IS 1 IN 100 ENOUGH?

Floodplain Manager, Vol 2, No. 3: June 2006

While a merits based approach to floodplain management has been advocated in Australia for many years, the 1 in 100 flood continues to be used to set not only residential floor levels but to design critical infrastructure. However, recent large scale natural disasters across the globe have brought into sharp focus the need to acknowledge that a "one size fits all" is inappropriate for floodplain management.

At the annual FMA conference in February of this year, Larry Larson, Executive Director of the US Association of State Floodplain Managers (ASFPM), noted that the levees in New Orleans were designed to be overtopped in a flood which has a 1 in 100 AEP. This is the standard used for all levees throughout the USA and behind the levees there are no planning controls.

The devastation of New Orleans has raised questions about the wisdom of this approach. The failed New Orleans levees were protecting the city from storm surge, not from the Mississippi River. Given that much of the city is several metres below sea level, the consequence of levee failure is that the water continues to flow in until the breach is repaired. The depth and speed of the resulting floods was such that over one third of buildings will have to be rebuilt.

But it is not only the nature of the flooding in New Orleans that calls into question the wisdom of a 1 in 100 design level. The size, complexity and economy of New Orleans itself has made evacuation, temporary accommodation, rebuilding and alternative employment mammoth tasks which have stretched, and in some cases exceeded, the world's largest economy's ability to cope.

In the first 35 years of the USA's flood insurance scheme there had been a total of $15 billion in claims but from hurricanes Katrina and Rita alone there have been $23 billion. Yet only $2 billion in premiums is collected each year.

New Orleans also highlighted the need for critical infrastructure to have a higher level of protection than other assets. For example, following Katrina only two out of eight hospitals remained functioning, and all hospitals stored supplies in their basements or ground floors.

Larson said, "Currently the government is reconsidering its levee policy and wondering whether 1 in 200 or 1 in 500 should be adopted as its standard." He said ASFPM policy is that: "Levees should only be used to protect existing development and then only as a last resort. Where levees exist, landuse behind the levees needs to be regulated."

By contrast, at the same conference, Adri Verwey of Delft Hydraulics in the Netherlands gave some insight into how the Dutch approach the issue of protecting major cities from floods and storm surge.

There, more than 10 million people live below sea level and Dutch law mandates that a minimum of a 1 in 1,250 year protection must be given to all land. However, most

of the country has levees which provide protection up to a 1 in 4,000 event and the major cities of Amsterdam and Rotterdam have 1 in 10,000 year protection.

Despite this high level of protection, the Dutch are reviewing their standards in light of Katrina and the extreme floods throughout Europe in recent years (such as the 1 in 500 event on the Elbe in 2002) which have claimed more than 100 lives per year since 1998. The Dutch are carefully reviewing the probabilities of levee failure and estimating the consequences of failure to provide a risk rating for each of the 53 leveed districts.

This is being repeated in other European countries. For example, Italy has embarked on a program of resident relocation and levee upgrading in the Po Valley. The aim is to have all habitable structures behind levees designed to hold back a 1 in 500 year event. This followed the near overtopping of the levee system in 2000.

This pattern of upgrading flood protection only after a devastating flood or a near miss has been repeated many times in Australia.

A good case in point is Nyngan in western NSW. Nyngan's levees were overtopped by a 1 in 200 event in 1990 that flooded the whole town. All 2,500 residents were evacuated by helicopter and could not return for several weeks. Subsequently the levees were raised and strengthened to exclude such an extreme event in the future.

It may, or may not, prove an appropriate level of protection for that small, isolated rural town. If it is appropriate, then using Dutch logic, major cities and economic centres should be afforded a higher level of protection. Yet large parts of Brisbane and Ipswich, much of the Gold Coast, large swathes of Western Sydney and important inland cities in Victoria would be crippled by a 1 in 100 flood let alone a 1 in 200 event.

With the Victorian Manual of Floodplain Management and Policy under review and the Queensland State Government drafting its own Floodplain Management Manual it is an opportune time to reinforce and encourage a true risk based approach to floodplain development throughout Australia.