

## 22 Natural Hazards

### 22.1 Introduction

This chapter contains a summary section 32 evaluation of the objectives, policies, rules and methods contained in Chapter 22: Natural Hazards chapter of the Proposed District Plan. This is a City-wide chapter which is relevant to all parts of the City but particularly for areas identified as potentially affected by natural hazards (refer to hazard areas identified proposed Planning Maps in Volume 2). Other objectives, policies and rules and methods relevant to Natural Hazards are identified in other chapters and their respective section 32 evaluations (e.g. Subdivision in Chapter 23). This section 32 evaluation should be read together with the text of the Proposed District Plan itself.

A natural hazard is the result of natural processes that form, shape and alter the environment. Natural hazards are any atmospheric, earth or water-related occurrence that adversely affects or may adversely affect human life, property or the environment. They include earthquakes, tsunamis, erosion, volcanic and geothermal activity, landslips, subsidence, sedimentation, wind, drought, fire, and flooding.

Hazard risk is the likelihood or probability of a natural hazard event occurring combined with its impact. The likelihood of some natural hazards events occurring within a 100 year planning timeframe for example can range from very rare (e.g. large earthquakes, volcanic eruptions) to likely or almost certain (e.g. flooding).

The potential impact (and consequentially the risk) presented by hazard events depends on the susceptibility of the land use within the affected area. For example, deep flooding in an open pasture makes the land unusable for a period but overall has a low impact, therefore the risk is low. If that open field was replaced with a hospital or an apartment then the impact of that same flood event would be high, with critical health services unavailable, people's lives in danger and property damaged or destroyed. In this second situation the risk is considerably higher.

The emphasis on the management of natural hazards in Chapter 22: Natural Hazards is to avoid situations where people put themselves, their property and the environment at unacceptable levels of risk from natural hazards.

Flooding and land instability (erosion, landslips and subsidence) are natural hazards of particular relevance to Hamilton. It is these hazards that this chapter focuses on. Other natural hazards are either not relevant to Hamilton (e.g. proximity to sources – coastline, active faultlines, volcanic/geothermal areas, see Civil Defence Emergency Management Plan), extremely unlikely, managed by other statutory instruments or processes and/or where the District Plan would not be the most effective or efficient way of managing that particular natural hazard.

Appendix A contains references to key documents, standards and legislation.

Appendix B contains discussion on resource management issues and Council's statutory responsibilities under s32 of the Act regarding natural hazards.

Appendix C contains relevant extracts from the operative Regional Policy Statement.

Appendix D contains relevant extracts from the proposed Regional Policy Statement.

Appendix E contains examples of relevant District Plan approaches and tools for the management of natural hazard risk.

## 22.2 Objectives

<i>Objective most appropriate to achieve the purpose of the Act:</i>	
<p><b>22.2.1</b> Manage activities to avoid or mitigate adverse effects on, and minimise risk to:</p> <p>People Property; and The environment from natural hazards.</p>	<p>‘Activities’ include subdivision, use and development.</p> <p>This objective is most appropriate to achieve the purpose of the Act because:</p> <ul style="list-style-type: none"> <li>• It provides for the control of the use, development and protection of land for the purpose of avoiding or mitigating adverse effects of natural hazards on, and minimising risk to people, property and the environment.</li> <li>• It is sufficiently broad enough to provide for a tailored management approach to policies and methods that recognise that the nature, scale and intensity of activities and natural hazards vary, and that different responses may be appropriate in different situations. For example, this enables policies that seek to avoid development in areas subject to a high flood hazard risks while providing opportunities for assessment and potential mitigation in other lesser flood hazard areas.</li> <li>• It meets the specific legislative requirements regarding the function of territorial authorities.</li> <li>• It gives effect or has regard (as appropriate) to relevant national and regional policies, plans and strategies.</li> <li>• It is achievable through the proposed policies, rules and other methods.</li> </ul>
<i>Objectives not the most appropriate to achieve the purpose of the Act:</i>	
<p>No objective.</p>	<p>This option is not the most appropriate to achieve the purpose of the Act because:</p> <ul style="list-style-type: none"> <li>• Having no objective regarding natural hazards gives no guidance on assessing activities in relation to natural hazards and provides no certainty that use and development of land will avoid or mitigate the adverse effects of natural hazards.</li> <li>• This option does not meet the specific legislative requirements regarding the function of territorial authorities.</li> <li>• This option does not give effect or have regard (as</li> </ul>

	appropriate) to relevant national and regional policies, plans and strategies.
As proposed but excluding protection of any of the three elements – people, property, environment.	<p>This option is not the most appropriate to achieving the purpose of the Act because:</p> <ul style="list-style-type: none"> <li>• An integrated approach to considering the adverse effects of natural hazards with the nature, scale and intensity of activities is needed to understand the level and ultimately acceptability of risk for any proposal. Consideration of each factor in the objective is a necessary component of this process and is needed to ensure sustainable management is promoted. The appropriateness of the objective in achieving the purpose of the Act is compromised if one or more elements are removed.</li> <li>• This option does not meet the specific legislative requirements regarding the function of territorial authorities.</li> <li>• This option does not give effect or have regard (as appropriate) to relevant national and regional policies, plans and strategies.</li> </ul>
To identify the impacts from natural hazards on people, property and the environment.	<p>This option is not the most appropriate to achieving the purpose of the Act because:</p> <ul style="list-style-type: none"> <li>• Its scope is limited to identification and mitigation. It does not recognise that in some circumstances avoidance may be the most suitable response.</li> <li>• This option does not fully meet the specific legislative requirements regarding the function of territorial authorities.</li> <li>• This option gives only partial effect or some regard (as appropriate) to relevant national and regional policies, plans and strategies.</li> </ul>
To prevent all activities in areas affected by natural hazards to avoid adverse effects on, and risks to people, property and the environment.	<p>This option is not the most appropriate to achieving the purpose of the Act because:</p> <ul style="list-style-type: none"> <li>• While it may avoid exposing people, property and the environment to adverse effects of natural hazards it also prevents any other use of the land – this provides no recognition of the level of risk involved. It does not recognise that there are activities with varying tolerances to natural hazards, that the effects of natural hazards varies, that mitigation options may exist and be appropriate, and would result in an inefficient use of land (physical resource).</li> <li>• This option does not fully meet the specific</li> </ul>

	<p>legislative requirements regarding the function of territorial authorities.</p> <ul style="list-style-type: none"> <li>This option gives only partial effect or some regard (as appropriate) to relevant national and regional policies, plans and strategies.</li> </ul>
--	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**Conclusion:** Taking into account the above, Council considers that the objective in this chapter of the plan are the most appropriate to achieve the purpose of the Act.

## 22.3 Policies

<i>Policies most appropriate to achieve the objective:</i>																																																																																	
<p><b>22.2.1</b> Manage activities to avoid or mitigate adverse effects on, and minimise risk to:</p> <p>People Property; and The environment from natural hazards.</p>																																																																																	
<i>Policies</i>	<i>Effectiveness, efficiency, costs and benefits</i>																																																																																
<p><b>22.2.1a</b> Subdivision, use and development shall be managed to reduce the risks from natural hazards to an acceptable level, including by:</p> <p>i. Ensuring risk is assessed for new activities on land subject to natural hazards.</p> <p>ii. Reducing the risk to which existing use and development is exposed where these risks are considered unacceptable.</p> <p>iii. Controlling new use and development in areas subject to significant natural hazards to ensure that the natural hazard risk does not exceed acceptable levels.</p> <p>iv. Taking a precautionary</p>	<p>22.2.1a policies are generally applicable to natural hazards other than flooding and land instability and not spatially constrained to natural hazard areas identified in the planning maps. The applicability of other policies is summarised in the table below.</p> <table border="1"> <thead> <tr> <th>Policy</th> <th>City-wide</th> <th>High Flood Hazard Area</th> <th>Medium Flood Hazard Area</th> <th>Low Flood Hazard Area</th> <th>Culvert Block Flood Hazard Area</th> <th>Temple View Flood Hazard Area</th> <th>Waikato Riverbank and Gully Hazard Area</th> </tr> </thead> <tbody> <tr> <td>22.2.1a</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>22.2.1b</td> <td></td> <td>✓</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>22.2.1c</td> <td></td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>22.2.1d</td> <td></td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> </tr> <tr> <td>22.2.1e</td> <td></td> <td>✓</td> <td>✓</td> <td></td> <td>✓</td> <td>✓</td> <td></td> </tr> <tr> <td>22.2.1f</td> <td></td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> </tr> <tr> <td>22.2.1g</td> <td></td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> </tr> <tr> <td>22.2.1h</td> <td></td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> </tr> <tr> <td>22.2.1i</td> <td></td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> </tr> </tbody> </table>	Policy	City-wide	High Flood Hazard Area	Medium Flood Hazard Area	Low Flood Hazard Area	Culvert Block Flood Hazard Area	Temple View Flood Hazard Area	Waikato Riverbank and Gully Hazard Area	22.2.1a	✓	✓	✓	✓	✓	✓	✓	22.2.1b		✓						22.2.1c		✓	✓	✓	✓	✓	✓	22.2.1d		✓	✓	✓	✓	✓		22.2.1e		✓	✓		✓	✓		22.2.1f		✓	✓	✓	✓	✓		22.2.1g		✓	✓	✓	✓	✓		22.2.1h		✓	✓	✓	✓	✓		22.2.1i		✓	✓	✓	✓	✓	
Policy	City-wide	High Flood Hazard Area	Medium Flood Hazard Area	Low Flood Hazard Area	Culvert Block Flood Hazard Area	Temple View Flood Hazard Area	Waikato Riverbank and Gully Hazard Area																																																																										
22.2.1a	✓	✓	✓	✓	✓	✓	✓																																																																										
22.2.1b		✓																																																																															
22.2.1c		✓	✓	✓	✓	✓	✓																																																																										
22.2.1d		✓	✓	✓	✓	✓																																																																											
22.2.1e		✓	✓		✓	✓																																																																											
22.2.1f		✓	✓	✓	✓	✓																																																																											
22.2.1g		✓	✓	✓	✓	✓																																																																											
22.2.1h		✓	✓	✓	✓	✓																																																																											
22.2.1i		✓	✓	✓	✓	✓																																																																											

<p>approach by minimising the vulnerability of new development adjoining natural hazard areas.</p> <p>v. Recognising that sites may be subject to multiple hazards and the potential cumulative effect this may create.</p> <p>vi. When mitigation options are being considered in response to unacceptable hazard risks, giving priority to the use of non-structural solutions over new construction of natural hazard protection works or structures.</p> <p>vii. Recognising, maintaining or enhancing the role of natural features to avoid or minimise natural hazards.</p> <p>viii. Ensuring new activities do not create new or exacerbate existing natural hazards.</p> <p>ix. Having regard to the actual or potential effects of climate change on the occurrence or severity of natural hazards.</p> <p>x. Recognising that providing for redevelopment resulting in an increased level of development on site may create opportunities to reduce the overall level of existing risk.</p> <p><b>Subdivision</b></p> <p><b>22.2.1b</b> Subdivision that increases the demand or potential for</p>	22.2.1j		✓	✓	✓	✓	✓	
	22.2.1k		✓	✓	✓	✓	✓	
	22.2.1l							✓
	22.2.1m							✓
	<p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>• Provides clear guidance for managing activities in a way that ensures levels of risk are reduced to a level acceptable in the context, and circumstances where the level of risk should be considered unacceptable.</li> <li>• Recognises the net benefits to risk reduction arising from providing for redevelopment opportunities within areas affected by natural hazards.</li> <li>• Ensures the effects of natural hazards are assessed and that new activities ensure people, property and the environment are protected from adverse effects of natural hazards, including the cumulative effects of multiple natural hazards and the effects of climate change on the frequency and severity of hazard events.</li> <li>• Protects the functions of natural resources by establishing preferences for non-structural hazard mitigation measures.</li> <li>• Encourages a long term evolution of land use patterns and infrastructure networks that creates a more resilient community.</li> <li>• Avoids costs of subsequent remedial works and costs and dangers in responding to and recovering from natural hazard events. Fewer people/less property at risk or affected by an event means less resources needed to respond during that event, less community disruption, less financial costs and a faster recovery phase.</li> <li>• Development pressure for intensive uses on constrained land is reduced, potentially creating opportunities for tolerant uses that might not otherwise be considered 'economically' feasible (e.g. more open space, larger green spaces/ecological corridors).</li> <li>• Less development opportunities because of natural hazard constraints reduces pressure on natural landscapes and features within these areas</li> </ul>							

<p>a greater number or extent of buildings and structures within the High Flood Hazard Areas shall be avoided.</p> <p><b>22.2.1c</b> Subdivision creating new allotments shall ensure building platforms are identified and located on parts of the site that are free from any Hazard Area.</p> <p><b>22.2.1d</b> Subdivision within a Flood Hazard Area shall only be allowed when:</p> <ol style="list-style-type: none"> <li>i. The adverse effects of a flood event have been minimised and risk reduced to an acceptable level.</li> <li>ii. The activity does not create a new or exacerbate existing flood hazards.</li> </ol> <p><b>Flood Hazard Areas</b></p> <p><b>22.2.1e</b> New use and development that is vulnerable to the adverse effects of flooding events (e.g. residential units) shall avoid High and Medium Flood Hazard Areas, Culvert Block Flood Hazard Areas and the Temple View Flood Hazard Area.</p> <p><b>22.2.1f</b> Provide for new use and development that is tolerant of the adverse effects of flooding events to be carried out in Flood Hazard Areas.</p> <p><b>22.2.1g</b> New essential service infrastructure shall avoid Flood Hazard Areas if the infrastructure could become</p>	<p>(e.g. river and gullies, trees and vegetation).</p> <p><b>Costs</b></p> <ul style="list-style-type: none"> <li>• Costs of research and analysis to identify hazard areas, and ongoing costs of maintaining, updating and improving this information – including costs of changing the plan to update the extent of hazard areas shown in the planning maps.</li> <li>• Will result in investigative and assessment costs for proposals on land affected by natural hazards.</li> <li>• Reduces development options or flexibility for land affected by natural hazards.</li> <li>• Will require mitigation actions to be undertaken for some activities, with associated costs (financial costs vary, but are less expensive to incorporate in initial design than to retrofit).</li> </ul> <p><b>Efficient and Effective</b></p> <ul style="list-style-type: none"> <li>• This group of policies will be efficient and effective to achieve objective 22.2.1.</li> <li>• The potential consequences of allowing activities within areas affected by natural hazard events vary according to the nature and scale of the proposed activity. The hazard areas identified within this District Plan are affected by potentially significant hazards.</li> <li>• Some land uses have the effect of concentrating people into defined locations. Concentrating people in locations (e.g., residential activities at urban densities) that may be subject to natural hazards creates a greater risk than if the land was used only for lower population uses.</li> <li>• Some activities are regionally significant or are vital for emergency response and disaster recovery, including hospitals, emergency service facilities, and “lifeline” utilities. These activities need to be located in areas where their exposure to natural hazards is minimised. In some situations it will be impossible to provide lifeline utility services to the City without entering a hazard area (e.g., Three Waters infrastructure or the strategic transport network crossing the Waikato River). Where it has been established that there is no reasonable or practical alternative that would avoid a hazard area, then the activity should be allowed to proceed in a manner that minimises the level of risk.</li> </ul>
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p>unusable or inaccessible during flood events.</p> <p><b>22.2.1h</b> New regionally significant infrastructure shall be allowed within a Flood Hazard Area only when:</p> <ol style="list-style-type: none"> <li>i. The infrastructure can not reasonably or practicably be located elsewhere.</li> <li>ii. The adverse effects of a flood event on the infrastructure are minimised.</li> </ol> <p><b>22.2.1i</b> New use and development within a Flood Hazard Area shall only be allowed when:</p> <ol style="list-style-type: none"> <li>i. The adverse effects of a flood event have been minimised and risk reduced to an acceptable level.</li> <li>ii. The activity does not create a new or exacerbate existing flood hazards.</li> </ol> <p><b>22.2.1j</b> New development shall avoid overland flow paths.</p> <p><b>22.2.1k</b> New development shall be considered in areas subject to ponding hazards only where:</p> <ol style="list-style-type: none"> <li>i. The extent of ponding is localised and not part of a widespread and contiguous ponding hazard.</li> <li>ii. The ponding depth does not hinder safe movement by the expected users of the</li> </ol>	<ul style="list-style-type: none"> <li>• Some activities are not sensitive to the effects of natural hazards and are considered low risk. These should be allowed to occur in hazard areas. Examples include outdoor recreational spaces and their associated activities, gardens and other open spaces (public or private), and use as part of the City’s walking and cycling network. This ensures that the land is still able to contribute towards the functioning of the City, while minimising the consequences of a natural hazard event.</li> <li>• To achieve the objective new activities should not be allowed to create a new, or exacerbate an existing, hazard, e.g. development which diverts flood water on to a neighbouring site or alters the hydrological capacity of a flood plain. These include walls, fences, earthworks, vegetation removal, construction of buildings and structures, and increasing impervious surfaces.</li> <li>• These policies describe the technical criteria and parameters around flood assessment and the desired outcomes. They therefore provide a basis and rationale for decision-making in respect of flood events.</li> <li>• The policies are in many respects restatements of provisions in policy statements (such as the Regional Policy Statement and the Act itself) or are procedural (state actions that are required). As such they are fair representations of statutory requirements and therefore meet the Act’s purpose.</li> <li>• The benefits and expected outcomes of the policies outweigh the respective costs.</li> </ul>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p>development and evacuation routes are maintained.</p> <p><b>Waikato Riverbank and Gully Hazard Area</b></p> <p><b>22.2.1l</b> New use and development which is vulnerable to the adverse effects of land instability shall avoid the Waikato Riverbank and Gully Hazard Area.</p> <p><b>22.2.1m</b> New use and development which is tolerant of the adverse effects of land instability shall be provided for in the Waikato Riverbank and Gully Hazard Area.</p>	
<b><i>Policies not most appropriate to achieve the objectives:</i></b>	
<p>Subdivision, use and development shall avoid areas affected by natural hazards.</p>	<p>While this policy would avoid exposing people and property to adverse effects of natural hazards it also prevents any other use of the land. This approach provides no recognition of the level of risk involved and that some types of uses of land in hazard areas may be acceptable. It does not recognise that there are activities with varying tolerances to natural hazards, that the effects of natural hazards varies, that mitigation options may exist and be appropriate, and would result in an inefficient use of land (physical resource).</p>
<p>Subdivision, use and development should be allowed in areas affected by natural hazards if the adverse effects of natural hazard can be avoided or mitigated.</p>	<p>This policy just restates the objective and provides little guidance on how the objective should be achieved.</p>

### Risks

With regards to natural hazards, there is generally sufficient information upon which to base analysis as to the appropriateness of acting or not acting. There is, however, often scientific and statistical uncertainty associated with the understanding of natural hazards and the potential effects on use and development. The risks associated with acting and not acting is outlined as follows:



## Risks of not acting

- The vulnerability of use and development to natural hazards is understated.
- The community becomes more vulnerable to the effects of natural hazards.
- Natural hazard guidance with regard to new land use is too general, leading to inconsistent decision making and development uncertainty.
- Subdivision, use and development occur in a manner that increases risk to people, property and the environment.

## Risks of acting

- The vulnerability of use and development to the effects of natural hazards is overstated, leading to unnecessary constraints on the subdivision, use and development of land.

**Conclusion:** Taking into account the above, Council considers that the policies in this chapter are most appropriate to achieve the objective.

## 22.4 Rules

<i>Rules most appropriate to achieve the objectives:</i>	
<i>Method</i>	<i>Effectiveness, efficiency, costs and benefits</i>
<p><b>Planning Maps</b></p> <p>Identifying natural hazard areas on planning maps.</p>	<p>This requires Council to undertake a process of researching, assessing and determining hazard areas (and categories in the case of flood hazards). These areas would then be shown on planning maps, linked to policies and rules.</p> <p>Council must make information it holds on natural hazards available. Information that is of an appropriate level of certainty (under Local Government Official Information Act 1987) must be included in Land Information Memorandum (and can be acted upon to some degree under s106 of the Act and the Building Act regardless of the content of the District Plan). Council needs natural hazard information for its own asset management purposes, to support regional consent information requirements (e.g. integrated catchment management plans) and to enable it to fulfil its functions and duties under a range of legislation (e.g. Resource Management Act, Local Government Act, Civil Defence Emergency Management Act).</p> <p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>• Provides certainty as to what land is subject to proposed plan provisions.</li> <li>• Avoids applicants incurring costs of investigating whether sites may be subject to natural hazards in</li> </ul>

	<p>order to determine whether Plan provisions apply.</p> <ul style="list-style-type: none"> <li>• Based on clear, technically robust, parameters for determining hazard areas (e.g. floodwater depth vs velocity).</li> <li>• Good customer service and improved ‘visibility’ of natural hazards within the City.</li> </ul> <p><b>Costs</b></p> <ul style="list-style-type: none"> <li>• Council costs of research and analysis to identify hazard areas, and ongoing costs of maintaining, updating and improving this information – including costs of changing the plan to update the extent of hazard areas shown in the planning maps.</li> <li>• Risk of misinterpreting information. Lines on a map can often create first impressions that do not reflect the methodology, assumptions and caveats of the information used to create the line and the purpose for which it has been created. Identified hazard areas should not be interpreted as meaning significant flooding or land instability is certain to occur in these areas or that on land outside these areas there will be no flooding or land instability. They are a risk management tool to help with the management of activities and natural hazards.</li> <li>• Negative perception of affecting property values (however case law has established that this is not necessarily a matter to have regard to in decision making under the Act) and/or ability to gain insurance or increased cost of insurance premiums or excesses (determined by policies of individual insurers).</li> </ul> <p><b>Efficient and Effective</b></p> <ul style="list-style-type: none"> <li>• This method will be efficient and effective way to support objective 22.2.1 and policies 22.2.1a to 22.2.1m.</li> <li>• Overall, this method is an efficient way of defining land possibly affected by natural hazards to which an effective policy and rule framework, based on the hazard (and its significance in the case of flood hazard categories), can be applied.</li> <li>• As a means of managing risk on a City-wide basis this approach will be effective. The effectiveness in this Plan is reduced (in relation to flood hazards) because detailed modelling is not available for all catchments. By setting up the framework for</li> </ul>
--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

	<p>natural hazards more detailed information can be easily incorporated into the Plan when it becomes available, (i.e. changes to the extent of hazard areas, not changes to the objective, policy or rules associated with those hazard areas).</p> <ul style="list-style-type: none"> <li>Retaining flood hazard areas from the operative plan where no additional information is available and including consideration as part of subdivision is an effective and efficient way of ensuring some level of natural hazard management is undertaken for these balance areas. The benefits and expected outcomes of this option outweigh the respective costs.</li> </ul>
<p><b>Activity Status Table</b></p> <p>Consent status of activities within identified natural hazard areas</p>	<p>The consent status of activities has been established to recognise that different activities have different sensitivities to the effects of natural hazards. It includes direct references to activities identified by the proposed Regional Policy Statement and reflects hazard categories established as part of flood hazard modelling.</p> <p>Activities that are vulnerable to the effects of flooding or are vital during a natural hazard event (e.g. emergency facilities) and/or are critical to the functioning of the City and its recovery (e.g. lifeline utilities), are generally identified as non-complying activities in high flood hazard areas. They become discretionary activities within other hazard areas - with the exception of some particularly vulnerable activities (e.g. residential, childcare facilities, schools). Discretionary activity status also applies when these activities occur in hazard areas where the effect of the hazard is less significant.</p> <p>Activities that are tolerant to natural hazard effects are generally identified as permitted activities, although in some cases these are subject to rules to ensure any potential effects are managed.</p> <p>The activity status of essential services and regionally significant infrastructure is also varied by hazard area to reflect whether it is at, above or below ground. This recognises that at and below ground activities are affected by land instability, but lines passing above are not (support structure would be considered as 'at ground'). Similarly underground infrastructure and stormwater infrastructure do not require Plan intervention when within flood hazard areas.</p> <p>Prohibited activity statuses were considered but discounted because there may be situations where</p>

	<p>mitigation options can avoid the risk (e.g. stormwater infrastructure improvements as part of a proposal can reduce the extent of the hazard area) or site specific assessment could provide a more refined hazard area boundary. This is apparent in greenfield growth areas where no or minimal stormwater infrastructure exists and where subdivision design would ensure secondary overland flowpaths are in channels or roads, and not on that part of land containing buildings or structures.</p> <p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>• Provides certainty on which activities are considered appropriate or inappropriate in the various hazard areas (subject to standards), or where detailed and specific assessment and scrutiny via a consent process is required to demonstrate:       <ol style="list-style-type: none"> <li>i. Objectives and policies are met.</li> <li>ii. Adverse effects of natural hazard avoided or minimised.</li> <li>iii. Risk to people, property and the environment minimised.</li> </ol> </li> <li>• Provides a broad risk categorisation which reflects the severity of natural hazards against the sensitivity of activities.</li> </ul> <p><b>Costs</b></p> <ul style="list-style-type: none"> <li>• Financial and time costs to prepare applications for activities requiring consent and uncertainty over whether these would be approved.</li> <li>• Development opportunities or flexibility may be restricted (off set by other development restrictions – e.g. Significant Natural Areas, open space zoning, regional plan restrictions).</li> <li>• Financial costs of proposed mitigation measures.</li> </ul> <p><b>Efficient and Effective</b></p> <ul style="list-style-type: none"> <li>• This method will be efficient and effective way to support objective 22.2.1 and policies 22.2.1a to 22.2.1m.</li> <li>• This method provides certainty that tolerant/low risk activities can occur (efficiency) whilst ensuring that vulnerable/higher risk activities are scrutinised through a consent process (effective).</li> <li>• The benefits and expected outcomes of this option outweigh the respective costs.</li> </ul>
--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p><b>General Standards</b></p> <p>22.4.1 Impermeable Surfaces</p>	<p>This rule applies to that part of any site within a Hazard Area.</p> <p>This rule has been carried over from the Operative District Plan. No monitoring information is available, suggesting the provision needs altering.</p> <p>In effect this creates a minimum permeable area.</p> <p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>• Helps manage the rates of stormwater run-off by reducing the amount of hard surface. Water can run faster across hard surfaces (e.g. driveways, concreted or paved areas), this can increase erosion and peak flood levels (i.e. water falling in a catchment gets to low points and overland flow paths faster and over a shorter period).</li> <li>• Allows for some on site mitigation of stormwater quality and quantity (in small events) by creating permeable spaces.</li> <li>• Can create opportunities for amenity improvements such as tree and vegetation planting on land which may have otherwise been under pressure to be developed.</li> <li>• The exclusion for transport corridors recognises that in most situations this infrastructure will need to have large areas of impermeable surfaces.</li> </ul> <p><b>Costs</b></p> <ul style="list-style-type: none"> <li>• Reduced development opportunities and flexibility for developers.</li> <li>• Council costs of monitoring compliance.</li> </ul> <p><b>Efficient and Effective</b></p> <ul style="list-style-type: none"> <li>• This method will be efficient and effective way to support objective 22.2.1 and policies 22.2.1a, 22.2.1d-f, 22.2.1h-j, and 22.2.1l-m.</li> <li>• While potentially not as effective at mitigating the effects of activities on flood hazards or erosion as hard engineered stormwater infrastructure or large scale stormwater ponds, this method represents a cost effective, small scale, low impact design solution that can positively contribute to the management of stormwater and erosion.</li> <li>• As a standard for permitted activities this assists in mitigating the effects of natural hazards without the need for scrutinising tolerant or low risk activities through a consent process (efficient).</li> </ul>
--------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

	<ul style="list-style-type: none"> <li>The benefits and expected outcomes of this option outweigh the respective costs.</li> </ul>
<p><b>Specific Standards</b></p> <p>22.5.1 Earthworks Ancillary to a Permitted Activity (Waikato Riverbank and Gully Area).</p> <p>22.5.2 Earthworks Ancillary to a Permitted Activity (Flood Hazard Areas).</p> <p>22.5.3 External Storage of Goods and Materials.</p> <p>22.5.4 Removal of Trees and Other Vegetation.</p> <p>22.5.5 Fences and Walls.</p> <p>22.5.6 New Buildings, Replacement or Rebuilding of Existing Lawfully Established Buildings, and Alterations or Additions to Existing Buildings.</p> <p>22.5.7 Vulnerable activities, Essential services and Regionally Significant Infrastructure.</p> <p>22.5.8 Lifeline Utilities (Above Ground Level).</p> <p>22.5.9 Swimming Pools.</p>	<p>These standards apply to specific permitted activities and in hazard areas.</p> <p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>Sets minimum standards for a range of activities to mitigate the effects of natural hazards and minimise risks to an acceptable level. Compliance with these standards means these activities are permitted without the need for a resource consent process. This avoids financial and time costs associated with a resource consent process and provides certainty for the proposal.</li> </ul> <p><b>Costs</b></p> <ul style="list-style-type: none"> <li>Design and construction cost of compliance with standards (e.g. minimum floor levels/freeboard).</li> <li>Additional costs will vary according to the specific nature of the site, proposal and hazard. Cost/benefit analysis (see especially “Impacts of Climate Change on Urban Infrastructure and the Built Environment: Toolbox”, 2012) generally demonstrates that additional costs associated with ensuring sufficient freeboards are outweighed by the costs associated with repairing damage caused by inundation.</li> <li>Elevated floor levels may hinder access for people with physical disabilities or reduced mobility (e.g. elderly) or incur additional design and construction costs to provide for access needs.</li> <li>Limits development opportunities and flexibility (e.g. setbacks).</li> <li>Financial and time costs for proposals that are not able to comply with the standards (Restricted Discretionary Activities) and uncertainty for the applicant as to whether consents would be granted.</li> <li>Costs to Council of monitoring and enforcement of compliance with standards.</li> </ul> <p><b>Efficient and Effective</b></p> <ul style="list-style-type: none"> <li>This method will be efficient and effective way to support objective 22.2.1 and policies 22.2.1a to 22.2.1m.</li> <li>As a standard for permitted activities this assists in mitigating the effects of natural hazards (effective</li> </ul>

	<p>– if monitored and enforced) without the need for scrutinising tolerant or low risk activities through a consent process (efficient).</p> <ul style="list-style-type: none"> <li>The benefits and expected outcomes of this option outweigh the respective costs.</li> </ul>
<p><b>Assessment Criteria</b></p> <p><b>Specific Standard</b></p> <p>22.8 Non-complying activities in a Flood Hazard Area.</p>	<p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>Activities which do not meet the standards are restricted discretionary activities. These assessment criteria include general criteria relating to the effects of not complying with a standard, and the extent to which the proposal is consistent with objectives and policies of the natural hazards chapter, zone and other identified chapters.</li> <li>Provides clarity on the matters which will be considered for restricted discretionary activities, and guidance for assessment of discretionary and non-complying activities.</li> <li>Clarifies expectations with respect to subdivision, use and development in areas affected by natural hazards.</li> <li>Provides specific recognition that site and proposal specific assessments and information should be considered with the information already held by Council (and used to develop the hazard areas). Allows Council to consider appropriately prepared flood risk assessment reports as satisfying the s104D 'gateway' test for non-complying activities.</li> </ul> <p><b>Costs</b></p> <ul style="list-style-type: none"> <li>No identified costs from clarifying in the Plan the matters which will be considered when processing an application, although the clarification of efficiency and safety expectations may affect the nature and extent of mitigation that may be required. In turn this would have financial costs.</li> </ul> <p><b>Efficient and Effective</b></p> <ul style="list-style-type: none"> <li>These rules will be efficient and effective to achieve objective 22.2.1 by identifying a list of matters which cross-reference back to the objective and policies, as well as identifying matters that will be considered when processing resource consent applications.</li> <li>The benefits and expected outcomes of this option outweigh the respective costs.</li> </ul>
<p><b>Information Requirements</b></p>	<p>Activities requiring consent in hazard areas may be</p>

<p>Especially:</p> <p>Flood Risk Assessment Report.</p> <p>Site Management Plan.</p> <p>Stormwater Disposal Report.</p>	<p>required to provide technical reports as part of information requirements for resource consent applications.</p> <p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>• Provides clarity and certainty of nature and type of information required for proposals.</li> <li>• Ensures relevant matters are considered and reported on which assists in efficient assessment and determination of consents.</li> </ul> <p><b>Costs</b></p> <ul style="list-style-type: none"> <li>• Time and financial cost of commissioning, preparing and providing information, some of which will require technical assistance (degree of information required off-set by the scale of a proposal).</li> <li>• Costs associated with administering this process to ensure that this information requirement is provided to a sufficient level of detail.</li> </ul> <p><b>Efficient and Effective</b></p> <ul style="list-style-type: none"> <li>• The rules provide a clear framework for users of the Plan to determine information requirements and set clear parameters as to when more detailed analysis is required to address the potential effects and risk of the proposal, in relation to natural hazards.</li> <li>• The effects of climate change should be considered as part of the Risk Assessment Report. In addition to Ministry for Environment guidance reports, the Hamilton City Council Infrastructure Technical Specifications contain guidance on the effects of climate change on temperature. Providing guidance on the effect of climate change, and requiring consideration as part of information requirements is considered an efficient way of addressing this matter. The benefits and expected outcomes of this option outweigh the respective costs.</li> </ul>
<p><i>Rules not the most appropriate to achieve the objectives:</i></p>	
<p><b>Planning Maps</b></p> <p>Not identifying natural hazard areas on planning maps.</p>	<p>This would involve providing a definition of the natural hazard (e.g. 1% Annual exceedance probability AEP flood event, slopes, soil types), but leaving it up to developers to undertake the research and investigation required to work out whether they are on land affected by natural hazards. This would</p>



	<p>require all permitted activities to supply evidence to Council that the property were not affected by the defined hazard (potentially similar structure/approach to the National Environmental Standards (NES) on contaminants in soil).</p> <p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>• Avoids costs associated with updates to planning maps as hazard areas change (e.g. flood hazard extent changes as a result of development and infrastructure improvement, improved information or modelling).</li> <li>• Avoids costs of Council preparing natural hazard information.</li> </ul> <p><b>Costs</b></p> <ul style="list-style-type: none"> <li>• Costs of research and analysis to identify hazard areas fall on developers – potentially unnecessary costs imposed if subsequent investigations demonstrate the land is not subject to natural hazards.</li> <li>• Would require analysis beyond the subject site to understand the site context within the catchment. This adds to cost and likely to make smaller developments unaffordable.</li> <li>• Relies on defining a methodology and assumptions within the plan for identifying hazard areas. This locks in one method and set of assumptions. It does not provide for improvements in methodology or technologies.</li> <li>• Poor customer service and ‘visibility’ of natural hazards within the City. Does not accrue education benefits or contribute to a wider understanding of natural hazards in the City via the Plan.</li> <li>• Does not give effect to Councils duty to ‘identify’ areas affected by natural hazards (operative and proposed Regional Policy Statement). Council needs to map hazard areas in order to fulfil its functions and duties; given that information was fit for purpose, it would be an inefficient use of resources to not use it in the Plan.</li> </ul> <p><b>Efficient and Effective</b></p> <ul style="list-style-type: none"> <li>• Overall, this method is not an efficient way of defining hazard areas. As a means of managing risk on a City-wide basis this approach is not effective as it is ad hoc and provides no ability to</li> </ul>
--	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

	<p>comprehensively understand and consider risk.</p> <ul style="list-style-type: none"> <li>The benefits and expected outcomes of this option do not outweigh the respective costs.</li> </ul>
<p><b>Activity Status Table</b></p> <p>Consent status of activities – All permitted, without standards</p>	<p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>To developers as there are no constraints or compliance costs on development established by plan.</li> </ul> <p><b>Costs</b></p> <ul style="list-style-type: none"> <li>Provides no certainty that new subdivision, use or development in hazard areas will not be subject to unacceptable levels of risk (some managed by s106 of the Act and the Building Act 2004).</li> </ul> <p><b>Efficient and Effective</b></p> <ul style="list-style-type: none"> <li>This is not an effective way to achieve the objective. There would be a reliance solely on other methods outside the plan to achieve the objective which are not sufficient to fully manage subdivision, development and use in relation to natural hazards.</li> <li>The benefits and expected outcomes of this option do not outweigh the respective costs.</li> </ul>

### Risks

Risks of acting or not acting.

- With regards to natural hazards, there is generally sufficient information upon which to base analysis as to the appropriateness of acting or not acting. There is, however, often scientific and statistical uncertainty associated with the understanding of natural hazards and the potential effects on use and development. The risks associated with acting and not acting is outlined below.

Risks of not acting

- The vulnerability of use and development to natural hazards is understated.
- The community becomes more vulnerable to the effects of natural hazards.
- Subdivision, use and development occur in a manner that results increases in risk to people, property and the environment.

Risks of acting

- The vulnerability of use and development to the effects of natural hazards is overstated, leading to unnecessary constraints on the subdivision, use and development of land.

## 22.5 Methods Other Than Rules

<i>Methods most appropriate to achieve the objectives:</i>	
<i>Method</i>	<i>Effectiveness, efficiency, costs and benefits</i>
<p><b>Regulatory Methods outside the District Plan:</b></p> <p>Additional matters for consenting process for land affected by instability or inundation in the Resource Management Act, section 106.</p> <p>Civil Defence Emergency Management Act 2002 and Civil Defence Emergency Management Plans.</p> <p>Soil Conservation and Rivers Control Act 1941.</p> <p>Consenting process and enforcement action under the Building Act 2004 and regulations.</p> <p>Bylaws.</p> <p>Also refer to “Natural Hazard Management – Research Report”, Tonkin and Taylor Ltd for the Ministry for the Environment, August 2006, which contains a comprehensive list of powers for the purposes of natural hazard management (Part 8, p55-91).</p>	<p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>Provides some specific powers to Council to manage some activities in relation to natural hazards, notwithstanding the content of the plan.</li> </ul> <p><b>Costs</b></p> <ul style="list-style-type: none"> <li>Administrative costs to Council to establish other regulatory methods, and costs to the community to undertake activities that are affected by the bylaw.</li> </ul> <p><b>Efficient and Effective</b></p> <ul style="list-style-type: none"> <li>These regulatory methods are complementary to those established in the proposed plan. The plan provides for an integrated management approach of activities for the purpose of reducing risk from natural hazard events.</li> <li>The stated benefits outweigh their likely costs.</li> </ul>
<p><b>Education and Advocacy</b></p> <p>Information from Land Information Memorandum/Project Information Memorandum</p> <p>Guides and technical advice include information on:</p> <ul style="list-style-type: none"> <li>Earthworks.</li> <li>Low-Impact Urban Design and</li> </ul>	<p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>Provides clear information to the community about the risk posed by natural hazards.</li> <li>Encourages communities to think about, prepare for and change their behaviour with regards to natural hazards. This supports the reduction and readiness aspects of natural hazard emergency management (CDEM) plan.</li> </ul> <p><b>Costs</b></p> <ul style="list-style-type: none"> <li>There will be financial costs to Council to promote</li> </ul>

<p>Development principles.</p> <p>Make available natural hazard information. Information about the risks of natural hazards should be provided to assist with the planning and preparation for natural hazard events.</p>	<p>these approaches.</p> <p><b>Efficient and Effective</b></p> <ul style="list-style-type: none"> <li>• These methods will be efficient and effective to support the objective by providing information to improve risk awareness, encourage self-preparedness and behavioural change.</li> <li>• These approaches are likely to have greater effect than regulatory approaches to existing development.</li> <li>• The proposed method is efficient in that its stated benefits outweigh their likely costs.</li> </ul>
<p><b>Council Projects and Initiatives (subject to LTP and Annual Plan)</b></p> <p>Develop Integrated Catchment Management Plans (ICMPs) and/or water impact assessments for the long-term sustainable management of water resources and align Council works with those Catchment Management Plans and river bank stability programmes.</p> <p>Maintain Hamilton City Infrastructure Technical Specifications, as a guide for acceptable engineering practice and design solutions.</p>	<p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>• The development of (ICMPs) for the long term sustainable management of water resources and the Hamilton City Infrastructure Technical Specifications will enable Council to provide a well-informed framework for the management of natural hazard flood risk within the City. Asset plans and works and services to increase efficiencies provide significant benefits through planning for, and undertaking, improvements to the Council (and Community) asset.</li> <li>• There are social benefits from these methods as it provides information, assessment, technical design details and physical works that are essential for developments to ensure protection of property and the environment and the health and safety of the community.</li> </ul> <p><b>Costs</b></p> <ul style="list-style-type: none"> <li>• There are significant financial costs to the Council and community to develop ICMPs and to undertake works and services.</li> </ul> <p><b>Efficient and Effective</b></p> <ul style="list-style-type: none"> <li>• These methods will be efficient and effective to support the objective by providing information to improve risk awareness and provide technical design solutions to reduce risk.</li> <li>• The proposed method is efficient in that its stated benefits outweigh their likely costs.</li> </ul>
<p><b>Collaboration and Partnership</b></p> <p>Collaborate with the Regional Council, Civil</p>	<p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>• Shared resourcing reduces unnecessary costs from duplication and provides access to specialist advice for those Councils with limited or no in-house</li> </ul>

<p>Defence, and other territorial authorities, to collect and analyse natural hazard risk information.</p> <p>Participate in any regional natural hazards forum to promote organisational integration and information sharing across jurisdictional and plan boundaries.</p>	<p>experts.</p> <ul style="list-style-type: none"> <li>• Improved consistency between authorities regarding natural hazard management.</li> <li>• Creates critical mass of resource/specialists to move beyond implementing best practice to research and creation of new best practices.</li> </ul> <p><b>Costs</b></p> <ul style="list-style-type: none"> <li>• Financial/opportunity cost to Council of assigning staff to participate in forums, share information and involvement in any joint work programmes.</li> </ul> <p><b>Efficient and Effective</b></p> <ul style="list-style-type: none"> <li>• These methods will be efficient and effective to achieve the objective by improving access to information and expertise regarding natural hazards.</li> <li>• Inter-jurisdictional consistency in approaches to natural hazard management reduces the planning framework complexity for cross-boundary activities or developers who work in multiple jurisdictions.</li> <li>• The proposed method is efficient in that its stated benefits outweigh their likely costs.</li> </ul>
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

## 22.6 References

- *Refer to Appendix A for a list of resources, documents, standards and legislation.*

## 22.7 Glossary

- *Refer to Volume 2, Appendix 1.7 of the Proposed District Plan.*

## Appendix A

### Referenced external resources, documents, standards and legislation

- *Resource Management Act 1991*
- *Hamilton City Plan (Operative 2012)*
- *Hamilton City Proposed District Plan S32 Report (October 1999)*
- *Hamilton City Variation 12 to the Proposed District Plan S32 Report (2010)*
- *Waikato Regional Policy Statement (Operative October 2000)*
- *Waikato Regional Policy Statement (Proposed November 2010)*
- *Waikato Regional Plan (Operative in part September 2007)*
- *Waikato (Operative in part June 2011), Franklin (Operative February 2007) and Waipa District Plans (Operative 1997)*
- *Local Government Act 2002*
- *Local Government Official Information Act 1987*
- *Civil Defence Emergency Management Act 2002*
- *Waikato Valley –Civil Defence Emergency Management Plan 2011-2015, Waikato CDEM Group.*
- *Building Act 2004 and Building Code*
- *Soil Conservation and Rivers Control Act 1941*
- *Future Proof Growth Strategy and Implementation Plan 2009*
- *City Strategy - Hamilton Urban Growth Strategy, April 2010*
- *NZS 4404: 2010 Land Development and Subdivision Infrastructure*
- *“Hazard Mapping in Hamilton City, New Zealand”, Hugh Blackstock, 2002, University of Waikato*
- *“Mapping Hazards in Hamilton”, Blackstock et al, 2002, University of Waikato*
- *“Natural Hazard Management – Research Report”, Tonkin and Taylor Ltd for the Ministry for the Environment, August 2006*
- *“Strengthening linkages between land use planning and emergency management in New Zealand”, Saunders et al, The Australian Journal of Emergency Managements, Vol. 22 No.1, February 2007.*
- *“How long is your piece of string – are current planning timeframes for natural hazards long enough?”, Saunders, GNS Science, Massey University.*
- *“Land use planning for natural hazards in New Zealand: the setting, barriers, burning issues and priority actions”, Glavovic et al, 2009, Springer.*
- *“Preparing for future flooding – A guide for local government in New Zealand”, Ministry for the Environment, May 2010.*

- 
- *“Impacts of Climate Change on Urban Infrastructure and the Built Environment: Toolbox”, NIWA, MWH, GNS and BRANZ, 2012*
  - *“Waikato and Waipa Rivers Flood Event 6-16 July 2002 – Final Technical Report”, Munro, 12 August 2002, Environment Waikato*
  - *“Seismic Risk to Underground Services, Hamilton City”, Peter Hodder and Vicki Moon, University of Waikato, 1994*
  - *“Karapiro Dam: Report on Dam Break Analysis”, Works Consultancy Services for ECNZ, 1989, Wellington*
  - *“Inundation Maps – Waikato River – Dam Break Scenarios”, Works Consultancy Services for ECNZ, 1992, Wellington*
  - *Hamilton LiDAR, Data Supply Metadata S1, 2008*
  - *“Soils map of Hamilton City, North Island, New Zealand”, Bruce, 1979. To accompany NZ Soil Survey report 31. Department of Scientific and Industrial Research, Wellington.*
  - *“Land Use Planning for Natural Hazards – Stewardship for the future”, New Zealand Centre for Advanced Engineering, April 2009*
  - *“Communities for Climate Protection Programme – Action Plan”, Hamilton City Council*
  - *“Preparing for climate change – A guide for local government in New Zealand”, Ministry for the Environment, ME.891, July 2008*
  - *“Climate Change Effects and Impacts Assessment: A Guidance Manual for Local Government in New Zealand”, 2nd Edition Ministry for the Environment (2008). Mullan B; Wratt D; Dean S; Hollis M; Allan S; Williams T, Kenny G and Ministry for the Environment, Wellington*
  - *Hamilton City Development Manual (Hamilton City Infrastructure Technical Specifications)*
  - *“Analysis of High Intensity Rainfall for Hamilton City”, NIWA, Feb 2008 - NIWA Client Report WLG2008-010*
  - *3 Waters Modelling Project – Stormwater, AECOM for Hamilton City Council, 29 October 2012*
  - *Flood Hazard Report, AECOM for Hamilton City Council, 29 October 2012*
  - *Summary of “The Effects of Land Use Change Between Taupo and Karapiro on The Flood Hydrology of The Waikato River Catchment”, Technical Report 2009/21, December 2009*
  - *“Meeting the Challenges of Future Flooding in New Zealand”, Ministry for the Environment and the flood Risk Management and River Control Review Steering Group, August 2008*
  - *Central Waikato River Stability Management Strategy 2008-2058, Waikato Regional Council, and its technical documents*
    - *Smart, G.M (2003) “Degradation of the Waikato River, Karapiro to Ngaruawahia, Review of Existing Knowledge & Recommendations for Future Work”*
-

- 
- *Smart, G.M (2005) "Analysis of Stage II Degradation Studies Waikato River, Karapiro to Ngaruawahia"*
  - *Smart, G.M (2005) "Relative Importance of factors causing degradation in the Middle Waikato River Discussion document"*
  - *Beca Infrastructure Ltd (2005) "Middle Waikato Bed Degradation Investigation Stages III & IV. Stage IV: Bed Degradation Management Strategy"*
  - *Beca Infrastructure Ltd (2006) "Middle Waikato Bed Degradation Investigation Stages III & IV. Proposed Middle Waikato River Bed Degradation Management Strategy: Appendices"*
  - *River Stability Hazard Lines: Central Waikato River Stability Management Strategy. October 2006*
  - *URS NZ Ltd. (2007) "Waikato River Erosion Study"*
  - Flood Risk Mitigation Plan, Policy Series 97/13, Waikato Regional Council
  - Earthquake Risk Mitigation Plan, Policy Series 97/12, Waikato Regional Council
  - Volcanic Risk Mitigation Plan, Policy Series 90/10, Waikato Regional Council
  - Water Shortage Risk Management Plan, Policy Series 2000/31, Waikato Regional Council



## Appendix B

### Resource management issues and Council's statutory responsibilities under s32 of the Act

#### Resource Management Issues

##### Current approach

The Operative District Plan identifies areas subject to flooding and geotechnical constraints via an Environmental Protection Overlay (EPO) (with associated rules) and subdivision requirements. This provides for a level of control over subdivision and development within these identified hazard areas. There is specific acknowledgment that significant information gaps exist. Flooding layers exist in relation to culvert blockage areas, river flooding and flooding in Templeview. The balance of the City did not have information available that was suitable to identify areas prone to flooding in storm events.

Outside of the (EPO) area Council relies on provisions of the Building Act to ensure structures are built in a way that ensures they are safe from flooding and land instability identified by the Waikato River bank instability (refer Beca Infrastructure Ltd dated May 2006 "Proposed Middle Waikato River Bed Degradation Management Strategy" prepared for the Waikato Regional Council).

Such reliance on the Building Act 2004 puts Council and the community on the 'back foot' – effectively relying on coarse Building Act "accept" or "decline" decisions to ensure long-term safety. This approach has its limitations. Firstly, within the Building Act there is no provision for an Assessment of Environmental Effects meaning assessments under that legislation must rely heavily on accurate Project Information Memorandum (PIM) information and the experience of Council officers to uncover less obvious secondary effects of building developments. Secondly, the process is blunt – it does not allow Council to tailor a building consent to the receiving environment. Lastly, the Building Act does not allow Council to control subdivision (though the Act itself does via s106) and is the last step in a series of processes that can lead people to genuinely believe land they have purchased or are trying to develop is able to be built on when planning restrictions could have foreshadowed limitations much earlier.

##### Proposed approach

A shift towards a more managed approach to land use in the City with respect to natural hazards may, in the longer-term, be a more sustainable and prudent option.

The proposed plan sets a policy direction based on the type and scale of hazard and the susceptibility of potential land uses.

Flooding and land instability (erosion, land slips and subsidence) are natural hazards of particular concern in Hamilton. This is because of their likelihood and potential impact given the City's landforms, existing land use and future growth expectations. It is these hazards that this chapter focuses on. District Plan rules do not directly address other natural hazards, deferring instead to other statutory instruments or processes (refer to other methods of implementation).

The desired outcome is to ensure future (and potentially more intense) natural hazard events cause the least possible damage to people, land and property. The focus is on

ensuring patterns of land use are sustainable in the long term and that with time communities respond wisely to risk associated with natural hazards.

Hamilton has several specific issues that require addressing. These are:

Opportunities to improve the identification of hazard areas.

- i. New flood hazard modelling show that parts of the City are potentially subject to River, surface or overland flow flooding in a 1%AEP storm event.
- ii. New contour information for the City that allows greater refinement of gully areas

The need for a long-term approach for risk management in Greenfield areas and how to integrate additional land coming within Council's jurisdiction (i.e. Ruakura and Te Rapa North).

Infrastructure and private investment within some identified hazard areas represent a significant resource and abandonment is often not a sustainable option.

Striking the right balance between providing options for the efficient use of land (as a physical resource) and avoiding or mitigating the adverse effects of natural hazards potentially affecting that land and ensuring that people, property and the environment are not subjected to unacceptable levels of risk.

Recognising and responding to changes in the frequency and intensity of storm events as a result of the effects of climate change means that older development(s) which have considered their level of risk may need to re-evaluate in light of new information.

### ***Information***

A key constraint to planning for natural hazards is often the availability of information about the likelihood and extent of natural hazard events. Hazard monitoring, and information gathering, assessment and sharing is necessary to ensure a comprehensive information base is available for hazard planning.

Knowledge of natural hazard risks is an important method to reduce adverse effects on people, property and the environment from natural hazards. By educating and providing sufficient information on hazards people are better equipped to individually plan and prepare for hazard events.

The City's landform was mapped in July and August 2008 using Light Detection and Ranging (LiDAR) aerial photography technology to produce significantly more accurate data, which can be used in hazard modelling and assessment.

Information on Climate Change is continuing to evolve. See ***Climate Change*** below for more discussion.

Modelling is an important tool to understand the potential nature and extent of a natural event when no or incomplete records and information is available about previous occurrences. Council has commissioned flood modelling for the City as a means of understanding and planning for potential flooding during defined storm events. This is discussed below (see ***Flooding***).

### ***Climate Change***

Section 7 of the Resource Management Act requires Council to have particular regard to effects of climate change. There are a number of reports available on climate change and its impacts on people and the environment. There is a general consensus that

climate change is real and will affect almost all of us in some way. The weather patterns in the Waikato can be quite variable. While there is some uncertainty over how climate change could affect Hamilton, indications are that changing weather patterns will lead to:

- i. More frequent and severe rainfall events
- ii. Windier weather
- iii. Drier summers.

Changes in weather patterns have the potential to exacerbate existing natural hazards such as flooding, erosion and land instability. This increase in frequency and severity of natural hazard events must be considered when managing activities in and around areas affected by natural hazards. The emerging realisation that larger flooding events will become more frequent with time forces the consideration of the resilience of our communities and the way we develop – particularly over a longer time frame.

4.1.14a) of the Proposed Regional Policy Statement identifies the District Plan as a means to recognise climate change, stating that particular regard shall be had to minimum increases in temperature of 3<sup>o</sup>C to 2090 (relative to 1990 levels); Council uses levels based on the Hamilton City Development Manual (August 2008) set from a report prepared by NIWA (Analysis of High Intensity Rainfall for Hamilton City, NIWA, Feb 2008). This is lower than that identified in the Proposed Regional Policy Statement but is consistent with Ministry for the Environment Guidelines for taking into account climate change and has been used for stormwater development calculations in the City since 2008.

The flood hazard mapping used in the Proposed District Plan uses a 1%AEP design storm that incorporates climate change assumptions. For details, refer to the following reports.

Waters Modelling Project – Stormwater, AECOM for Hamilton City Council, 29 October 2012.

Flood Hazard Report, AECOM for Hamilton City Council, 29 October 2012.

All subdivision and development involving designing for stormwater infrastructure makes reference to the Hamilton City Technical Specifications as a guide for acceptable means of compliance. This contains calculations based on future changes in climate, albeit for stormwater infrastructure designs for piped and secondary that manage annual return periods from 2, 5, 10 and 50 year periods.

### ***Flooding***

The proposed district planning maps identify five flood hazard areas, against which various policies and rules apply. These five areas are:

- High Flood Hazard Area.
- Medium Flood Hazard Area.
- Low Flood Hazard Area.
- Temple View Flood Hazard Area.
- Culvert Block Flood Hazard Area.

### *Temple View and Culvert Block Flood Hazard Areas*

The Temple View Flood Hazard Area applies to parts of Temple View that are susceptible to flooding. These areas are associated with small-scale farm dams and secondary flow paths that are part of the Waipa Flood Prevention Scheme. The extent of this hazard area comes from the Operative District Plan.

The Culvert Block Flood Hazard Areas apply upstream of significant culverts along the gully system. These represent the maximum effect of a culvert becoming blocked whereby water backs up the gully until it eventually overtops the accessway or transport corridor above the culvert. The extent of this hazard area comes from the Operative District Plan with some updates to reflect changes to the finished levels of roads. Culvert Block Flood Hazard Areas have been removed from those parts of the City within the detailed modelling catchments.

These flood hazard areas will be replaced over time as Council undertakes further detailed flood hazard modelling.

### *Low, Medium and High Flood Hazard Areas*

The Low, Medium and High Flood Hazard Areas have been identified using flood hazard modelling prepared for Hamilton City Council and the Regional Council. The flood hazard modelling covers five areas of the City and the Waikato River corridor. These Flood Hazard Areas show land predicted to be affected by river flooding, water ponding or overland flowpaths in a storm event that has a 1% chance of occurring or being exceeded in any one year (equivalent to a 1 in 100 year event).

The Low, Medium and High categories of Flood Hazard Areas are based on combinations of water depth and speed. Generally, the deeper or faster the water the greater the consequence if people or property are exposed to it (i.e. the greater the risk). This is reflected in the policies and rules that relate to Flood Hazard Areas whereby a more restrictive approach exists within High Flood Hazard Areas compared with the Medium or Low Flood Hazard Area.

Details of assumptions and methodologies used are contained in the following reports.

Waters Modelling Project – Stormwater, AECOM for Hamilton City Council, 29 October 2012.

Flood Hazard Report, AECOM for Hamilton City Council, 29 October 2012.

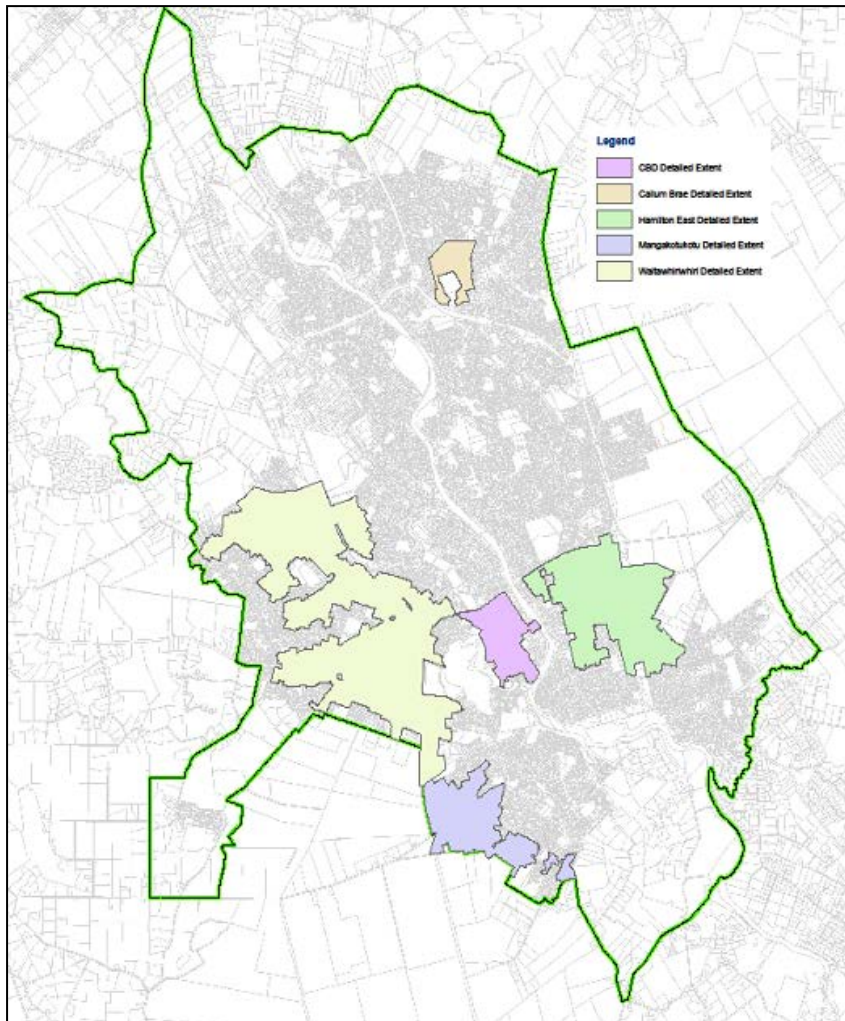
The water and depth components of these flood hazard categories are described in the table below.

<b>Flood Hazard Area</b>	<b>Waikato River flooding</b>	<b>Surface ponding and overland flowpaths (beyond flooding from the Waikato River)</b>
High	<ul style="list-style-type: none"> <li>i. The depth of the flood waters exceeds 1m; but</li> <li>ii. Excludes flood water depths less than 0.1m.</li> </ul>	<ul style="list-style-type: none"> <li>i. The depth of the flood waters exceeds 1m, or</li> <li>ii. The speed of the flood waters exceeds 2m per second, or</li> <li>iii. The flood depth</li> </ul>

		<p>multiplied by the speed exceeds one, but</p> <p>iv. Excludes flood water depths less than 0.1m.</p>
Medium	<p>i. The depth of the flood waters is equal to or less than 1m, but</p> <p>ii. Excludes flood water depths less than 0.1m.</p>	<p>i. The depth of the flood waters is equal to or less than 1m but greater than 0.5m, or</p> <p>ii. The speed of the flood waters is equal to or less than 2m per second but greater than 1m per second, and</p> <p>iii. The flood depth multiplied by the speed is less than or equal to one, but</p> <p>iv. Excludes flood water depths less than 0.1m.</p>
Low	N/A	<p>i. The depth of the flood waters is equal to or less than 0.5m, and</p> <p>ii. The speed of the flood waters is equal to or less than 1m per second, but</p> <p>iii. Excludes flood water depths less than 0.1m</p>

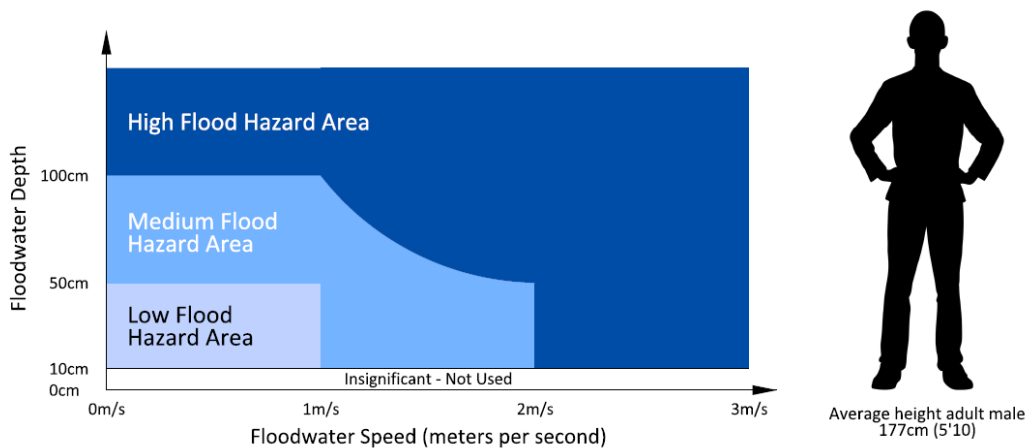
1. *This detailed modelling is sourced from the Waikato Regional Council. The modelling data does not have a velocity component.*
2. *See Figure A below for the catchments where detailed modelling exists for surface and overland flooding.*
3. *See Figure B and Table C below showing the relationship between depth and velocity used in determining flood hazard areas and associated risk.*

**Figure A** showing catchments where detailed modelling exists for surface and overland flooding.

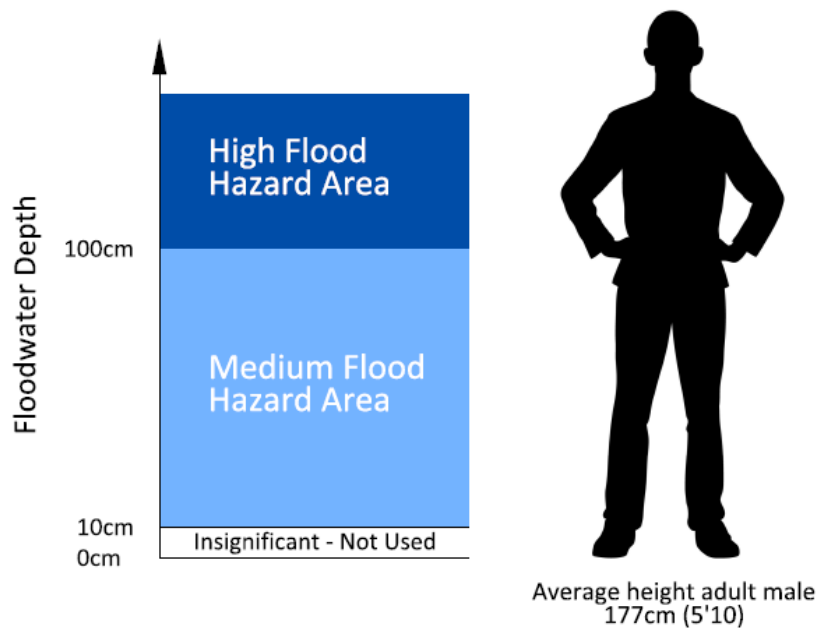


**Figure B** showing the relationship between depth and velocity used in determining flood hazard areas.

*The flood hazard areas for **overland flowpath and ponding** flooding elsewhere in the City are defined by the following depths and velocities.*



Flood hazard areas in the **Waikato River corridor** are defined using the following depths.



**Table C** containing comment on the risks associated with different depths and velocities.

Classification	Depth Criteria	Velocity Criteria	Depth x Velocity Criteria	Comment (Refer AECOM report, 2012)
<b>Insignificant</b>	0-0.1m	Any velocity	N/A	At this depth, surface water is unlikely to be a hazard to people and unlikely to cause damage to property. NZBC E1 specifies 150mm freeboard to floors; therefore, habitable floors should be protected from significant damage.  Also takes into account inaccuracies found in LiDAR and modelling.
<b>Low</b>	0.1 to 0.5m	<1.0m/s	N/A	At this depth and velocity flood hazards are normally traversable by emergency vehicles and damage to property is minor to moderate. Humans can usually stand.  Scour is unlikely to occur.

<b>Medium</b>	0.5 to 1.0m	<2.0m/s	N/A	At this depth and velocity human stability in water is at risk. According to the Federal Emergency Management Agency (1979), a moderate sized person begins to lose stability in 0.91 m (deep water flowing 0.61 m/s).  Damage to property can be financially significant (Auckland Council Flood Damage Analysis).
<b>High</b>	>1.0m	>2.0m/s	>1	At velocities in excess of 2m/s the stability of foundations can be significantly affected by scour (NSW Flood Plain Development Manual).  At depths in excess of 1m significant damage to building and risk to health and safety is very likely.

The High Flood Hazard area corresponds with the Proposed Regional Policy Statement definition of High Flood Risk Areas whereby the depth or the water, its velocity, or a combination of the depth and velocity is such that activities within this area are at a significant risk.

Each flood hazard category has its own set of policies and rules that reflects the degree of risk that the hazard creates with respect to subdivision, use and development.

In addition to the detailed modelling for the Low, Medium and High Flood Hazard Areas Council has mapping from low detailed modelling (Rapid Flood Hazard Assessment) that covers the balance of the City.

The Rapid Flood Hazard Assessment is indicative only. This information is not certain enough to rely upon for District Plan intervention (see Risk of acting below), and does not pass the threshold requiring Council to add this information to any Land Information Memorandum (LIM). Council uses this information as part of prioritising further investigation and modelling and for its own asset management purposes.

It is Council's intention through work programmes established by the "10-Year Plan" (subject to review) to complete detailed modelling for the balance of the developed parts of the City and then update the flood hazard mapping used in the District Plan. Depending on the progress of the proposed District Plan and the programme of modelling this will be undertaken by either a variation to the proposed District Plan or plan change if the District Plan has been made operative.

The risks of acting versus not acting (in relation to Rapid Flood Hazard Assessment information) are understood as follows.

#### **Risks of not acting**

- The vulnerability of use and development to natural hazards is understated.
- The community becomes more vulnerable to the effects of natural hazards.
- Natural hazard guidance with regard to new land use is too general, leading to inconsistent decision making and development uncertainty.



**Risks of acting**

- The vulnerability of use and development to the effects of natural hazards is overstated, leading to unnecessary constraints on the subdivision, use and development of land.
- Relevant consideration also includes the timeframe before detailed modelling becomes available. Completion of detailed modelling and catchment management plans is expected within the life of this Proposed District Plan – a short period in the context of a 100 year planning period.

***Waikato Riverbank and Gully Hazard Area***

The slopes and soil types of the Waikato Riverbank and Gully systems potentially make these areas more susceptible to land instability (erosion, land slips and subsidence). In addition to controls within the Waikato Riverbank and Gully Hazard Area there are setbacks for nearby new development.

The Waikato Riverbank and Gully Hazard Area is an amalgam of the following features.

- Gully slopes.
- Waikato Riverbank stability line.

The Waikato River and its supporting network of gullies run through much of the City. These areas are vulnerable to erosion and land instability which puts activities occurring within these areas at greater risk. The soil types within this hazard area are also more prone earthquake effects, including liquefaction.

The gully slopes and soils components and approach of the Environmental Protection Overlay in the Operative District Plan form the basis of this hazard area (refer to Natural Values s32 for the Proposed District Plan, October 1999). Key changes are:

- New parts of the City have been added.
- Waikato Riverbank stability line included.
- The extent of the gully slope (<25 degrees, >25degrees) and soil layer (Kirikiriroa complex soils) has been modified using new contour and aerial photography information. This has improved accuracy as reliance on soil layer information is not as appropriate at smaller scales.

***Waikato Riverbank Stability Line***

The Waikato River bank stability line has been incorporated into the proposed district plan as a hazard area.

The Central Waikato River Stability Management Strategy 2008-2058 was developed to provide a coordinated strategy for managing the stability of the Waikato River between Karapiro and Ngaruawahia. It was developed collaboratively between Council, Waikato District Council, Waipa District Council, Waikato Tainui, Mighty River Power and the Waikato Regional Council, and concentrates particularly on the potential effects of river bed erosion and river bank instability. One part of the project involved the identification of areas adjacent to the Waikato River which are potentially subject to erosion hazard over the next 50 years. This included recommended setback lines from the Waikato River which may be more prone to instability (refer to technical reports supporting the Central Waikato River Stability Management Strategy 2008-2058) .

Hamilton City Council has an obligation under the Local Government Official Information and Meetings Act to bring the new hazard information to the attention of affected property owners. The Council wrote to those people who have properties next to the river explaining the management strategy and any implications for their property. Council is required to put this information on relevant property files and this information will be available for people who apply for a LIM from Council, prior to purchasing a property.

Owners of properties within these setbacks are required to obtain specialist engineering advice prior to undertaking work on their site.

Further refinement of the Waikato Riverbank stability line has been considered previously, as part of investigations for the Rototuna Structure Plan (Variation 12 to the then Proposed District Plan in 2010). This concluded that this information was sufficient to use for the management of hazard risk. This recognised the cost of further refinement of these lines which would require a walkover of the river bank and adjacent land and review available subsurface investigation data. An indicative cost of \$15,000 per 400m stretch was identified.

### Statutory Responsibilities

Council is required under section 32 of the Resource Management Act 1991 (the RMA) to carry out an evaluation of alternatives, costs and benefits, and efficiency and effectiveness of the various components of the proposed district plan.

Section 32(3) of the Act requires that the evaluation must examine:

- a) The extent to which each objective is the most appropriate way to achieve the purpose of the Act; and
- b) Whether, having regard to their efficiency and effectiveness, the policies, rules or other methods are the most appropriate for achieving the objectives.

An evaluation must also take into account (Section 32(4)):

- a) The benefits and costs of policies, rules, or other methods; and
- b) The risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the policies, rules or other methods.

“Natural Hazard Management – Research Report”, Tonkin and Taylor Ltd for the Ministry for the Environment, August 2006, contains a comprehensive list of the planning and legal framework for natural hazard management (Part 8, p55-91). Some legislative change has occurred since this report (e.g. changes to the Local Government Act in 2010) was completed but the substantive part remains relevant.

#### i) **Resource Management Act 1991**

There is a statutory mandate and good guidance on the treatment of Natural Hazards in the planning process. In particular section 74 of the Resource Management Act requires that the Council, when considering a change to a Plan, be in accordance with the provisions of Part II of the Act, its functions under Section 31, and its duties under Section 32, and Section 75.

Part II of the Act outlines the purpose and principles of Resource Management in New Zealand. Section 5 of Part II states that the Act’s purpose is to *promote the sustainable management of natural and physical resources* meaning *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 social, economic, and cultural wellbeing and for their health and safety while:*

- (a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
- (b) Safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*
- (c) Avoiding, remedying, or mitigating any adverse effects of activities on the environment.*

In terms of natural hazards this directive seeks to limit development to the level that the land can cope and where choice exists, avoiding problems that might occur. In as these are questions of law, they are also questions communities need to consider and resolve for themselves.

*Section 7 of the Act lists “other matters” that local authorities must have particular regard to which includes:*

- (b) The efficient use and development of natural and physical resources.*
- (g) Any finite characteristics of natural and physical resources.*
- (i) The effects of climate change.*

Section 8 of the Act requires the principles of the Treaty of Waitangi to be taken into account.

Council’s primary mandate for being involved in land use planning around natural hazards arises from Section 31 of the Act which describes Council’s responsibilities and tasks including:

- (a) The establishment, implementation, and review of objectives, policies and methods to achieve the integrated management of the effects of the use development, or protection of land and associated natural and physical resources of the district.*
- (b) The control of any actual or potential effects of the use, development or protection of land, including for the purpose of-*
  - (i) The avoidance or mitigation of natural hazards; ....*

Section 73 of the Act requires each territorial authority to prepare a District Plan. The District Plan is the primary tool to ensure that the subdivision, development and use of land is managed to achieve the purpose of the Act.

Section 72 states that the purpose of the Plan is “to assist territorial authorities to carry out their functions in order to achieve the purpose of this Act”: Section 75(2) states that a District Plan must give effect to :

<i>(a) any national policy statement; and</i>	There are no national policy statements for managing natural hazards.
<i>(b) any New Zealand coastal policy statement; and</i>	The New Zealand Coastal Policy Statement is relevant to natural hazards, but not in the Hamilton context.

<i>(c) any regional policy statement.</i>	The Waikato Regional Policy Statement (Operative 2000) is relevant in this regard.
-------------------------------------------	------------------------------------------------------------------------------------

Under Section 75(4) a District Plan must not be inconsistent with:

<i>(b) a regional plan for any matter specified in section 30(1).</i>	The Waikato Regional Plan (Operative 2007) is relevant in this regard
-----------------------------------------------------------------------	-----------------------------------------------------------------------

Section 74 states the matters to be considered by a territorial authority. In addition to the requirements of section 75(3) and (4), when preparing a District Plan, a territorial authority shall have regard to:

<i>(2)(a) any— (i) proposed regional policy statement; or</i>	The Proposed Waikato Regional Policy Statement (2010) is relevant in this regard
<i>(ii) proposed regional plan of its region in regard to any matter of regional significance or for which the regional council has primary responsibility under Part 4; and</i>	There are no proposed regional plans. Variations No.2 (Geothermal module), No. 5 (Lake Taupo catchment) and No. 7 (Geothermal Maps and minor changes) to the operative regional plan are not relevant in this context.
<i>(b) any— (i) management plans and strategies prepared under other Acts; and ...</i>	Relevant management plans and strategies include: <ul style="list-style-type: none"> <li>• Waikato Civil Defence Emergency Management Plan</li> <li>• Central Waikato River Stability Management Strategy 2008-2058</li> <li>• Waikato Region: <ul style="list-style-type: none"> <li>• Flood Risk Mitigation Plan</li> <li>• Earthquake Risk Mitigation Plan</li> <li>• Volcanic Risk Mitigation Plan</li> <li>• Water Shortage Risk Management Plan</li> </ul> </li> </ul>
<i>(c) the extent to which the district plan needs to be consistent with the plans or proposed plans of adjacent territorial authorities. ...</i>	The Waikato District Plan (Operative in part – 2010, proposed parts, and variations) and Waipa District Plan (Operative 1997) are relevant in this regard. The Franklin District Plan (Operative 2000, and plan changes and variations) which covers parts of the former Franklin District Council which became part of Waikato District Council's jurisdiction on 1 November 2010 is also relevant.

Council is required by Section 106, of the Act, to have particular regard to natural hazards in relation to the subdivision of land, which states:

*(1) Despite section 77B, a consent authority may refuse to grant a subdivision consent, or may grant a subdivision consent subject to conditions if it considers that-*

- (a) *The land in respect of which a consent is sought, or any structure on the land, is or is likely to be subject to material damage by erosion, falling debris, subsidence, slippage or inundation from any source; or*
- (b) *Any subsequent use that is likely to be made of the land 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; or*
- (c) ...
- (2) *Conditions under subsection (1) must be –*
  - (a) *For the purposes of avoiding, remedying, or mitigating the effects referred to in subsection (1); and*
  - (b) *Of a type that could be imposed under section 108.*

When processing subdivisions this allows territorial authorities to act on information that may not have been recognised within the District Plan. Often there is a lag between information becoming available and District Plans being changed to reflect this information. This section of the Act, the Building Act 2004 and the Local Government Official Information and Meetings Act (in relation to Land and Project Information Memoranda) can assist.

**ii) The Waikato Regional Policy Statement (October 2000)**

The Regional Policy Statement was made operative in October 2000.

Territorial authorities are required to give effect to an operative RPS under section 75(2)(c) .

Refer to Appendix C for key Objectives, Policies and Methods of the Regional Policy Statement that relate to the development of the Natural Hazards Chapter for the Proposed District Plan.

**iii) The proposed Regional Policy Statement (November 2010)**

The proposed Regional Policy Statement (RPS) was notified on 3 November 2010. Hearings were held in 2012.

Territorial authorities are required to have regard to a proposed RPS under section 74(2)(a)(i) of the Act.

Refer to Appendix D for key Objectives, Policies and Methods of the Proposed Regional Policy Statement that relate to the development of the Natural Hazards Chapter for the Proposed District Plan.

Regard has been had to provisions in the proposed Regional Policy Statement in developing Objectives, Policies and Rules with respect to Natural Hazard issues.

**iv) Waikato Regional Plan**

The Waikato Regional Plan was made operative in part on 28 September 2007.

Under section 75(4)(b) of the Act a District Plan must not be inconsistent with a regional plan for any matter specified in section 30(1).

Relevant provisions have been taken into account in developing Objectives, Policies and Rules with respect to Natural Hazards to ensure that they are not inconsistent with the Waikato Regional Plan.

**v) The Waikato (and Franklin) and Waipa District Plans**

The Waikato District Plan was made operative in part on 28 June 2011. On 1 November 2010 the boundaries of the Waikato District were amended to incorporate part of Franklin District; the Franklin District Plan (operative 29 February 2000) applies to that part of former Franklin District. The Waipa District Plan was made operative in 1997 and is currently being reviewed; however a proposed district plan has not yet been notified.

Territorial authorities are required to have regard to the extent to which the consistency with the Operative and Proposed District Plans of neighbouring territorial authorities is needed under section 74(2)(c) of the Act.

In developing objectives, policies and rules for the Proposed Plan, regard has been had to the extent to which they are consistent with relevant provisions of the District Plans of neighbouring territorial authorities.

**vi) Local Government Act (LGA), 2002**

This provides the general framework, obligations, restrictions and powers under which local authorities operate. Key sections of the LGA are s10, s14, s93-97 and s163. The Local Government Amendment Act 2010 encouraged Councils to focus on core services as part of ensuring that Council activities and decisions match the priorities of the community. It added s11A to the principal Act which identifies the avoidance or mitigation of natural hazards as a core service a local authority must have particular regard to in performing its role.

**vii) City Strategy – Hamilton Urban Growth Strategy (HUGS), April 2010 and Future Proof Strategy (July 2009)**

The Hamilton Urban Growth Strategy (HUGS) is a long term strategic growth planning tool focused on delivering integrated and sustainable growth in Hamilton City. It was reviewed by Council in 2010 and is consistent with Future Proof.

The sub-regional growth strategy (Future Proof):

Recognises natural hazards as a constraint for managing growth (4.5), the growth options include evaluation criteria (5.2.5) regarding the avoidance of areas subject to high levels of natural hazard risk.

Defines issues, key approaches and actions (8.13) for responding to natural hazard risk.

**viii) Civil Defence and Emergency Management Act 2002 (CDEMA)**

This provides for the comprehensive management of hazards and risks, and emergency response and recovery, through co-ordinated and integrated policy, planning and decision making processes at the national and local level. It sets out the duties, functions and powers of central government, emergency services, lifeline utilities and the general public.

The underlying philosophy of the CDEMA is the “4 R’s” (Reduction, Readiness, Response and Recovery) to mitigate or avoid the impacts of hazards.

**ix) Building Act 2004**

This provides for the regulation of building work, the licensing regime for building practitioners, and the setting of performance standards for buildings. It manages natural hazards in relation to the construction and modification of buildings.

Section 37 of the Building Act allows local authorities to delay building work until a resource consent is gained. This provision can be used where development is taking place on hazard-prone land and plan rules require a resource consent.

Sections 71 to 74 of the Building Act relate to building consent limitations and restrictions for the construction of buildings on land subject to natural hazards.

Section 71 requires a building consent authority (such as the council) to refuse to grant a building consent for construction of a building, or for major alterations to a building if the land on which the building work is to be carried out is subject or is likely to be subject to one or more natural hazards, or the building work is likely to accelerate, worsen, or result in a natural hazard on that land or any other property. However, s71 provides an exception that allows the building consent to be granted if adequate provision has been made to protect the land or building work, or to restore any damage to the land or other property as a result of the building work.

Building on land subject to natural hazards

- (1) A building consent authority must refuse to grant a building consent for construction of a building, or major alterations to a building, if—*
  - (a) the land on which the building work is to be carried out is subject or is likely to be subject to 1 or more natural hazards; or*
  - (b) the building work is likely to accelerate, worsen, or result in a natural hazard on that land or any other property.*
- (2) Subsection (1) does not apply if the building consent authority is satisfied that adequate provision has been or will be made to—*
  - (a) protect the land, building work, or other property referred to in that subsection from the natural hazard or hazards; or*
  - (b) restore any damage to that land or other property as a result of the building work.*
- (3) In this section and sections 72 to 74, natural hazard means any of the following:*
  - (a) erosion (including coastal erosion, bank erosion, and sheet erosion):*
  - (b) falling debris (including soil, rock, snow, and ice):*
  - (c) subsidence:*
  - (d) inundation (including flooding, overland flow, storm surge, tidal effects, and ponding):*
  - (e) slippage.*

Factors which could cause such acceleration or worsening of the hazards include, for example: site development work (filling, levelling, and excavation), vegetation removal, and stormwater run-off. However, a consent can be issued for a building work to proceed if the territorial authority is satisfied that one or more of the three exceptions apply. These exceptions are (s72):

*Despite section 71, a building consent authority that is a territorial authority must grant a building consent if the building consent authority considers that—*

*(a) the building work to which an application for a building consent relates will not accelerate, worsen, or result in a natural hazard on the land on which the building work is to be carried out or any other property; and*

*(b) the land is subject or is likely to be subject to 1 or more natural hazards; and*

*(c) it is reasonable to grant a waiver or modification of the building code in respect of the natural hazard concerned*

Section 73 provides for the insertion of a notification condition (on the title for the property) within any consent granted under s72. These conditions can relate to structural requirements for flood, wind, fire, earthquake and volcanic hazards.

Section 74 provides that where a building consent has been granted for land subject to a natural hazard, that the building consent authority must notify the Surveyor-General, the Registrar of the Māori Land Court or the Registrar-General of Land. The District Land Registrar will then include an entry on the certificate of title to the land (ie, a covenant) that building consent has been issued in respect of building on land which is subject to erosion, avulsion, alluviation, falling debris, subsidence, inundation or slippage.

**x) The Building Code**

The Building Code is a regulation that accompanies the Building Act 2004, and outlines the performance expectations for buildings. One method of demonstrating compliance with the Building Code is the AS/NZ 1170 Structural Design Actions standard. The standard includes loading requirements for soil, wind, earthquake, ice, and snow. The standard does not include loading requirements for land movement, volcanic activity or tsunamis.

The AS/NZ 1170 and the New Zealand Building Code is currently under review by the Department of Building and Housing.

The Building Act 2004 also covers dam construction and dam safety management for large dams. This was introduced to ensure that dams are well built, that larger dams are regularly monitored, and that the potential risks to people and property are minimised. See more information on the Building Act 2004 and dam safety.

**xi) Project Information Memoranda**

Section 32 of the Building Act provides that a property owner contemplating building work can apply to the Council for a project information memorandum (PIM) before application for a building consent. One must be supplied with an application for building consent if it has not been done so previously.

Section 35 sets out the information required to be provided through the PIM, including:

*Content of project information memorandum*

*(1) A project information memorandum must include—*

*(a) information likely to be relevant to the proposed building work that identifies—*

*(i) the heritage status of the building (if any); and*

*(ii) each special feature of the land concerned (if any).*

*In this section,—*



**land concerned—**

*(a) means the land on which the proposed building work is to be carried out; and*

*(b) includes any other land likely to affect or be affected by the building work*

**special feature of the land concerned** includes, without limitation, potential natural hazards, or the likely presence of hazardous contaminants, that—

*(a) is likely to be relevant to the design and construction or alteration of the building or proposed building; and*

*(b) is known to the territorial authority; and*

*(c) is not apparent from the district plan under the Resource Management Act 1991.*

**xii) Environment Act 1986**

This sets out the functions of the Parliamentary Commissioner for the Environment (s16) and Ministry for the Environment (s31), including obligations in the management of natural hazards (see s17, s32).

**xiii) Soil Conservation and Rivers Control Act 1941**

Makes provision for the conservation of soil resources, the prevention of damage by erosion and to make better provision for the protection of property from damage by floods.

**xiv) Land Drainage Act 1908**

Establishes drainage districts and boards and powers of local authorities relating to watercourses and drains.

**xv) Forest and Rural Fires Act 1977**

Provides for the safeguarding of life and property related to fires in forests and rural areas.

**xvi) Earthquake Commission Act 1993**

Makes provision with respect to the insurance of residential property against damage caused by specific types of natural hazards.

---

## Appendix C

### Waikato Regional Policy Statement (Operative 2000) relevant Objectives, Policies and Methods

#### 2 Resource Management Processes

##### 2.2 Integrated Management

##### 2.2.2 Achieving Integrated Management

###### Issue

Ad hoc decision making has the potential to prevent integrated management of natural and physical resources.

###### Objective

The integrated management of natural and physical resources in the Waikato Region achieved.

###### Policy One: Natural and Physical Resources

When managing the use, development and protection of natural and physical resources recognise and provide for:

- a) the interconnected nature of all elements of the environment
- b) the inter-relationships between natural and physical resources
- c) the potential for adverse environmental effects to occur
- d) the range of social, cultural and economic values within the Region.

###### Implementation Methods

1. Ensure that regional plans and consent decisions recognise and provide for the matters listed in Policy One above.
2. Encourage territorial authorities in the Region, when they are preparing district plans and processing resource consents, to give consideration to the matters listed in Policy One above.
3. Liaise with resource management agencies and major resource users to advocate consideration of the matters listed in Policy One in their resource management decisions.
4. Raise awareness of the matters listed in Policy One through education programmes and the provision of relevant information.

###### Policy Two: Inter-Agency Integration and Cross Boundary Processes

Ensure inter-agency integration and consideration of cross-boundary processes in the management of natural and physical resources.

###### Implementation Methods

1. Encourage other resource management agencies to make provision, for the significant resource management issues stated in both this document and in any regional plans.
2. Encourage, when new significant resource management issues arise, consultation amongst affected resource management agencies with the view to developing appropriate joint actions to address these issues.
3. Prepare submissions on documents from other agencies, where there are implications for the resource management responsibilities of the Waikato

Regional Council (Environment Waikato) and where there are inconsistencies with the RPS and regional plans.

4. Consult with neighbouring regional councils over the preparation of regional plans, regional rules and other methods to ensure a reasonable consistency in the management of natural and physical resources.
5. Advocate a collaborative approach to managing consent applications, and establish protocols for the effective operation of joint hearings where the request for resource use/development is of significance to both Environment Waikato and a territorial authority(s).
6. Advocate a collaborative approach to managing consent applications where the application for resource use/development crosses regional boundaries and/or has implications for neighbouring authorities.
7. Facilitate forums and other means of communication which allow for the sharing of information between resource management agencies and/or the formulation of co-ordinated policy.
8. Encourage joint resource management projects with territorial authorities, neighbouring Regional Councils, iwi authorities and other resource management agencies where there are clear benefits to all parties.
9. Consider the transfer of powers or the delegations of functions to public authorities where appropriate.

Resource management issues that are likely to invoke Policy Two above and the accompanying methods are as follows.

- a) Any matter which may impact on the functions and responsibilities of Environment Waikato.
- b) The actual or potential effects of the use, development or protection of land of regional significance. This includes:
  - i) Land matters that could adversely affect natural and physical resources which are the responsibility of Environment Waikato.
  - ii) Land matters as outlined in sections 6 and 7 of the Act (Matters of National Importance and Other Matters) where a regional perspective would be beneficial.
- c) Consent applications with significant implications for both Environment Waikato and territorial authorities and/or neighbouring regional/territorial authorities, or where resource use, development or protection cannot be considered in isolation to neighbouring regional/territorial authorities.

### **3 Significant Resource Management Issues, Objectives, Policies and Methods**

#### **3.3 Land and Soil**

##### **3.3.7 Accelerated Erosion**

#### **3.8 Natural Hazards**

##### **3.8.3 Management of Natural Hazards**

###### **Issue**

The roles and responsibilities of local authorities and other agencies for the management of natural hazards in the Waikato Region have not been agreed or clearly identified. Until this is done, inefficiencies and/or a duplication of functions may occur.

###### **Objective**

The roles of all relevant agencies for the management of natural hazards in the Waikato Region clearly identified and their responsibilities consistently implemented.

### **Policy One: Consistent Management of Natural Hazards**

Ensure that natural hazards are managed in a consistent manner throughout the Waikato region and roles and responsibilities of agencies are defined.

#### **Implementation Methods**

2. Territorial authorities will:
  - i. develop specific objectives, policies, rules and/or other methods in district plans that control the use of land (except for in the beds of lakes and rivers and the coastal marine area) for the avoidance or mitigation of natural hazards
  - ii. deliver environmental education programmes on local natural hazards to their communities
  - iii. implement relevant hazard specific mitigation plans through building consents and other regulatory and non-regulatory methods
  - iv. provide information on the presence of natural hazards at specific sites through land information memoranda and project information memoranda where such information is known by the territorial authority
  - v. work in partnership with the Waikato Regional Council (Environment Waikato) and their communities to ensure efficient and effective response and recovery to natural hazard events including planning for emergencies.

#### **3.8.4 Adverse Effects**

##### **Issue**

A lack of public awareness of the causes and potential effects of natural hazard events increases the likelihood of adverse effects when these events occur.

##### **Objective**

The adverse effects associated with natural hazards minimised, the resilience of the community and public awareness of the causes and potential effects of natural hazard events increased.

#### **Policy One: Adverse Effects of Natural Hazard Events Avoided and Mitigated**

Ensure the occurrence of natural hazard events are prevented or the associated adverse effects are avoided or mitigated.

#### **Implementation Methods**

1. Through regional plans, district plans, civil defence plans and hazard specific mitigation plans, identify (among other factors) areas of risk and natural hazard management options.
2. Liaise with operators of major dams to ensure integrated management of flood storage within hydro lakes.
3. Establish, maintain and improve the Region's hazard warning system.
4. Advocate through environmental education and regional plans the revegetation of severely eroded areas.
5. Maintain the existing flood control, land drainage and catchment schemes.

#### **Policy Two: New Settlements and Structures**

Ensure new subdivisions and developments are built in a manner designed to avoid or mitigate the adverse effects of natural hazards.

**Implementation Methods**

1. Encourage and assist territorial authorities to compile natural hazards registers.
2. Through regional plans, district plans and resource consents ensure that land uses avoid or mitigate the effects of natural hazards.

**Policy Three: Public Awareness**

Raise public awareness of the causes and effects of natural hazard events (and the means by which their effects can be avoided or mitigated) and ensure that the community are prepared for civil defence emergencies.

**Implementation Methods**

- 1 Use environmental education to:
  - i. Raise the level of community awareness of the risks associated with natural hazard events.
  - ii. Advocate the adoption of land use practices that avoid or mitigate the adverse effects of natural hazard events.
  - iii. Encourage the community to prepare for natural hazard/civil defence emergencies.

## Appendix D

### Waikato Regional Policy Statement (Proposed 2010) relevant Objectives, Policies and Methods

#### 3 Objectives

##### 3.23 Natural Hazards

The risk to people, property and the environment from natural hazards is reduced.

#### Integrated Management

##### Policy 4.1 Integrated Approach

An integrated approach to resource management will be adopted that:

- a. recognises the inter-connected nature of natural and physical resources (including spatially and temporally)
- b. recognises the multiple values of natural and physical resources including ecosystem services
- c. responds to the nature and values of the resource and the diversity of effects (including cumulative effects) that can occur
- d. seeks to maximise benefits by considering opportunities to align interventions (including regulatory and non-regulatory) and/or to achieve multiple objectives
- e. takes a long-term strategic approach which recognises the changing environment and changing resource use pressures and trends
- f. applies consistent and best practice standards and processes to decision making

#### Implementation Methods

##### 4.1.9 Planning Approach

Regional and district plans shall:

- a. ensure that cumulative adverse effects are managed within appropriate limits
- b. recognise the long timeframes at which natural physical processes operate and adopt a 100-year planning timeframe to allow for expected changes in these processes; and
- c. adopt a precautionary approach towards any proposed activity whose effects are as yet unknown or little understood.

##### 4.1.14 Incorporating Effects of Climate Change

Local authorities should, and regional and district plans shall, recognise and provide for the predicted effects of climate change, having particular regard to:

- a. predicted increase in rainfall intensity, taking account of the most recent national guidance and assuming a minimum increase in temperature of 3°C by 2090 (relative to 1990 levels); and
- b. predicted increase in sea level, taking into account the most recent national guidance and assuming a minimum increase in sea level of 0.8m by 2090 (relative to 1990 levels).

**Policy 4.2 Collaborative Approach**

Waikato Regional Council will encourage collaboration, participation and information sharing between resource management agencies, tangata whenua and relevant stakeholders, particularly where there are shared or overlapping responsibilities or functions for issues or resources, and including when resources or issues cross boundaries.

**Implementation Methods****4.2.2 Recognition of Interests**

Local authorities should:

- a. ensure appropriate processes and opportunities are established and maintained to inform relevant agencies, including neighbouring local authorities, relevant infrastructure providers and tangata whenua of any anticipated regional or district plan changes or reviews, growth strategies, structure plans, and land use or subdivision consent processes which may have an effect on the interests of these parties; and
- b. provide opportunities for meaningful involvement in such processes.

**4.2.3 Consistent Information Systems**

Local authorities should:

- a. ensure that, as far as practicable, information is collected, analysed and stored using methods and technologies that are consistent and compatible to enable easy sharing of such information
- b. develop protocols as to how and when information will be shared; and
- c. consider developing shared information services.

**4.2.11 Natural Hazards**

For the purposes of avoiding or mitigating natural hazards, territorial authorities shall be responsible for the control of the use of land except for the following, which shall be the responsibility of the Waikato Regional Council:

- a. the control of the use of land in the coastal marine area and the beds of lakes and rivers; and
- b. the control of structures in primary hazard zones.

**4.2.12 Transfer of Functions**

Waikato Regional Council will investigate transferring its functions for the control of structures in primary hazard zones for the purposes of avoiding or mitigating natural hazards to the relevant territorial authority.

**6 Built Environment****Policy 6.1 Planned and Co-ordinated Development**

Development of the built environment, including transport and other infrastructure, occurs in a planned and co-ordinated manner which:

- a. is guided by the principles in section 6A
- b. recognises and addresses potential cumulative effects of development; and

- c. is based on sufficient information to allow assessment of the potential long-term effects of development.

### **Implementation Methods**

#### **6.1.1 District plans and development planning mechanisms**

Territorial authorities shall have particular regard to the principles in section 6A when preparing, reviewing or changing district plans and development planning mechanisms such as structure plans, town plans and growth strategies.

#### **6.1.3 Development Manuals and Design Codes**

Territorial authorities should, as appropriate, ensure development manuals and design codes allow and encourage development which is consistent with the principles in section 6A.

#### **6.1.5 Growth Strategies**

In areas where significant growth is occurring or anticipated, territorial authorities should develop and maintain growth strategies which identify a spatial pattern of land use for at least a 30-year period. The use of integrated spatial planning tools, such as the Waikato Integrated Scenarios Explorer, should be considered to explore future development options and to integrate land use planning with infrastructure.

#### **6.1.6 Urban Development Planning**

Territorial authorities should ensure that before land is rezoned for urban development, urban development planning mechanisms such as structure plans and town plans are produced, which facilitate proactive decisions about the future location of urban development and allow the information in Implementation Method 6.1.7 to be considered.

#### **6.1.7 Information to Support New Urban Development**

District plan zoning for new urban development (and redevelopment where applicable), and subdivision and consent decisions for urban development, shall be supported by information which identifies, as appropriate to the scale and potential effects of development, the following:

...

- e. potential natural hazards and how the related risks will be managed;

#### **6.1.8 Subdivision and Consent Decisions for Urban Development**

District plans shall ensure that where subdivision and consent decisions allowing urban development are to be made in the absence of development planning mechanisms such as structure plans and town plans, the matters in Method 6.1.7 will be given due consideration, as appropriate to the scale and potential effects of the development.

### **6A Development Principles**

#### **General Development Principles**

New development should:

...

- c. not compromise the safe, efficient and effective operation and use of existing infrastructure, including transport infrastructure, and should allow for future infrastructure needs, including maintenance and upgrading, where these can be anticipated;



- ...
- e. be directed away from identified significant mineral resources and their access routes, natural hazard areas, energy transmission corridors, locations identified as likely renewable energy generation sites, and high class soils;
- ...
- j. avoid as far as practicable adverse effects on natural hydrological characteristics and processes (including aquifer recharge and flooding patterns), soil stability, water quality and aquatic ecosystems, including through low impact design methods where appropriate;
- ...
- m. be appropriate with respect to expected effects of climate change and be designed to allow adaptation to these changes;
- ...

### **13 Natural Hazards**

#### **Policy 13.1 Natural Hazard Risk Management Approach**

Natural hazard risks are managed using an integrated and holistic approach that:

- a. enhances community resilience
- b. is aligned with civil defence approaches
- c. prefers the use of natural features over man-made structures as defences against natural hazards
- d. recognises natural systems and takes a 'whole of system' approach; and
- e. seeks to use the best available information/best practice.

#### **Implementation Methods**

##### **13.1.3 Risk Management Framework**

Regional and district plans shall incorporate a risk-based approach into the management of subdivision, use and development in relation to natural hazards. This should be in accordance with relevant standards, strategies and plans, including:

- a. NZS9401:2008 (Flood Risk Management – A Process Standard)
- b. the Waikato Civil Defence and Emergency Management Group Plan; and
- c. ISO 31000: 2009 (Risk Management).

#### **Policy 13.2 Manage Activities to Reduce the Risks from Natural Hazards**

Subdivision, use and development are managed to reduce the risks from natural hazards, including by:

- a. reducing the risks associated with existing use and development
- b. seeking to avoid new use or development in areas subject to natural hazards
- c. ensuring risk is assessed for proposed activities on land subject to natural hazards
- d. minimising any increase in vulnerability due to residual risk; and
- e. avoiding the need or demand for new structural protection works.

---

**Implementation Methods****13.2.2 Control of Subdivision Within Extreme Risk Areas**

District plans shall control subdivision to avoid creating demand for new structures within high risk flood zones and primary hazard zones.

**13.2.4 Control of Development Within a Floodplain (1% annual exceedance probability)**

Outside of high risk flood zones, regional and district plans shall ensure that subdivision, use and development only occurs in a 1% annual exceedance probability floodplain when it is essential infrastructure and either cannot be located elsewhere or will not increase the risk of or from the natural hazard; or:

- a. appropriate assessment of the risks and likely effects of subdivision, use and development have been undertaken;
- b. any adverse effects of a 1% annual exceedance probability flood event on habitable buildings are avoided or mitigated;
- c. any new structure or reclamation will not divert overland flows, increase runoff volumes or otherwise create a new or exacerbate an existing flood hazard, including off site; and
- d. any hazardous substance stored as part of the development, or during the construction, will not create a hazard.

**13.2.5 Control of Use and Development (high risk flood zones)**

Regional and district plans shall ensure that use and development within high risk flood zones is appropriate, including by:

- a. avoiding the placement of structures or development where these would be particularly vulnerable to a natural hazard event or would place a community at risk, including:
  - i. habitable structures
  - ii. significant community infrastructure such as hospitals and emergency services; and
  - iii. lifeline utilities; and
- b. giving priority to the use of non-structural solutions over the construction of new protection works or structures.

**13.2.6 Control of Subdivision, Use and Development (residual risk zones)**

District plans shall identify residual risk zones and shall control subdivision, use and development within these zones so that residual risk is minimised. In doing so, particular regard shall be had to:

- a. the level of service provided by the structural defences
- b. the physical, environmental and financial sustainability of the structural defences over a period of at least 100 years
- c. the impact caused by an overwhelming or structural failure of protection works; and
- d. a reduction in the ability of a community to respond to and recover from a natural hazard event.

### 13.2.7 Other Natural Hazards

Regional and district plans shall control subdivision, use and development outside primary hazard zones, high risk flood zones and residual risk zones to ensure:

- a. they do not create or exacerbate natural hazard risks elsewhere; and
- b. they are appropriate by considering:
  - i. the likelihood that defensive structures or works will be required to protect the activity from the effects of natural hazards;
  - ii. the vulnerability of the activity to the effects of natural hazards;
  - iii. the potential for adverse effects on the wider local and/or regional community; and
  - iv. whether or not the development is consistent with a growth strategy or structure plan.

### Policy 13.3 High Impact, Low Probability Natural Hazard Events

The risks associated with high impact, low probability natural hazard events such as tsunami, volcanic eruptions, earthquakes and debris flows are considered, having particular regard to:

- a. personal health and safety;
- b. damage and/or disruption to essential community services;
- c. the ability of a community to respond and recover; and
- d. civil defence readiness, response and recovery planning.

### Implementation Methods

#### 13.3.1 Planning for Readiness, Response and Recovery

Local authorities should consider the potential effects of high impact, low probability natural hazard events and addressing these, including by:

- a. where possible avoiding new development in high risk hazard areas (for example, tsunami run-up areas). Development that may be directed away from such areas could include:
  - i. residential, commercial and industrial uses (especially those involving hazardous materials)
  - ii. lifeline utilities; and
  - iii. emergency services facilities including police, hospital and fire services;
- b. using other land use planning measures where it is not feasible to restrict land uses to open-space uses. These may include controlling the type of development and uses allowed in hazard areas, and avoiding high value and high occupancy uses to the greatest degree possible
- ...
- e. liaising with civil defence and lifeline utility agencies; and
- f. designing safeguards for critical community networks (for example, water supply).

## Appendix E

### Potential District Plan Approaches and Tools

Approach	Adaptation Action	Application
Avoid	Prevent development occurring in the wrong place (areas at risk) in the first instance.	Urban areas or future urban areas yet to be developed, subject to inundation, extreme weather (storm) events flooding due to increased rainfall, extreme rainfall events.
Mitigate (limit)	Prevent further development occurring in the wrong place (areas at risk) – restrict further subdivision, infill/intensification, extensions to existing development.	Existing urban areas subject to inundation, extreme weather (storm) events flooding due to increased rainfall, extreme rainfall events.
Mitigate (design)	Use of standards and design requirements to mitigate the risk to activities.	Suitable where there is a high level of confidence that the risk can be mitigated through such requirements as setbacks, site and building layout and orientation, water efficiencies, floor levels etc. to mitigate risks.  Applicable for most climate change elements except extreme events.
Mitigate (offset)	Enabling protection works to stop erosion or prevent inundation.	Suitable where there is a very high level of confidence that the risk can be controlled through protection works in areas subject to inundation, extreme weather (storm) events flooding due to increased rainfall, extreme rainfall events.
Remedy	Managed retreat – a strategic decision to retreat in the face of the hazard and involves withdrawing, relocating or abandoning land/assets at risk.	In areas subject to inundation, extreme weather (storm) events, flooding due to increased rainfall, extreme rainfall events where there is a high level of probability that hazard will overwhelm the property and assets.

There are a range of tools that can be incorporated into a district plan to assist with adaptation and managing the effects of natural hazards. The effectiveness of the tools will depend on the level of risk. These tools and the circumstances where they can be effectively applied include the following.

Level of Risk	Approach	Tools	Comment
High	Avoid	<ul style="list-style-type: none"> <li>• Zoning to identify area at risk e.g.               <ul style="list-style-type: none"> <li>- flood hazard</li> <li>- flood plain</li> </ul> </li> <li>• Activity classification to prevent or restrict development e.g.               <ul style="list-style-type: none"> <li>- prohibited</li> <li>- non complying</li> </ul> </li> <li>• Restrict activity types to e.g.               <ul style="list-style-type: none"> <li>- passive recreation</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Subdivision and development prevented in high risk areas.</li> <li>• Most effective in urban areas where development has yet to occur and areas identified as future urban.</li> <li>• Prevents problems arising in the first instance.</li> <li>• Need a high level of confidence in information and data to identify these areas on district plan maps.</li> <li>• Integrated and consistent approaches required with regional councils and their plans.</li> </ul>
High	Remedy	<ul style="list-style-type: none"> <li>• Zoning to identify area at risk.</li> <li>• Activity classification to prevent development and redevelopment.</li> <li>• Activity classification to prevent/restrict protection works.</li> <li>• Activity classification to facilitate relocation of building to other parts of the City/district.</li> <li>• Restrict activity types to e.g.               <ul style="list-style-type: none"> <li>- passive recreation</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Tools support a strategic decision to retreat in the face of the hazard and to make it difficult to carry out hazard protection works.</li> <li>• Applicable in areas that have been developed.</li> <li>• Need a high level of confidence in information and data to identify these areas on District Plan maps.</li> <li>• Integrated and consistent approaches required with regional councils and their plans.</li> <li>• Potential issues with existing use rights.</li> </ul>
High	Mitigate	<ul style="list-style-type: none"> <li>• Zoning to identify areas to prevent development and restrict redevelopment.</li> <li>• Activity classification to prevent development and restrict redevelopment e.g.               <ul style="list-style-type: none"> <li>- prohibited</li> <li>- non complying</li> </ul> </li> <li>• Restrict activity/building types to e.g.               <ul style="list-style-type: none"> <li>- passive recreation</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Applicable in areas that have been developed.</li> <li>• Need a high level of confidence in information and data to identify these areas on District Plan maps.</li> <li>• Integrated and consistent approaches required with regional councils and their plans.</li> <li>• Potential issues with</li> </ul>

Level of Risk	Approach	Tools	Comment
		<ul style="list-style-type: none"> <li>- re-locatable buildings</li> <li>• Use of standards to control redevelopment e.g.               <ul style="list-style-type: none"> <li>- setbacks</li> <li>- only allow internal changes to buildings</li> </ul> </li> </ul>	existing use rights.
Medium	Mitigate	<ul style="list-style-type: none"> <li>• Zoning or overlays to identify areas where development and redevelopment needs to be managed to mitigate effects.</li> <li>• Activity classification to control development and redevelopment e.g.               <ul style="list-style-type: none"> <li>- discretionary</li> <li>- restricted discretionary</li> </ul> </li> <li>• Use of standards to mitigate effects e.g.               <ul style="list-style-type: none"> <li>- setbacks</li> <li>- floor levels</li> <li>- lot sizes</li> </ul> </li> <li>• Requirement of climate change impact statements to support resource consent applications.</li> <li>• Use of assessment criteria for considering restricted discretionary activities.</li> <li>• Facilitate the establishment of particular types of activities e.g.               <ul style="list-style-type: none"> <li>- hazard protection works</li> </ul> </li> <li>• Use of design guides.</li> </ul>	<ul style="list-style-type: none"> <li>• Applicable in areas that have been developed as well as urban areas where development has yet to occur and areas identified as future urban.</li> <li>• If using zoning need a high level of confidence in information and data to identify these areas on District Plan maps.</li> <li>• Overlays have the potential to provide greater flexibility than zoning and allow for a wider range of activities to establish.</li> <li>• Integrated and consistent approaches required with regional councils and their plans.</li> <li>• Potential issues with existing use rights.</li> </ul>
Low	Mitigate	<ul style="list-style-type: none"> <li>• Overlays to identify areas where development and redevelopment needs to be managed to mitigate effects.</li> <li>• Activity classification to control development and redevelopment e.g.               <ul style="list-style-type: none"> <li>- restricted discretionary</li> <li>- controlled</li> </ul> </li> <li>• Use of standards to mitigate effects e.g.               <ul style="list-style-type: none"> <li>- setbacks</li> <li>- floor levels</li> <li>- lot sizes</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Applicable in areas that have been developed as well as urban areas where development has yet to occur and areas identified as future urban.</li> <li>• Overlays have the potential to provide greater flexibility than zoning and allow for a wider range of activities to establish.</li> <li>• Integrated and consistent approaches required with</li> </ul>

Level of Risk	Approach	Tools	Comment
		<ul style="list-style-type: none"> <li>• Requirement of climate change impact statements to support resource consent applications.</li> <li>• Use of assessment/performance criteria for considering restricted discretionary/controlled activities.</li> <li>• Use of design guides.</li> <li>• Inclusion of standards on permitted activities e.g.               <ul style="list-style-type: none"> <li>- setbacks</li> <li>- floor levels</li> <li>- lot sizes</li> </ul> </li> </ul>	<p>regional councils and their plans.</p> <ul style="list-style-type: none"> <li>• Potential issues with existing use rights.</li> <li>• Use of less restrictive activity types e.g. controlled to high light potential risk to land owners and allow them to make the decision regarding the risk or permitted activities with standards that address the risk.</li> </ul>