

## 8 ISSUES, OBJECTIVES: Natural Hazards

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### 8.1 OVERVIEW OF NATURAL HAZARDS

One of Council's specific functions, under section 31 of the Act, is:

*"(b) The control of any actual or potential effects of the use, development, or protection of land, including for the purpose of the avoidance or mitigation of natural hazards"*

Natural hazards are defined in the Act as:

*"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"*

The more significant of these for the Horowhenua are:

#### 8.1.1 Surface Water Flooding

Periodic surface water flooding has been a feature of the floodplains of all of the District's major rivers and streams.

Flooding of the Manawatu River has been an historical problem for the low-lying land in the vicinity of the lower reaches of the river. The former Manawatu Catchment Board has developed the "Lower Manawatu Flood Protection Scheme", incorporating stopbanks, floodways, and flood warning systems, to assist landowners in that vicinity to manage the flood hazard.

The Koputaroa, Moutoa and Makerua areas are former swamps and are subject to drainage by drainage schemes. The drainage schemes have enabled the land to be farmed and upgrades to some of the schemes have occurred to meet the increasing demands of more intensive farming systems. Land in these areas is subject to flooding, particularly if the pump systems fail. The Makerua Drainage scheme has recently been reviewed by the Manawatu-Wanganui Regional Council with several options available for improvements or the upgrading of the system to meet the increase in drainage requirements resulting from more intensive farming practices.

Similarly, flooding of the Managua stream (west drain) which is part of the Ohau-Manakau Scheme, the Ohau River, Waikawa River, and Waiwiri Stream has been an historical problem for landowners in the lower reaches of those catchments. Local flood protection and drainage schemes were developed by the former Manawatu Catchment Board for the Ohau River, the Waikawa and Manakau Streams and the Waiwiri Stream. In 1976 these schemes were combined to form the "Ohau-Manakau Scheme". The combined flood protection scheme comprises stopbanks, streambed and riverbank protection and maintenance works along defined sections of the Ohau River and the Waiwiri, Kuku, Waikawa, and Manakau Streams. The Manawatu-Wanganui Regional Council is currently reviewing the scheme and the nature of the flood hazard in these catchments. Historical records associated with the catchments and the flood protection scheme provide an indication of flood risk in these areas. The level and extent of flood risk may be adjusted as a result of the Scheme review. This may require an upgrade of the flood protection scheme or other options such as landuse and building controls may be necessary. A Flood Hazard Analysis has recently been completed by the Manawatu-Wanganui Regional Council for the Horowhenua District and a Variation or Plan change will be made in the near future.

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### **8.1.2 Coastal Erosion and Inundation**

Wind and water erosion and inundation of low-lying areas due to possible rise in sea level, are constant threats for the entire coastal plain and is a significant natural hazard in the District. The hazard is particularly acute for the built development at each of the coastal settlements

Foredune protection designations or reserves and dune stabilisation and protective planted areas exist in most of the settlements. Any future urban development in those settlements will need to be located and constructed so as to avoid worsening the hazard and to protect property from extreme inundation events. Accretion and sand creep are also features of some parts of the coastline e.g. Waitarere Beach. River mouth migration is an important natural factor in the long-term erosion-vs-accretion pattern of the coastline.

Certain uses of the dunes can exacerbate wind erosion of the sand - especially those activities which result in removal of vegetation (e.g. motor vehicles which disturb the sand and vegetation cover, exposing it to the wind). Coastal erosion is a potential hazard for sand dunes immediately adjacent to the coastline and for more inland sand country. Wind and water action, together with some inappropriate grazing and removal of surface vegetation cover, can cause erosion of the fragile sand country.

Hazards can result from sand drifts or the undermining of land or structures which are caused by such erosion. Large areas of the sand plain are planted in plantation pine forest. One of the objectives of the original planting was to stabilise the potentially fragile sand. Those plantations are progressively being harvested and re-planted.

Tsunami events and sea level rise are also considerations. In the event of a significant tsunami, all parts of the coastal margin could be at risk of inundation or damage. It is not possible, at this time, to anticipate the precise level of risk or the extent of potential environmental damage expected to result.

Sea level rise is predicted by international scientists. Possible implications include heightened flood risk and erosion. There are, however, no precise estimates of probability, timing, or on-the-ground impacts although further national and international monitoring and research is being undertaken.

### **8.1.3 Land Instability**

Land instability, generally resulting from soil erosion, occurs as a localised hazard throughout the District. The natural ground conditions of some parts of the District may combine to mean that the land is subject to possible subsidence e.g. the area identified along Kawiu Road which was recognised in the former Transitional District Plan as being subject to possible subsidence.

### **8.1.4 Fire**

Fire is an ever-present hazard throughout the District e.g. in the peat-lands of the Opiki area. Fire is a naturally-occurring phenomenon and is also a necessary component of or consequence of some land use activities. For example, fire is a necessary part of certain crop farming techniques. The incidence of fire and the severity of fire damage can be influenced by land use practices and safety and mitigation measures incorporated into activities. In urban situations, building standards and community fire fighting services are established to manage fire hazard. Council is a Rural Fire Authority and assists in co-ordinating the emergency response to manage rural fire events.

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### **8.1.5 Seismic Activity**

The District and the wider region are affected by seismic activity. The Manawatu-Wanganui Regional Council has commenced a six-step earthquake hazard analysis project to better understand and plan for seismic hazard in the region. The first (scoping) stage of that project has generated a report and map at 1:250,000 which summarises current information on the location of active faults and folds. The report also highlights possible forms of earth deformation which might result from seismic events.

The Stage 1 report identifies a series of faults and anticlines affecting the Horowhenua District. The report states that the faults and folds identified in the map are located to within 200 metres.

A second volume has been produced titled 'Hazard Analysis Manual, Volume II - Seismic Analysis'. This publication provides a comprehensive analysis of possible sources of seismic activity and its consequences. The further stages of the analysis project are expected to better quantify hazard risk and generate policy recommendations for managing and planning for the hazard.

Seismic hazard poses implications for standards of building construction, for the location and construction of essential services infrastructure, and for emergency response planning. Seismic events themselves cannot be avoided or mitigated. Effective environmental standards, structural design, and emergency response planning will, though, be important to successful post-event management and minimising damage for communities and the environment.

### **8.1.6 Volcanic Activity**

The relatively small geographic size of New Zealand means that the entire country is potentially at risk from the effects of volcanic events occurring anywhere in the country. Events such as ash fall are a possibility anywhere in the country. It is not reasonable to provide precise estimates of the probability of such events or of their likely extent or consequences. All parts of the environment, including settlements and land use activities, are at risk. The events themselves cannot be avoided or mitigated. Effective emergency response planning will, though, be important to successful post-event management and minimising damage for communities and the environment.

### **8.1.7 Roles and Responsibilities**

Management of natural hazards under the Act involves the combined efforts of a number of agencies including District and Regional Councils. The Manawatu-Wanganui Regional Council has, through the Regional Policy Statement, retained the responsibility for setting objectives, policies and rules relating to activities in the bed of lakes and rivers and for land adjacent to rivers zoned for river control. The Regional Council has also retained responsibility for setting objectives, policies and rules relating to subsidence resulting from soil disturbance and vegetation clearance.

The Manawatu-Wanganui Regional Council has a number of hazard management initiatives including:

- Investigation of seismic, volcanic, subsidence, tsunami, and flood hazards;
- Raising public awareness of hazards;
- Policies to minimise hazard risks for human life, property and the environment; and
- Emergency response planning (civil defence).

The District Council is responsible for developing objectives, policies and rules relating to control of use of land in their district for the purpose of avoiding, remedying or mitigating any adverse effects of

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flood hazards, land subsidence from activities other than soil disturbance and vegetation clearance and seismic, volcanic and tsunami hazards.

The proposals outlined in this Plan envisage co-ordination of hazard management between the District and Regional Council.

### 8.2 SIGNIFICANT RESOURCE MANAGEMENT ISSUES FOR NATURAL HAZARDS

**Issue 17:** The potentially adverse effects of natural hazards on the environment including loss of life and property damage.

**Issue 18:** The potential worsening of the risks or severity of natural hazards that can result from inappropriate use and development of land.

**Issue 19:** The importance of co-ordinated emergency response planning.

**Issue 17:** The potentially adverse effects of natural hazards on the environment including loss of life and property damage.

Some, but not all, of the natural hazard events likely to affect the District can be managed to avoid adverse environmental effects. Where subdivision, use, or development is intended or expected to occur, it is important that every endeavour is made to, firstly, avoid locations which have extreme risk of the hazard. In some situations it may not be possible to consider alternative locations (say, for the changed use existing buildings) and for some hazards the risk may be fairly low or equal throughout the District. In these situations, every endeavour should be made to remedy or mitigate any adverse effects expected to result from the hazard.

**OBJECTIVE 12:** Avoidance and, where necessary, mitigation of the adverse effects of natural hazards on human life, property, and the natural environment.

**POLICY 12.1:** To avoid, remedy or mitigate any adverse environmental effects caused by erosion, subsidence, slippage, debris flow, or surface water flooding where land is proposed to be subdivided and used or intended to be used for human occupation.

**POLICY 12.2:** To avoid, remedy or mitigate any adverse environmental effects caused by erosion, subsidence, slippage, debris flow, or surface water flooding for all new structures intended to be used for human occupation.

**POLICY 12.3:** Ensure that all structures and activities are located and constructed so as to minimise material damage from seismic events.

**POLICY 12.4:** Ensure that all structures and activities incorporate measures to minimise risk of and damage caused by fire.

**POLICY 12.5:** Improve, over time, Council's data base describing the natural hazards facing the District.

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<b>POLICY 12.6:</b>	<b>Discourage the development of buildings and other significant assets on areas which may be prone to coastal erosion or the effect of sea level rise unless the structures:</b> <ul style="list-style-type: none"><li>• have a significant community benefit and need to be located in the coastal environment;</li><li>• do not adversely affect the natural character of the coastal environment;</li><li>• are relocatable;</li></ul>
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### ***Explanation and Principal Reasons***

*The policies target the natural hazards and the particular stages of land subdivision and development that are particularly critical in managing the effects of natural hazards.*

### **METHODS FOR ISSUE 17 AND OBJECTIVE 12**

#### **Building Controls**

- Council will enforce the standards of the Building Act. In particular, buildings intended for human activity will be required to be located and constructed to achieve protection from flood events of up to 1 in 50-year return period probability. The standards specified in the Act for seismic design and fire protection will be imposed.

#### **District Plan**

- In considering subdivision applications for land subject to natural hazards, the District Council must have regard to S106 'Subdivision consent not to be granted in certain circumstances' of the Resource Management Act 1991. However the consent may be granted where the District Council is satisfied that in granting the subdivision consent the natural hazards specified in S106(a) will be avoided, remedied, or mitigated by one or more of the following:
  - (a) Rules in the District Plan:
  - (b) Conditions of a resource consent, either generally or pursuant to section 220(1)(d):
  - (c) Other matters including works.
- Land use activities that require resource consents will be assessed in terms of their susceptibility to natural hazards (and particularly flooding, instability, erosion, fire, and seismic activity). Conditions will be imposed where appropriate.
- Soil conservation, erosion protection, river control and flood protection works undertaken by the Regional Council and other agencies with a responsibility in these matters will be allowed for in this Plan as a permitted activity.
- Necessary flood protection works will be protected by designations in the Plan.
- The coastal buffer area, which is identified on the planning maps, is located adjacent to the coast and is designed to protect the sensitive coastal foredunes and other coastal landscapes from erosion and destruction. Rules require that all buildings, structures and the subdivision of land in this area will require a resource consent for a discretionary activity.

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### Monitoring

- Council will avail itself of information describing hazards affecting Horowhenua District as these come to hand from other agencies (and particularly from the Regional Council).
- Council will cooperate with the monitoring and investigation studies undertaken by other agencies including the Regional Council.

### Provision of Information

- Council will include in the District Plan, for the information of the community, information describing known flood and land instability hazards.
- Council will also make available to the public, through Project Information Memoranda (PIMs), Land Information Memoranda (LIMs) and individual enquiries, information about natural hazards held by Council.

### Hazard Protection Programmes

- Council will continue to support the maintenance of flood protection schemes.
- Council will maintain buffers of open space between coastal developments and the foredunes.
- Council will consider requiring or acquiring buffers of open space between developments and other natural hazard areas.
- Council will continue to act as the District's Rural Fire Authority.

*Council does not have the resources in-house to undertake all research and monitoring itself but will make use of current resources available elsewhere to supplement its own monitoring initiatives. Public awareness of hazard is considered to be important to hazard management. The District Plan is a suitable public document in which to state known hazards. These initiatives are considered to be essential to actively manage hazard risk.*

<b>Issue 18:</b>	<b>The potential worsening of the risks or severity of natural hazards that can result from inappropriate use and development of land.</b>
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Some activities have the potential to worsen the risk or consequences of hazards. Examples include the location of structures within floodplains which could impede the flow of flood waters and worsen flood risk for upstream properties. Another example is earthworks or construction which could worsen the potential for land slippage or erosion. Council will direct its attention to the effects of activities on the known hazards.

<b>OBJECTIVE 13:</b>	<b>Land use and development that does not significantly worsen the risk of occurrence or the severity of natural hazards.</b>
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<b>POLICY 13.1:</b>	<b>Ensure that the use and development of land does not accelerate or worsen any material damage to that land, or any other land or structure resulting from erosion, subsidence, slippage, debris flow, or surface water flooding.</b>
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<b>POLICY 13.2:</b>	<b>To promote public awareness and understanding of the actual and potential threat posed by natural hazards and how the community can help avoid, remedy and mitigate adverse effects.</b>
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### **Explanation and Principal Reasons**

*This is seen as an essential policy approach in view of the clear requirements of section 106 of the Act.*

*The control of any actual or potential effects of the use, development or protection of land, including for the purposes of avoiding, remedying or mitigating natural hazards, is a function required of the District Council under the Resource Management Act. An essential part of this function is an informed and prepared community. While the District Plan will attempt to mitigate the effects of natural hazards, the emphasis is to encourage people to avoid situations in which their life or property could be in danger.*

*The identification and assessment of risk of natural hazards in the District will raise public awareness over time, provide an information base to gauge the implications for subdivision and/or development proposals, and aid the application of mitigation measures. While it will be important to ensure mitigation measures are in place in the event of an emergency, the emphasis in the management of natural hazards is to encourage people to avoid situations in which they or their property could be in danger.*

*Human activity can exacerbate natural occurrences, such as flooding, but by developing hazard prone areas such as flood plains, we increase the potential for damage, should an event occur. Reducing vegetation cover can induce erosion, caused by climatic events but control techniques such as tree planting, management of riverbanks can be used to mitigate hazards. The risk of a natural hazard event is always present but the effects of that event can be increased by human activity, causing threat to human life and the economic costs they impose on individual and community.*

### **METHODS FOR ISSUE 18 AND OBJECTIVE 13**

#### **Building Controls**

- The Building Act will be used to prevent buildings which would worsen hazards.

#### **District Plan**

- Rules will require specific assessment of the likely hazard implications of some structures and activities in areas of known hazard (e.g. the land subject to instability in Kawiu Road)
- Rules will prevent the construction of structures within essential flood channels which would impede flood flows.

*Section 36 of the Building Act 1991 allows for monitoring and the management of risk posed by buildings. Additional plan controls are expected to be necessary in known, high-risk, areas.*

#### **Education**

- Education through the resource consent process, promotions, pamphlets and through Civil Defence initiative.

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**Issue 19: The importance of coordinated emergency response planning.**

Emergency response planning (civil defence) is often, wrongly, viewed as the "ambulance at the bottom of the cliff". It is essential that emergency response planning is closely co-ordinated with land management and the location of critical community activities and services.

**OBJECTIVE 14: Effective emergency response to natural hazard events.**

**POLICY 14.1: Contribute to a coordinated and effective emergency response resource for the District.**

**POLICY 14.2: Ensure that all use and development of land is located and constructed in a way that is not inconsistent with Council's emergency response strategy.**

### ***Explanation and Principal Reasons***

*The policies highlight the importance of integrating the management of land use with the practical needs of Civil Defence. Council also acknowledges the need to maintain an active civil defence response capability for emergency events.*

### **METHODS FOR ISSUE 19 AND OBJECTIVE 14**

#### **District Plan**

- Council will constantly monitor the compatibility of District Plan policies, rules, and zones with emergency response planning needs.
- In considering resource consent applications, Council will assess implications for environment, people and communities.

#### **Civil Defence**

- Council will continue to participate, with adjoining District and Regional Councils in co-operative Civil Defence planning and exercises.

*Integrated resource management and emergency management is important to the sustainable management of the environment.*

### **8.3 ANTICIPATED ENVIRONMENTAL RESULTS**

The outcome for natural hazards which are anticipated to result from the combined implementation of the above policies and methods is as follows:

- Limited damage to life or property resulting from natural hazards in the District.