan are clear to the community and decision makers. If flood risks dictate a recommendation that land uses should be prohibited that should be stated. It is undesirable to disguise such prohibitions behind an array of development controls that create defacto prohibitions as this just inappropriately delays a fundamental strategic planning decision to the development application stage. However to determine if land use prohibition is the answer it may be imperative to effectively engage in a comprehensive planning study to determine whether such land uses are of such economic, social and strategic planning importance that higher flood related risks are tolerable.
Having formed a decision to prohibit land uses, there are 2 implementation mechanisms the authors have investigated in past studies.

1. **Standard zoning controls that prohibit land uses outright.**

   These are potentially in the form of a specific zoning category (such as a Rural or Environmental Protection zone) within which most land uses are a prohibited or specific clause in a planning instrument that effectively prohibits land uses by reference to an overlay on zoning maps that identifies areas affected by significant flood risk. The latter approach is that which is advocated by the NSW Department of Planning through the process of preparing standardised local environmental plans currently required of all local councils. This mechanism is suited to broader floodplains where the whole of properties are likely to be affected.

2. **Setback controls that restrict development with parts of properties.**

   These controls are suited to narrow floodplains where it has been assessed that individual properties are only partially affected by high flood risks and adequate site areas exist to allow for reasonable development potential. To carry greater statutory weight these controls are preferably imbedded within local environmental plans as opposed to development controls plans and could for example invoke the use of foreshore building line provisions more traditionally used in coastal areas.

The final form of the zoning and planning controls must be logical when viewed as independent planning decisions. It is not sufficient to conclude that the majority of land uses are unacceptable due to flood risks without understanding what land uses are acceptable. This may necessitate greater interaction with the general planning process to encourage feedback as to the importance or not of developing areas of high flood risk. Where it is ultimately determined that most forms of development are unacceptable, then the planning process should positively nominate alternate uses which can be considered in the detail planning of an area. In some cases an equitable outcome would be for the identification of an area within a voluntary purchase scheme or as public open space requiring its acquisition.

In the Fairfield case the first option would be the most appropriate. In hindsight, the scope of the preceding Floodplain Risk Management Study did not allow for the depth of analysis required as discussed above to provide a definitive position for the prohibition of land use. The continual process of monitoring and review could allow for this to be addressed in the future.

**CONCLUSION**

The flood risk management process in NSW requires a merit based assessment in the formulation of flood related planning controls. Current best practice suggests that these controls will normally involve the prohibition of most land uses in areas of high flood risks and the imposition of performance based controls where development is considered acceptable in principle subject to being able to demonstrate how flood risks are to be appropriately managed. Flood risk is only one factor in many to consider when formulating planning controls and the decision to a consequence of prohibiting land uses must be analysed within a broad planning framework to be able to determine the optimum planning solution that truly balances, economic, social and environmental considerations in the manner envisaged by the NSW Floodplain Development Manual.
TAKE HOME MESSAGES

1. Floodplain Risk Management Plans must ensure they formulate policies that are capable of integration into contemporary planning instruments.

2. Performance based DCPs represent current best practice and this is likely to remain the framework for DCPs into the foreseeable future.

3. A sensitivity analysis is required of policies recommended by Floodplain Risk Management Plans to determine whether the recommended controls are likely to result in any land use being determined to be unacceptable irrespective of foreseeable ameliorative controls considered by individual development applications.

4. Those land uses that are found to be unavoidably unacceptable by a sensitivity analysis should be prohibited by higher order planning instruments (normally the local environmental plan). However strategic planning must go further to determine what land uses are desirable in such areas and whether equity considerations dictate that the land should be acquired by the public through a voluntary acquisition program or as open space.

5. If the prohibition of such uses is seen to be politically unsupportable for social or economic reasons then the fundamentals of the Floodplain Risk Management Plan should be revisited to re-evaluate what risks are acceptable. This outcome suggests that such development is either acceptable to the community or the flood related risks were not properly understood.

REFERENCES


