SECTION 18 - NATURAL HAZARDS

Introduction

Many areas within the Mackenzie District are vulnerable to the impacts of natural hazards which can result in substantial damage to private and community assets, injury or loss of life, and damage to the natural environment. The following list identifies the known and anticipated natural hazards in the Mackenzie District. This list is not an exhaustive list.

a) Flood Hazard (flooding, erosion, deposition and avulsion)

- Tekapo River
- Pukaki River
- Twizel River
- Opihi River
- Opuha River
- Fairlie Township Creek, Halls Creek
- Tengawai River and major tributaries
- Hooker Flats
- Lakes Pukaki, Tekapo, Alexandrina, Opuha (proposed)
- Areas of potential risk from canal failure.

b) Shallow Slumps and Earth Flows

- Kimbell/Fairlie area.

c) Slumping or Slipping (precipitated by seismic activity and/or undercutting by wave/water action, and/or excess ground /surface water)

- Lake edges
- Some active alluvial fans.
- Landfill sites

d) Active alluvial fans (characterised by episodic aggradation/degradation cycles) - may experience flooding, deposition, erosion, debris flows, avulsion

- Kitchener
- Glencoe
- Black Birch
- Sawyer (Unwin)
- Hoop Horn
- Birchhill Stream
- Freds Stream
- Bush Stream
- Twin Stream
- Whale Stream
- Jacks Stream
- Jollie Stream
- Landslip Creek.

e) Rockfall areas

- Foliage Hill
- Sebastopol.

f) Earthquake

- Ostler Fault

g) Drought

h) Fire

i) Wind

ISSUES

Issue 1 - Adverse Effects of Natural Hazards

Description

The Council is required under the Resource Management Act to control any actual or potential effects of the use of land where this could avoid or mitigate the impacts of natural hazards. The Regional Policy Statement also requires district council's to deal with natural hazards in a comprehensive way.

Flooding is a natural hazard that can most effectively be avoided or mitigated by providing "protection" (e.g. stopbanks) or by guiding communities away from areas exposed to flooding. In the case of Fairlie the cost of effective protection is unlikely to be able to be borne by the community. A number of other methods can be used to mitigate this natural hazard throughout the District, such as siting new development on higher ground or raising site or floor levels. In addition, the roading system can be utilised to convey floodwaters. Civil defence preparedness should be maintained, including an early warning and evacuation system. Awareness of flood-fighting techniques such as sand-bagging and storing valuable possessions above flood level can also be promoted. The community is also unlikely to support restrictions that prevent residential growth in Fairlie. However, the significance of the flooding risk to Fairlie and its surrounding area from the Opihi River and the western catchment needs to be recognised and suitable measures taken to avoid loss of life and damage to property.

At Aoraki/Mount Cook Village flooding and debris flows from the Black Birch Fan, Glencoe and Kitchener Streams present risks to both permanent and travellers accommodation and facilities. Geotechnical research has quantified the risks and identified the mitigation works required.

The effects of drought, may be avoided (by excluding things that may suffer adverse effects from within the drought prone area), or they may be alleviated in various ways including, where possible, supplementing water supplies. Drought management often relies on the common sense of individuals, as does the avoidance of forest or scrub fires. Long term changes in land use practices can actually increase or decrease vulnerability to drought or fire. Similarly, changes in land use in the high country may either increase or decrease the vulnerability of the area to damage from snow, depending on the land use. For example, one

species of livestock may be more adaptable to snow conditions than another species.

Earthquakes can pose risks for the safety of people and communities, and their property. There are a number of active faults in the District. The Ostler Fault is a significant fault system that crosses through the Mackenzie Basin, close to the town of Twizel. Mapping of the fault hazard area allows for potentially significant effects to be mitigated by ensuring development within that area takes account of known risk, and raising the awareness of people and communities.

Objectives And Policies

Objective 1

Avoid loss of life, and minimise the cost of damage and disruption to the community, or other parts of the environment from natural hazards.

Policies

1 To increase community awareness of the potential risk of natural hazards, through the regular provision of advice and information.

2 To continually develop and refine a hazards register, in conjunction with the Canterbury Regional Council, as a basis for Council decisions regarding subdivision and building development.

3 In conjunction with the Canterbury Regional Council and the Department of Conservation, to monitor the degree to which the long term trends in land use practices and patterns may increase the vulnerability of communities to natural hazards, in order to assess the need for additional protection measures through the District Plan.

4 To mitigate the effects of natural hazards by ensuring, in conjunction with the Canterbury Regional Council, that emergency response procedures are in place.

5 To ensure that buildings are constructed appropriately to mitigate the risks associated with flooding, instability, earthquake and fire hazards.

6 Within any resource consent process, to ensure that any proposed developments have an adequate assessment completed to identify any natural hazards and the methods used to avoid or mitigate a hazard risk.

7 To minimise the likelihood of damage to future assets, by discouraging further subdivision within areas subject to high flood risk, except where subdivisions are unlikely to lead to the establishment of further assets in such areas, or where floors can be raised to mitigate the effects of flooding.

8 To differentiate between areas of High Flood Risk and Low Flood Risk and impose controls accordingly.

9 To require a higher level of flood mitigation for residential buildings than commercial, industrial or agricultural buildings.

10 To minimise the risk of earthquakes affecting people and property as far as practicable, by controlling subdivision and development in the Ostler Fault Hazard Area.

Implementation Methods

a Advise and inform the community of potential natural hazards and how to be prepared for civil defence emergencies.

b Information collected during the resource or building consent process, and any other information obtained through research and in conjunction with the Regional Council, to be included on the Council's hazard register.

c Ensure that liaison with the Canterbury Regional Council continues to ensure that a co-ordinated monitoring approach can measure the degree to which the long term trends in land use practices and patterns may increase the vulnerability to natural hazards such as flooding, coastal erosion, drought, fire and earthquakes.

d In conjunction with the Canterbury Regional Council, ensure that emergency response procedures are in place to mitigate the effects of a natural hazard.

e Ensure Council staff take adequate consideration of appropriate earthquake and fire hazard standards and flooding and instability hazards, during the building and subdivision consent processes.

f The provision of rules to control subdivision and development in areas identified as being at risk of flooding.

g The provision of rules to ensure that the area at risk from ground deformation hazard, including fault rupture and tilting, along the Ostler Fault is managed to address the effects of subdivision and development on the safety of people and their property, within the Ostler Fault Hazard Area.

Explanation And Reasons

To minimise loss of life, damage to assets and disruption to the community, on-going research will be required to identify the extent and frequency of natural hazards and methods to mitigate "risks" to the community. Although this Council is not involved in primary research of this nature it is in a position continually to collate information and advise and inform the community of new findings. A hazards register is being continually updated which informs the community of the known hazards potentials of a given area. This is used both in the consent processes under the Resource Management Act 1991 and the Building Act 1991. In addition, emergency response plans are being continued and refined to help the community in times of a disaster.

Education about the consequences of earthquakes, drought and fire are considered the most practical means to mitigate these hazards. In addition, education about water use is also required. Council recognises, however, that monitoring of the long term trends in land use practices and patterns will be needed to enable assessment of whether the community is becoming increasingly vulnerable to these hazards. With respect to earthquakes and fire, the Building Code under the Building Act 1991, which the Council administers, sets standards so buildings will take into account the risk of earthquakes and fire.

Council considers the continuing development of a hazards register will provide a useful information base outlining the frequencies and extent of potential hazards in the District. Council considers a co-

ordinated approach is needed on methodology to monitor how the long term trends in land use practices and patterns may increase the vulnerability of communities to natural hazards. If the effects of a natural hazard cannot be avoided then Council considers they should be mitigated as far as possible by a community well prepared for a hazard.

River Flooding

Over the years stopbanks have been constructed, riverbanks planted and stabilised, riverbed levels lowered by gravel extraction and channels straightened by the Canterbury Regional Council to reduce the potential for flooding. In addition, flood warning measures have been introduced by the Canterbury Regional Council. While these operations do much to avoid or mitigate flood events, the Council recognises that some controls on building and subdivision in specific areas are required to limit or control the nature of development in floodable areas.

Areas that are subject to flooding, shown on planning maps, were identified by the former South Canterbury Catchment Board and further refined by the Canterbury Regional Council staff. However, as these are broad assessments of the likely flood potential site specific information will be required for any development in these areas.