

LEGISLATIVE FRAMEWORK FOR NATURAL HAZARDS

The following discussion is provided based on the legislative environment at the time of publication (August 2013). As legislation is expected to change in regards to hazard management towards the end of 2013 (i.e. Resource Management Act reforms), this section will be updated to reflect any changes. The following discussion is an updated version of that provided in Saunders & Beban (2012). It includes an overview of the current legislative framework; definitions of natural hazards within legislation; roles and responsibilities; the New Zealand Coastal Policy Statement; risk reduction and the Civil Defence Emergency Management Act; and reconciling avoidance, mitigation, and risk reduction under the Resource Management Act.

1. CURRENT LEGISLATIVE FRAMEWORK

In New Zealand, no one agency is responsible for natural hazard management. Rather, a number of organisations including the Ministry of Civil Defence Emergency Management (MCDEM), regional councils, territorial authorities, civil defence emergency management groups, and engineering lifeline groups hold these responsibilities (MfE, 2008). Co-operation between these agencies is essential to ensure a streamlined and holistic national approach to planning for disasters.

There are four key pieces of legislation that have a primary influence on natural hazard management in New Zealand: the RMA, Building Act 2004, Civil Defence Emergency Management Act 2002 (CDEMA), and Local Government Act 2002 (LGA). The four key statutes are intended to be integrated in their purposes, which all promote sustainability, as shown in Table 1. Other statutes also contribute to natural hazard management, to a lesser degree. These include the Local Government Official Information and Meetings Act 1987 (LGOIMA), by allowing hazard information to be available for all parcels of land, through a Land Information Memorandum (LIM); Environment Act 1986; Conservation Act 1987; Soil Conservation and Rivers Control Act 1941; Land Drainage Act 1908; and the Forest and Rural Fires Act 1977 (see Tonkin & Taylor, 2006, for further information).

Apart from the LGA, the purposes of the statutes in Table 1 are consistent in that they have a focus on sustainable management or development, and refer to the social, economic and cultural well-beings, as well as health and safety. However, while sustainable management is defined under the RMA, it is not defined in the CDEMA; sustainable development is also not defined in the Building Act or LGA. Also, balancing of the four well-beings is not required; rather, economic considerations can take priority over social, environmental and cultural well-beings. This priority reflects the political prerogative to encourage market solutions to the management of natural and physical resources (Ericksen, Berke, Crawford, & Dixon, 2003).

Given this non alignment between the various pieces of legislation with the definition of sustainable management, the following section outlines the definitions of natural hazards within these statutes.

Table 1 Purposes of key legislation for the management of natural hazards (emphasis added).

Statute	Purpose
Resource Management Act 1991 (Part 2, Section 5)	To promote the sustainable management of natural and physical resources. <u>Sustainable management</u> means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their <u>social, economic, and cultural wellbeing</u> and for their <u>health and safety</u> .
Building Act 2004 (Part 1, Section 3)	To provide for the regulation of building work, the establishment of a licensing regime for building practitioners, and the setting of performance standards for buildings, to ensure that— (a) <u>people who use buildings can do so safely and without endangering their health</u> ; and (b) buildings have attributes that contribute appropriately to <u>the health</u> , physical independence, and <u>well-being</u> of the people who use them; and (c) people who use a building can escape from the building if it is on fire; and (d) buildings are designed, constructed, and able to be used in ways that promote <u>sustainable development</u> .
CDEM Act 2002 (Part 1, Section 3)	To improve and promote the <u>sustainable management</u> of hazards in a way that contributes to the <u>social, economic, cultural, and environmental well-being and safety</u> of the public and also to the protection of property
Local Government Act 2002 (Part 1, Section 3)	To provide for democratic and effective local government that recognises the diversity of New Zealand communities

2. DEFINITIONS OF NATURAL HAZARDS

While the purposes of the four statutes are intended to be integrated and consistent, the definitions of natural hazards vary. While the LGA does not define natural hazards, they are defined under the RMA, Building Act and CDEMA, as shown in Table 2.

While the Building Act is limited to certain phenomena, the RMA and CDEMA have unlimited definitions, both of which are consequence driven (i.e. may adversely affect human life, property; may cause or contribute to an emergency). This allows for consequences (and associated vulnerabilities, susceptibilities etc.) to be assessed. The implication of this difference in approach with defining natural hazards is often not fully appreciated by land use planners, building officers, or emergency management officers, and can lead to inappropriate decisions being made. It is therefore important that the linkages between the statutes is understood and integrated between roles (planners, emergency management officers,

building officers etc.). The following section outlines these linkages, roles and responsibilities.

Table 2 Legislative definitions of natural hazards

Statute	Definition of natural hazard	Comment
Resource Management Act 1991	Any atmospheric or earth or water related occurrence (including earthquake, tsunami, erosion, volcanic and geothermal activity, landslip, subsidence, sedimentation, wind, drought, fire, or flooding) the action of which adversely affects or may adversely affect human life, property, or other aspects of the environment.	Under Section 106, a consent authority may refuse to grant a subdivision consent, or may grant a subdivision consent with conditions, if it considers that the land, and any subsequent use of the land or any structure is or is likely to accelerate, worsen, or result in material damage to the land, other land, or structure by erosion, falling debris, subsidence, slippage, or inundation from any source. This section does not include consequences from active faults, tsunami, or geothermal activity, and is inconsistent with the definition of a natural hazard.
Building Act 2004	Erosion (including coastal erosion, bank erosion, and sheet erosion); falling debris (including soil, rock, snow, and ice); subsidence; inundation (including flooding, overland flow, storm surge, tidal effects, and ponding); and slippage.	Definition does not include active faults, liquefaction, lateral spreading, or tsunami.
CDEM Act 2002	Something that may cause, or contribute substantially to the cause of, an emergency.	Includes all natural and anthropogenic hazards.

3. INTEGRATED ROLES AND RESPONSIBILITIES

The integration of the practice of hazard management can be improved by understanding how the various roles and responsibilities of central government agencies, regional councils, territorial authorities, and non-statutory planning tools can work together to provide a holistic approach. Figure 1 shows these relationships, and areas for improvement.

Figure 1 presents the five main statutes that govern natural hazards planning at different levels of government, namely central (orange), regional (green) and district/city (blue) levels. The hierarchy of plans established under each statute provides various regulatory and non-regulatory tools for natural hazards planning. The solid arrows show established relationships in the hierarchy of provisions. The dashed arrows highlight relationships between existing provisions where there is an opportunity for strengthening linkages. The relationships may be one- or two-way. These legislative provisions and the array of tools they provide constitute a robust 'toolkit' for natural hazards planning. However, many of these tools are not well known amongst either planners or emergency management officers, nor used to their full potential to reduce hazard risk and build community resilience (Glavovic, Saunders, &

Saunders, W.S.A, Beban, J.G, & M Kilvington, 2013. Risk-based approach to land use planning. GNS Science, www.gns.cri.nz/risk-based-planning

Becker, 2010; Saunders, Forsyth, Johnston, & Becker, 2007).

Saunders, W.S.A, Beban, J.G, & M Kilvington, 2013. Risk-based approach to land use planning. GNS Science, www.gns.cri.nz/risk-based-planning

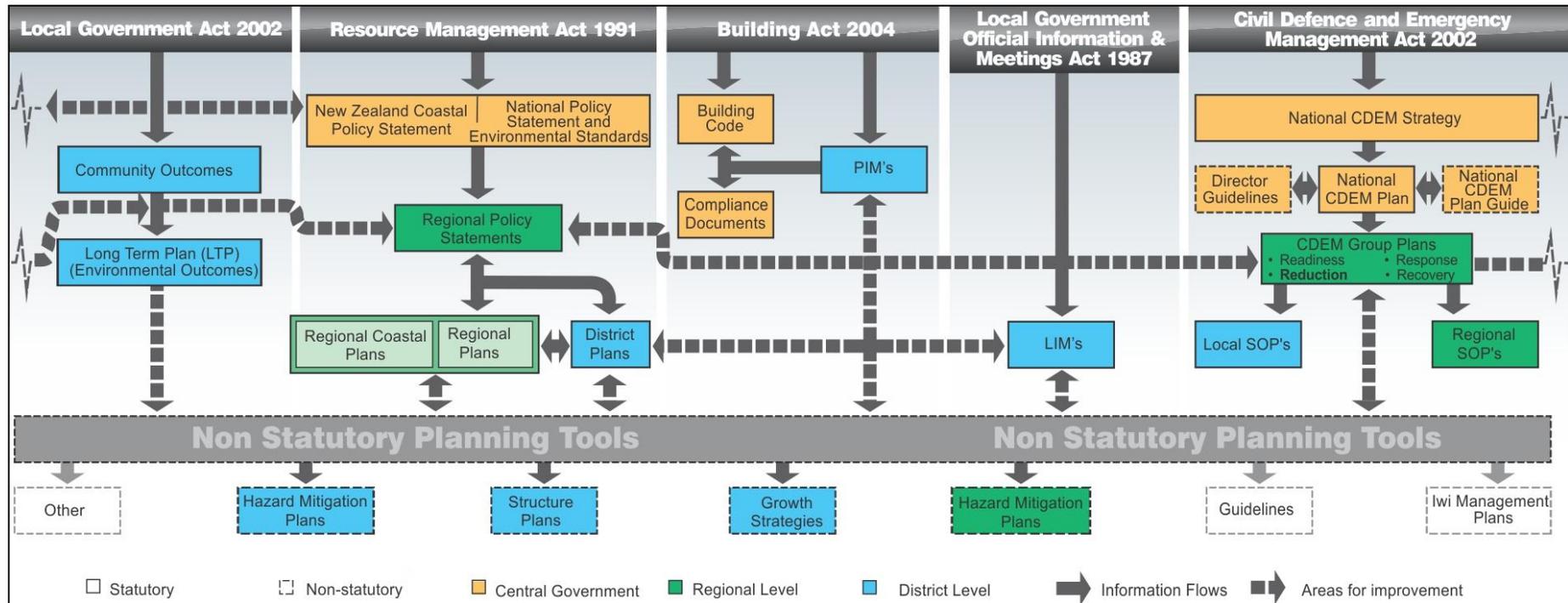


Figure 1 Legislative roles and responsibilities for hazard management in New Zealand (adapted from Saunders, et al., 2007).

Saunders, W.S.A, Beban, J.G, & M Kilvington, 2013. Risk-based approach to land use planning. GNS Science, www.gns.cri.nz/risk-based-planning

Under LGOIMA, territorial authorities must issue a LIM on request. The LIM provides information that a council holds on a parcel of land, including natural hazards. LIMs allow the applicant to become aware of any natural hazard on which a council holds information that may affect their property, and enables them to assess their willingness to accept or tolerate that risk. However, if hazard information is included in the district plan, it is not required to be included in the LIM. It is questionable whether applicants for LIMs are aware that the LIM may not include all information held by a council for a site, if that information is held in the district plan. Many LIM applicants assume that the LIM will contain *all* hazard information available.

Table 3 provides a summary of how these statutes contribute to the management of natural hazards in New Zealand. It can be seen from the table that primarily the reduction of risk lies with the RMA, whereas emergency management (readiness, response, recovery) lies with the CDEMA.

Table 3 Summary of ways in which statutes contribute to the management of natural hazards

Statute	Implication for natural hazard management
Resource Management Act 1991	<ul style="list-style-type: none"> • Health and safety issue must be addressed • Local authorities are required to avoid or mitigate the effects of natural hazards, not their occurrence (<i>Canterbury RC v Banks Peninsula DC, 1995</i>). • NZCPS includes specific coastal hazard policies. • S106 (consent authority may refuse to grant subdivision consent) does not allow for the consideration of all natural hazards as defined. • The ability to develop national policy statements and national environmental standards to address natural hazards (none currently exist).
Building Act 2004	<ul style="list-style-type: none"> • Requires all buildings to be 'safe from all reasonably foreseeable actions during the life of the building'. • Reference is made to the joint Australian/New Zealand loading standard AS/NZS1170 (Standards Australia/New Zealand, 2002), where the acceptable annual probability of exceedence for wind and earthquake loads are identified. These relate to the return period for an event (being 1/500, 1/1000 and 1/2500) and the building importance categories of II (Ordinary) III (Important) and IV (Critical). The more important the building, the longer the return period of an event is the structure required to be designed for. • These annual probabilities of exceedence correspond to a 10%, 5% and 2% probability within the nominal 50 year life of the building. • The ability to resist actions from other hazards is specified in the Building Code (a regulation that accompanies the Building Act) but no acceptable intensity of action or recurrence interval is prescribed either in the Code or in the Loading Standard (except for snow which has a nominal annual probability of exceedence of 1/150 years). • Sections 72 – 74 of the Building Act identify the process that Councils must follow when considering a building consent on a site subject to 1 or more natural hazards. The Building Act allows for Council to decline a building consent if, by granting the consent, the development would worsen or

Statute	Implication for natural hazard management
	<p>accelerate the effects from a natural hazard. Alternatively, building consent can be granted if:</p> <ul style="list-style-type: none"> i) adequate provision has been or will be made to protect the land, building work, or other property from the natural hazard or hazards; or ii) restore any damage to that land or other property as a result of the building work. <ul style="list-style-type: none"> • The definition of natural hazards under the Building Act is limited and does not include tsunami or fault rupture.
CDEM Act 2002	<ul style="list-style-type: none"> • 4R philosophy – risk reduction is assumed to be managed under the RMA (MCDEM, 2008a; Saunders, et al., 2007). • Encourage and enable communities to achieve acceptable levels of risk (which are not defined). • Readiness and response driven e.g. guidance for tsunami evacuation planning, mapping, and signage (MCDEM, 2008b, 2008c).
Local Government Act 2002	<ul style="list-style-type: none"> • Financial planning for risk reduction activities. • Take into account the foreseeable needs of future generations. • Section 11A – <i>“a local authority must have particular regard to the contribution that the following core services make to its communities: the avoidance or mitigation of natural hazards.”</i>
Local Government Official Information & Meetings Act 1987	<ul style="list-style-type: none"> • Provides for natural hazard information to be included in LIMs. • If the natural hazard is identified within the District Plan, this information is not required to be provided within a LIM (S44A(2)(a)(ii)).

As this section has shown, although there is good integration of purposes across statutes, there are still inconsistencies in how natural hazards are managed. While there is limited non-regulatory guidance available to planners on hazards, with the exception of the National Coastal Policy Statement (NZCPS; refer Section 2.4) there is no statutory guidance available (i.e. a specific national policy statement or national environment standard available for councils). The RMA allows for the development of these tools, but these are yet to be realised. While these statutes provide a framework for managing natural hazards, when an event does occur, new legislation may be enacted to assist the response and recovery (as seen with the recent Christchurch earthquakes). This has implications for the existing processes within the legislation, as outlined below.

4. CANTERBURY EARTHQUAKE RESPONSE AND RECOVERY ACT

On Saturday 4 September 2010 at 4.35am, a magnitude 7.1 earthquake was centred 9.7 km south east of Darfield, 37 km west of Christchurch. While located at a depth of 10.9 km with a maximum intensity of MM9, there were no deaths directly related to the earthquake, and only two people were seriously injured. The earthquake caused extensive ground liquefaction in some areas of Canterbury and ground shaking resulted in damage to many

commercial and residential buildings, which were unable to be reinstated.

The implication of the event from a legislative perspective was the enactment of the Canterbury Earthquake Response and Recovery Act 2010, which was passed under urgency on 14 September 2010. The legislation enabled the relaxation or suspension of statutory requirements, until 1 April 2012, that have the potential to divert resources away from the recovery efforts; may be unable to be complied with as a result of the earthquake; or could delay a prompt response to the emergency recovery. This exemption applied to all legislation that may be affected during the response and recovery, including the Building Act, CDEMA, RMA, LGA and LGOIMA. Many orders refer to removing liability for certain actions, extension of legislative timeframes, and the amount of information provided in LIMs (refer to Wynn Williams & Co, 2011 for further details of orders). The legislation also created the Earthquake Recovery Commission to provide advice and guidance, but the commission holds no liability for decisions being made.

On 22 February 2011 a shallow, magnitude 6.3 aftershock occurred under the Port Hills of Christchurch. This caused devastating damage to the CBD and the greater Christchurch area, with 185 confirmed deaths and hundreds of injuries. The event resulted in the first national declaration of an emergency in New Zealand. This earthquake resulted in further changes via Orders in Council under the Canterbury Earthquake Response and Recovery Act 2010, and the legislative establishment of the Canterbury Earthquake Response Agency (CERA) in April 2011. Changes under Orders in Council included the streamlining and fast tracking of resource consents for land remediation works. It was considered that the normal process of public notification, hearings and appeals would delay the rebuilding of suburbs, potentially for years. Under this Order, affected parties have two weeks to provide written submissions prior to councils making a decision (NZPI, 2011). It is too soon to understand or assess the process that CERA will implement. However, these new statutes show how the management of natural hazards is often reactive, in that the legislative environment can change in response to an event. Consideration of improving risk reduction via land-use planning provides a proactive, rather than reactive, response to natural hazards and ensures the sustainability of communities is not compromised.

5. NEW ZEALAND COASTAL POLICY STATEMENT

The 2010 NZCPS (Department of Conservation, 2010) is the only national regulatory policy document that provides guidance on the management of coastal hazards. Regional policy statements, regional plans and district plans must give effect to the NZCPS. The NZCPS specifically includes natural hazards in Policies 24 (Identification of coastal hazards) and 25 (Subdivision, use and development in areas of coastal hazard risk). In particular, Policy 25 states:

- ... in areas potentially affected by coastal hazard over at least the next 100 years:
 - (a) avoid increasing the risk of social, environmental and economic harm from coastal hazards;
 - (b) avoid redevelopment, or change in land use, that would increase the risk of adverse effects from coastal hazards;...
 - (f) consider the potential effects of tsunamis and how to avoid or mitigate them.

Policy 24 refers to “areas at high risk”, but this risk level is not defined, i.e. factors that determine high or low risk are not provided.

6. RISK REDUCTION AND THE CDEMA

Saunders et al. (2007) provide details on how risk reduction requirements under the CDEMA are assumed to be managed under the RMA Act, via regional policy statements and district plans (refer Appendix 1). In summary, it is essential that consistent policies between CDEM group plans and RMA plans are provided, to ensure that risk reduction is effective in achieving common risk reduction objectives and outcomes, particularly around land use recovery (Becker, Saunders, Hopkins, Wright, & Kerr, 2008).

The term risk reduction is not included in the RMA, only the requirement to avoid or mitigate natural hazards (see next section). This requires emergency management officers and land use planners to work together with their communities to ascertain levels of risk (as required under the National CDEM Strategy (MCDEM, 2008a)), which are otherwise not defined. RMA decision makers and planners are therefore primarily responsible for risk reduction (Saunders, et al., 2007) and land use decisions – although there is often resistance to managing natural hazards due to costs of undertaking risk assessments and the potential for litigation. In order to achieve sustainable risk reduction, it is imperative that these two professions work together (for further information refer to webpage http://www.em.gov.au/Documents/AJEM_Feb07_StrengtheningLinkages.pdf). Under the RMA, the primary focus is on avoiding, remedying or mitigating the effects of natural hazards. This is the focus of the following section.

7. RECONCILING AVOIDANCE, MITIGATION, AND RISK REDUCTION UNDER THE RMA

Within the RMA, the definition of sustainable management includes avoiding, remedying, or mitigating any adverse effects of activities on the environment, with no preference given for any option, or any reference to risk. Contrary to international definitions of mitigation that include avoidance (Burby, 1998; Godschalk, 2002; Mileti, 1999), in New Zealand the term mitigation is typically used to include measures other than avoidance, as that is a separate option. In the CDEMA, neither risk reduction nor mitigation is defined. In the National CDEM Strategy, risk reduction is a combination of avoidance and mitigation (MCDEM, 2008a).

The terms ‘avoid, remedy and mitigate’ are not defined within Section 2 of the RMA and there is limited case law to provide guidance on how these concepts can be applied to natural hazards. In practice, greater emphasis is given to avoiding and mitigating the risks associated with hazards than remedying the effects. This is reinforced in Sections 30 and 31 (functions of regional councils and territorial authorities) where regional councils and territorial authorities are only required to avoid and mitigate natural hazards when controlling the use of the land and the effects of an activity. The common meaning of ‘remedy’ is “a means of counteracting or eliminating something undesirable” (<http://oxforddictionaries.com/definition/english/remedy>). In the case of most natural hazards (e.g. landslides, tsunami, flood, earthquake), the hazard cannot necessarily be eliminated and therefore remedying it becomes impractical. Rather, avoidance or mitigation measures can lessen the risk to people and property and are therefore given greater emphasis (Burby, 1998; Ericksen, 1986; Mileti, 1999; Saunders & Glassey, 2007).

However, there are subtle differences in outcomes between avoidance and mitigation under

the RMA, and risk reduction under the CDEMA. Mitigation can be defined as an element of risk reduction, involving an action taken to reduce or eliminate long-term risk to people and property from hazards and their effects (excluding avoidance)¹ (Godschalk, 2002). Under the National CDEM Strategy, risk reduction is defined as:

Identifying and analysing long-term risks to human life and property from hazards; taking steps to eliminate these risks if practicable, and, if not, reducing the magnitude of their impact and the likelihood of their occurring” (MCDEM, 2008a, p5).

It is assumed that this definition includes avoidance via ‘taking steps to eliminate these risks’ – of which avoidance is an option. While avoidance is an option separate from mitigation in the RMA, risk reduction under the CDEMA includes both mitigation and avoidance. Levels of risk are often cited when mitigation and risk reduction are discussed (e.g. NZCPS Policy 25(a); CDEMA s3(b)). However, there is little guidance available on what an acceptable level of risk is, to whom, and to what. This has implications for planning policy, when acceptable levels of risk are included in policy, but not defined.

In the New Zealand context, avoidance achieves risk reduction by not putting people and property in harm’s way. In contrast, mitigation provides measures that incorporate the risk, but may still leave people and property at risk (i.e. residual risks, which may require structural protective works), and therefore may not achieve risk reduction. Two Environment Court examples highlight the implications of this discrepancy: Kaihikatea Estate in the Coromandel, and the Holt case in Dunedin – both of which focus on acceptable levels of risk and mitigation measures. Kaihikatea Estate provides an example of the implications of mitigation, in that it does not require mitigation to be effective, only applied. This example is provided in Appendix 1.

¹ Note that this definition of mitigation is based within the US context, which includes avoidance. However, for the purposes of this research, and as no definition of mitigation is provided under the RMA, it can be applied to New Zealand acknowledging that avoidance is a separate option.

APPENDIX 1 KAIHIKATEA ESTATE DEVELOPMENT

An example of how mitigation can be interpreted and implemented is the Kahikatea Estate subdivision application in the Thames-Coromandel District. The application provides one example where mitigation measures have been put in place, but risk to property (and personal safety, depending on the effectiveness of emergency management plans) is increased. This example also highlights how risk governance is dependent on institutional arrangements – in this case, the legal framework of the RMA.

Located on the Tairua River floodplain, the site is tidally influenced and had been flooded from the river five times during the previous 12 years. As such, the site is expected to flood on average every two to five years (Tonkin & Taylor, 2005). The site is deemed a high hazard site by the regional council, as the depth of flow in the main floodway is greater than one metre and/or speed of flow is greater than one metre per second. Rather than avoiding the risk altogether, this hazard was addressed by the applicants with mitigation options, their philosophy being to “recognise the risk of flooding that exists and to take measures to overcome the hazard risks, without endeavouring to impede the natural flow patterns of floodwater through the site” (Bhana, 2005, p7).

Original mitigation options proposed by the applicants included (Bhana, 2005, p7-8):

- A pontoon jet-drive rescue craft being permanently maintained on site. Carrying up to nine people, the craft would be used to evacuate people from their homes from designated loading and unloading areas. Several people in the area would be trained to operate the rescue craft on a first-response basis.
- Automated early warning systems to monitor river and rainfall levels, to provide adequate warning to evacuate if required. This system is also linked to the first response [emergency management] network.
 - Safe areas will be provided above the flood levels where cars could be stationed in the event of rising water levels, with all-weather access to the main road. Alarms would give ample time for vehicles to be taken to the designated area. Community facilities would be above any flood levels, and would provide shelter for the residents if required as well as a command post for a first-response team.

Also identified in the consultant report (Tonkin & Taylor, 2005, p18) was that:

Potential damage to buildings and building platforms will be mitigated by setting minimum floor levels to EW [Environment Waikato²] standards and constructing platform batters and building foundations to withstand flood velocities. In a similar way, the potential for loss of life and/or injury may be mitigated by proper planning and procedures.

The upstream corners of the building platforms were also to be reinforced (Arcus, 2006). It was summarised in the consultant report (Tonkin & Taylor, 2005, p20) that: “The risk of developing within the floodplain is accepted by the developer ...”. This raises issues of who is accepting the risks – the developer in the short term, but future purchasers in the long term. The Regional Council stated in their planner’s report that:

² EW changed its name in April 2011 to Waikato Regional Council (WRC).

...the current location of the building platforms or sites for residential development proximity to the Tairua River based a [sic] precautionary approach to represent too great a risk to be suitable for residential development (cited in TCDC, 2006, p23).

The application was publicly notified, and subsequently an independent commissioner was appointed. In June 2006 the Commissioner approved the application, subject to conditions of consent being imposed (including the provision of a rescue boat). In his conclusion, the Commissioner stated that "Material damage to structures is unlikely because the structures are above a very conservative minimum floor level" and "Occupants are unlikely to be at risk because of the warning system. In the unlikely event that it fails there are other factors which would alert occupants to flood" (Arcus, 2006, p31).

In May 2008 the Environment Court issued a consent notice which included the following conditions (Judge Dwyer, 2008, p3-4):

3. The consent holder shall provide a detailed Emergency / Hazard Management Plan 'E/HMP', detailing the provisions to be made to ensure the safety of occupants of the subdivided lots in the event of inundation of the site. This shall be submitted for the approval of the Thames-Coromandel District Council's Monitoring Officer. The E/HMP shall include but not be limited to the following measures:
 - a) Ensuring the installation and ongoing maintenance of a new river level recorder.
 - b) Ensuring an existing river gauge (Broken Hill) is upgraded to provide secure and ongoing river level data.
 - c) The installation and ongoing maintenance of a 24 hour a day river level monitoring system shall be connected to all residential buildings and the Regional Council.
 - d) Ensuring the provision of an evacuation plan. This is to be developed and maintained by the Residents Association of Kahikatea Estate, and will be developed around different responses corresponding to onsite water levels.
 - e) Ensuring members of the residents association receive as minimum annual training in compliance with the provisions of the E/HMP.
 - f) Ensuring the culverts under the internal driveway are regularly maintained including at least annually the
 - I. Clearance of any accumulated debris, and
 - II. Rectifying any visible signs of erosion.
 - g) Ensuring any maintenance to the internal private way results in the RL of the private way being retained at the Hauraki Catchment BD Datum level of 14.5 metres with variance of 0.02 metres.
 - h) Ensuring the ongoing maintenance of the building platforms for flood defence purposes for each of the residential lots.
 - i) Ensuring the area defined as 'Restricted Planting Area' is managed so its primary purpose as a floodway is not compromised.
4. The consent holder shall provide to the Thames-Coromandel District Council a copy of the documentation establishing the Residents Association and setting out to the satisfaction of the

Council's Monitoring Officer the responsibilities of the Association in terms of on-going site management. This includes arrangements to ensure compliance of the E/HMP; and providing Council with an annual report demonstrating on-going compliance. This is to be prepared by an independent certifier appointed by the Association and acceptable to the Council's Monitoring Officer.

The original jet boat response measure was not included in the final decision. This case provides an example of the wider implications for risk reduction, including the importance of qualifying and/or quantifying the levels of risk for natural hazards to ascertain and clarify what is acceptable, tolerable and intolerable; who accepts the short- and long-term risks i.e. the developer versus a future purchaser; and the paradoxical relationship between mitigation and risk reduction (i.e. mitigation does not necessarily result in a reduction of risk). In this case, risks to property are still potentially problematic for those dwelling in these properties. While the developer was willing to accept the risk, future owners/generations will have a legacy of flood risk to live with if they choose to (see also Handmer (2008)). The mitigation measures proposed lead to an increase in risk from the original land use, otherwise the consent conditions would not be required. To date, the development has not yet begun due to the 2009-10 economic recession.

The decision highlighted the inadequacy of the existing district plan provisions for managing flood risks. As a result of this decision, the Thames-Coromandel District Council undertook a plan change to the flooding section of the district plan's natural hazard chapter, which is yet to become operative. Ironically, the website for the development states that:

Sites will have a high standard of amenities including a gravelled driveway to improve water dispersal ... The development exceeds local body resource consent standards, preventing any possible risk of flooding to platforms or homes: so your house is safe as ... well, houses (Kahikatea Estate).

This statement provides an example of the developer bearing the risk while properties are sold. Local body resource consent standards are exceeded due to the risk of flooding; it is still possible that platforms and homes can be flooded (hence the requirement for a warning system and evacuation plan).

When assessing mitigation measures, timeframes (i.e. likelihood, recurrence intervals, return periods, probabilities etc.) should be considered to assess whether mitigation measures are adequate for the risks and consequences involved.

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