



# **TAURANGA CITY COUNCIL**

## **CITY PLAN SECTION 32 REPORT**

### **Chapter 8– Natural Hazards**



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## **1. INTRODUCTION**

The 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 City Plan.

Section 32 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:

- (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.

This report fulfils the obligations of the Council under s32 of the RMA. The following is a section 32 analysis in regard to Chapter 8 – Natural Hazards. It should be read together with the text of the proposed City Plan itself.

## **2. PURPOSE OF THE CHAPTER**

The range of natural hazards to which Tauranga City is susceptible largely reflects the area's physiography and climate and can be summarised as follows:

- Flooding of low lying areas including areas adjacent to the inner harbour;
- Land instability of both cliff faces and sloping ground;
- The presence of low lying peat deposits and other highly compressible soils;
- Earthquakes and tsunami;
- Volcanic eruptions; and
- Erosion and inundation from the harbour and open coast.

Two key pieces of legislation empower Council to manage and control natural hazards; the Resource Management Act 1991 (RMA) and the Building Act 2004 (BA). Under the RMA, the use of land and subdivision is required to avoid, remedy or mitigate the effects of natural hazards. The Building Act 2004 has similar responsibilities when granting building consents on land subject to specified natural hazards, with certain exceptions.

The council's functions as outlined in section 31 of the RMA include the control of any actual or potential effects of the use, development, or protection of land, including for the purpose of the avoidance or mitigation of natural hazards. Section 7 of the RMA also requires the council to have regard to the effects of climate change.

Natural hazards are any atmospheric, earth or water related occurrence (including earthquake, tsunami, erosion, volcanic and geothermal activity, landslide, subsidence, sedimentation, wind, drought, fire or flooding) which adversely affects or may adversely affect human life, property or other aspects of the environment.

The significant resource management issue which needs to be addressed in the Plan is how to manage irregular or periodic exposure to naturally occurring events such as earthquakes, landslides, floods, erosion, slope instability, subsidence and sea storm surge.

The emphasis in the management of natural hazards through the Natural Hazards Chapter is to encourage people to avoid situations in which they, or their property, could be at risk.

Objectives and Polices are developed to deal with the majority of Natural Hazards likely to occur within Tauranga City. Specific rules (and associated delineated Plan Areas) have been developed to manage development proposed with areas subject to Harbour Inundation (Flood Hazard Plan Area) and Coastal Erosion and Inundation (Coastal Erosion Plan Area and Coastal Protection Area).

### **3. RECORD OF DEVELOPMENT OF PROVISIONS**

#### **3.1 Background Research**

Through the development of the Operative District Plan, a number of studies were undertaken to:

- Identify the key natural hazard management issues for the City; and
- Collate existing hazard data, evaluate management options and develop draft objectives, policies and methods to promote appropriate management of natural hazards, including through the District Plan and Council's obligations under the Building Act.

#### **General - Natural Hazards**

The key piece of work undertaken, *Tonkin & Taylor (1995) Natural Hazards Issues and Options Report: District Plan Preparation for the Tauranga District Council* backgrounds the extent and nature of natural hazards to which Tauranga is subject. The legislative framework under which Council derives its functions and responsibilities, in terms of managing and controlling natural hazards within the City was also explored. The report summarised existing information on the nature and likely impact of the natural hazards on Tauranga with respect to the risk of life, property, and the environment. Various future management options and strategies were then discussed in detail.

The outcomes of this report was the key to developing the Operative District Plan. This study still has significant relevance in today's planning requirements under the RMA and the Building Act in relation to Natural Hazard Management.

Since the implementation of the Operative District Plan, TCC continues to undertake monitoring of two key areas of natural hazard management other than purely for State of the Environment Reporting.

These two key areas are:

- Areas subject to Harbour Inundation;
- Areas subject to Coastal Erosion and Inundation.

#### **Harbour Inundation**

Other than the aforementioned report, TCC, through the development of the Operative District Plan commissioned Tonkin & Taylor to undertake an assessment of surge levels within the Tauranga Harbour with the purpose of establishing a design surge for a 1:50 year return period surge event including a sea level rise and 2100. The outcomes of this study were utilised to develop the Flood Hazard Plan Area development and associated Objectives, Polices and Rules for the Operative District Plan.

As part of the District Plan review, Tonkin & Taylor were commissioned to undertake a re-assessment of extreme inundation levels within the Tauranga Harbour. This re-assessment was used to assist in considering any possible changes to the existing levels of inundation risk during 50 and 100 year return period storm events. This re-assessment considered more up-to-date data collected since the earlier 1999 study and utilised hydrodynamic modelling coupled with wave modelling to evaluate potential inundation levels in the harbour. The outcomes of this study have been utilised to re-affirm the Flood Hazard Plan Area as a means of managing subdivision and development in areas subject to inundation, and also to identify any required changes to the Flood Hazard Plan Area itself.

The outcomes of this Study (*Tonkin & Taylor (2008) Reassessment of the Tauranga District Inundation Levels, report prepared for the Tauranga City Council*) were:

- That the 1999 inundation levels are retained as the minimum building platform level around the harbour shoreline.
- Inundation mapping be carried using LiDAR to accurately map those areas subject to inundation

### **Harbour Incursion**

Following the outcomes of the Reassessment of the Tauranga District Inundation study which confirmed that the 1999 inundation levels be retained as the minimum building platform level as 2.7 – 2.9 below Moturiki Datum, a further study was commissioned to look at the potential incursion distances that may occur inland when considering the harbour inundation design storms defined in the above work. The approach used is a desk-top study and simple empirical formula, using the United States overland inundation method established for FEMA and the existing TCC Digital Terrain Model.

The Study (*Tonkin and Taylor (2009) Tauranga Harbour Inundation Assessment – Overland Inundation Mapping, report prepared for the Tauranga City Council*) Tauranga has shown that where potential wave run-up is low and the ground slope is steep, the recommended inundation level remains as specified in the 2007 Harbour Inundation Report (as outlined above). In areas where wave run-up potential is high and the ground slope is shallow, a new recommended inundation level is calculated. For most of the eastern shores of the study area (Tauranga Harbour), the recommended inundation levels remain unchanged. In other areas of the harbour, a new inundation level is recommended, that ranges from 2.5 – 2.9m.

These areas include:

- Memorial Park,
- The Strand;
- Sulphur Point,
- The Mall (Mount Maunganui)
- Takitimu Drive; and
- Kulim Park.

The recommended inundation levels for these areas have been verified against observations of flotsam lines following Cyclones Fergus and Drena.

### **Coastal Erosion (Open Coast)**

Since 1980 consideration has been given, in some form, to coastal erosion and inundation hazards in the Tauranga City environs.

In 1994 Tauranga City Council (TCC) (then known as Tauranga District Council) commissioned the Centre for Environmental and Resource Studies (CEARS) to undertake an assessment of coastal erosion and inundation hazards and to provide Council with an opinion as to a management framework for the coastal erosion and inundation hazards. The report recommended to Council that a unified programme of hazard management be utilised to manage the risks associated with the coastal erosion and inundation hazards. Broadly speaking, the unified approach utilises elements of risk acceptance, event protection, damage prevention and loss distribution. These four elements have, in various ways, been incorporated into the provisions.

Further to the work undertaken by CEARS, TCC commissioned a comprehensive coastal erosion and inundation hazard risk assessment (termed Project “Dunewatch”) along the Mount Maunganui/ Papamoa coastline, which was completed in April 1996. This coastal erosion and inundation hazard risk assessment identified the potential for coastal erosion and inundation to affect land adjacent to the coast within the next 100 years.

The Project “Dunewatch” report defined hazard zones based on research utilising enhanced computer-based determination technology (GIS). These zones provide guidance on the degree of erosion risk and appropriate guidance on planning controls to the individual property level.

Council's decision to undertake the Project “Dunewatch” report and to adopt its conclusions, and graduated coastal erosion and inundation hazard zones, was the subject of a lengthy district plan appeal to both the Environment Court and the High Court between 2001-2004. Technical issues relating to the determination and validity of the coastal erosion and inundation hazard zones were rigorously challenged and debated. The Court ultimately concurred with the approach taken by the district plan and upheld the validity, and positions, of the coastal erosion and inundation hazard zones, except for the safety buffer zone which was removed.

### **Update of the Coastal Erosion Hazard Risk Zone (CHEPA)**

In 2009, TCC commissioned Tonkin & Taylor to update the coastal erosion hazard risk zones along the open coast between Mount Maunganui and the southern end of Papamoa.

Council undertook this review as it is committed through the Operative District Plan to undertake 5 yearly reviews, taking into account any new information and the ongoing profile monitoring.

Over the last 10 years there has been additional beach profile monitoring at 18 open coast beach profile monitoring stations as well as new LiDAR survey and geo-referenced aerial photographs. There has also been updates of climate change effects and new guidelines on managing coastal hazards from the Ministry for the Environment.

The outcomes of this review are outlined in the Report *Tonkin & Taylor (2009) Coastal Erosion Hazard Zone Update – Tauranga Open Coast*.

## **Previous Plan Changes to the Operative District Plan**

### **Plan Change 13 – Amendment to Flooding Hazard Provision**

The key issue for Plan Change 13 was natural hazard management within the Tauranga City local authority area. The operative district plan clearly signalled Council's intent to set flood levels for subdivision, use and development. Plan Change 13 did not seek to change this intent nor the framework in which development may be restricted in order to avoid, remedy or mitigate hazard risk to people, property and the environment. It did however seek to utilise recent scientific research undertaken by Tonkin & Taylor to establish revised flooding hazard levels.

### **Plan Change 40 – Temporary Activities in the Coastal Hazard Erosion Policy Area**

Due to the district plan being made operative in October 2003, and unless existing use rights apply, infrastructure associated with temporary events at the Main Mount beach and other areas is currently prohibited by the coastal hazard provisions of the plan (Chapter 17).

Plan Change 40 is corrected this oversight by enabling temporary buildings and structures associated with temporary activities to be erected in certain recreational beach areas for the duration of the activity. This includes the erection of temporary grandstand seating for spectators in the coastal hazard erosion policy area. The amendment sought to allow infrastructure associated with temporary activities, and other temporary uses not currently provided for, under the coastal hazard rules of the district plan.

### **Plan Change 45 – Refinement of Coastal Hazard Provision**

Arising from Environment Court directives and evolving best-practice over the last 10 years, a plan change to the operative Tauranga District Plan was undertaken to refine the current coastal hazard management provisions contained in Chapters 6 and 17 of the plan.

It was not intended to amend the coastal hazard zones identified in the district planning maps which were been endorsed by the Environment Court in *Skinner v TDC* (RMA 1666/98). The exception was only the Safety Buffer Zone, which the Court has determined to be unnecessary and was be removed from the planning maps for Mt Maunganui and Omanu to bring in to line with Papamoa Township.

Plan Change 45 arose from the final decision of the Environment Court of 6 November 2004 on an appeal to the coastal hazard provisions of the Tauranga District Plan for Papamoa. The Court dismissed the appeal but directed Council to undertake a plan change for all of the open coastline from Mt Maunganui to Papamoa to improve the management of coastal hazard risk within beachfront areas.

The proposed change sought to add certainty and detail for Council and landowners in line with best practice and what Council has learnt as a regulatory authority since the original coastal hazard policies and rules were drafted 10 years ago. The intent of the plan for coastal hazard management, such as protecting the sand dunes, allowing existing uses to continue, and prohibiting subdivision in the Extreme Risk Zone, would remain unchanged.

Key proposed changes included:

- Reference to the Environment Court process and the resolution of the need for the coastal hazard zones;
- Amending the names of each risk zone, i.e. Extreme Risk Zone would be Current Erosion Risk Zone, High and Medium Risk Zones become 100-yr and 50-yr Erosion Risk Zones;
- Removal of the Safety Buffer Zone;
- Recognition that coastal hazard risk within the Current Risk Zone is too great to allow new buildings or structures, major alterations or additions to existing buildings;
- Recognition of existing use rights and thus provision for minor alterations and minor work;
- Provision for activities in the 50 and 100 year Erosion Zones;
- Information gathering, monitoring and review.

The plan change also included the provision for refining the coastal hazard maps as 5-yearly reviews are conducted and as more up-to-date aerial photography for the GIS model was undertaken.

### **Further Relevant Studies**

The following are associated key studies that underpin the Natural Hazards Chapter:

- State of the Environment Monitoring - Data from regular monitoring of natural hazards within the City boundaries. The key hazard issues measured are:
  - Variation Between Storm Surge and High-Tide Levels for Tauranga Harbour;
  - Projected Sea Level Rise;
  - Change in Sand Volumes on Coastal Beaches;
- Government Publications available on the MfE website ([www.mfe.govt.nz](http://www.mfe.govt.nz)):
  - Natural Hazard Management;
  - Coastal Hazards and Climate Change: A Guidance Manual for Local Government in New Zealand;
- Local Government Adaptation to Climate Change: ENVBOP and Coastal Hazards “Issues, Barriers’ and Solutions.”
- NIWA (2004) Tsunami Hazard for the Bay of Plenty and Eastern Coromandel Peninsula, Client Report: HAM2004-084.
- NIWA (2006) Wairakei/Te Tumu Tsunami Inundation Study, Client Report CHC2006-020

### 3.2 Consultation Outcomes

In August of 2008 general consultation of issues associated with the Natural Hazard Chapter and options to address these issues was undertaken. The following feedback was received:

- Do not allow multi-unit development in low lying areas;
- Due to the large effort by Council taken to achieve the current policy approach, the Department supports not changing or reducing control Council has over this matter. It is appropriate that Council update the physical extent of the CHEPA lines if the available information warrants it, in line with the method in the District Plan. It is important that this update includes models of currently understood medium and long term coastal process cycles and changes so that development will not be permitted in areas that will become subject to foreseeable coastal hazards within a long term timeframe (Department of Conservation);
- Environment Bay of Plenty supports the issues and options paper on the development of rules for various types of natural hazards. Currently hazard matters, such as slope stability, peat soils, compressible soils, de watering and relic slips are managed through either the Land Information Memoranda, Project Information Memoranda and building consent process or the resource consent processes employed by Tauranga City Council. These processes draw upon available information recorded on GIS and property files on these hazards. Setting rules in the District Plan to manage hazards, beyond those currently listed into the District Plan (coastal hazards, flooding) may be necessary to safeguard people and their property from hazard events. In such situations, EBOP would be fully supportive of additional rules around hazard management.
- The current coastal hazard erosion plan area (CHEPA) and coastal protection area provisions in the District Plan provide for sustainable management of development along the Mount Maunganui - Kaituna coast.

Subsequent to the original analyses and demarcation of the CHEPA in 1994, 1996 and 2004, new information is available. Beach profile monitoring has been undertaken by the City Council since 1998 in addition to the monitoring undertaken by EBOP since 1967. The IPCC has also updated the values for 'projected sea level rise' for the next 100years. A Ministry for the Environment assessment of this data applied to the New Zealand context resulted in the recent release of the 'Coastal Hazards and Climate change – A Guidance Manual for Local Government in New Zealand.

Given the above, EBOP supports a review of the existing and new information to determine whether or not a full assessment of the position of the erosion zones (and inundation where necessary) is warranted. It is appropriate to ensure that the CHEPA review is undertaken every 5 years as set out in the Plan, although TCC may choose not to formally amend the hazard zones and the location of the CHEPA.

However, a long term planning approach to coastal hazard risk needs to continue to be adopted. The intent of the coastal hazard zone is to take a 100 year planning horizon and not to amend the zones every 5 years unless there is a significant change in the location of the CHEPA line.

In that respect, EBOP would support the CHEPA providing effective management system drawing on case law on the implementation of coastal hazard provisions and the coastal hazard policy directives of the New Zealand Coastal Policy Statement and the Regional Coastal Environment Plan.

In April of 2009 a community feedback exercise was undertaken on draft content for the City Plan. As a result of this process the following feedback was received:

- Questions were raised over the validity of the Chapter;
- Questions were raised over the definition of protection works and why those works are not prohibited along roads;
- Questions over whether all the Hazards that could occur within the City jurisdiction have been taken into account of;
- Requests to amend definitions and enable certain activities to occur within the Coastal Protection Area.

### **3.3 Council Meetings**

Elected Members discussed the development of the Natural Hazards Chapter on the following dates. The outcomes of each discussion are also listed.

#### **Meeting: Strategy and Policy Committee - 28<sup>th</sup> May 2008**

##### **Issues Discussed:**

- Overview of Natural Hazards, and natural hazard management;
- Review of the Coastal Hazard Erosion Protection Area (CHEPA); and
- Incorporation of Rules to manage Natural Hazards (other than Coastal Hazards) in the District Plan.

##### **Meeting Outcomes:**

- Undertake review of the existing information to obtain updated CHEPA lines and provide for these in the reviewed District Plan.
- Develop a series of additional controls to manage these natural hazards, such as:
  - Slope Stability;
  - Peat Soils;
  - Compressible Soils;
  - De-watering;
  - Relic Slips.

#### **Meeting: Strategy and Policy Committee - 8<sup>th</sup> December 2008**

##### **Issues Discussed:**

- Review of the Coastal Hazard Erosion Protection Area (CHEPA); and
- Incorporation of Rules to manage Natural Hazards (other than Coastal Hazards) in the District Plan.

##### **Meeting Outcomes:**

###### **Review of the CHEPA**

The District Plan identifies that TCC will review every 5 years, using all available information, the physical extent of the CHEPA. Preliminary discussions identify that the reviewed information will deliver a more accurate CHEPA line which would shift slightly seaward, however some areas may result in a landward shift. Elected members agreed through the initial issues and options discussion that the review of the CHEPA lines would proceed. The reason to undertake this review, other than that outlined in the District Plan, is that in the previous coastal hazard zone assessments the historic rate of long term erosion has not been reviewed or modified since the original assessment of Dr Gibb in the early 1990's. Since that time there has been ongoing data collection at the 20 open coast beach profile monitoring stations situated at regular intervals along the coast, with data now available from 1977/1978 to the present at eight sites and from 1999 to the present at the remaining 12 sites. In addition, there is more recent short term data at a series of profiles in the vicinity of the Tay Street reef. TCC also has a more comprehensive series of orthorectified aerial photographs that overlap the period of beach profile measurements and more recent high resolution LiDAR survey data. T&T are currently undertaking the review of the CHEPA lines.

The outcomes of this work will be known in late December/early January and will be produced in the proposed Tauranga District Plan for public comment in March (subject to approval from Elected Members to implement the findings of the study).

Elected Members agreed to continue to move forward with this project.

### **Development of further rules to manage Natural Hazards**

The current District Plan has a series of Objectives and Policies relating to the sustainable management of subdivision and development in areas prone to Natural Hazards. The Plan, however identifying these Objectives and Policies, does not have associated rules to sustainably manage development within identified hazards areas other than coastal erosion. Rather, the Plan relies on management of these through subdivision and building consent processes. Elected members discussed this matter through the initial issues and options phase of the District Plan review and concluded that staff should look at developing a series of additional controls to manage these natural hazards, such as:

- Slope Stability;
- Peat Soils;
- Compressible Soils;
- De-watering;
- Relic Slips.

After further discussion in house with TCC staff, and considering how other Councils manage natural hazards it has been concluded that there is no need to develop specific rules within the District Plan to manage natural hazards (other than for coastal erosion) as both the subdivision requirements within the RMA and the Building Act requirements are sufficient to manage natural hazards. What can be improved is the in-house business rules in which the Environmental Planning, Building Services and the City Development activity areas work and communicate to pre-empt any issues that might occur through the processing of subdivision, resource or building consents. It is however intended to undertake the monitoring of consents within areas of natural hazards through District Plan effectiveness so that Council can collect data to make sure that Councils meets is monitoring requirements under the RMA.

Elected Members agreed to continue with the current regime of only having rule requirements for coastal and harbour erosion and flooding.

### **Meeting: Strategy and Policy Committee - 19<sup>th</sup> February 2009**

#### **Issues Discussed:**

- Presentation of the Draft Natural Hazards Chapter for community feedback which was endorsed for that process.

### **Meeting: Strategy and Policy Committee – 7<sup>th</sup> July 2009**

- Presentation community feedback received through the community engagement process, and associated issues and options to that feedback;
- Presentation on the review of the review of the CHEPA lines; and
- Presentation on the review of the Flood Hazard Plan area (harbour flooding, inundation and incursion).

#### **Meeting Outcomes:**

- Update the CHEPA lines to reflect the outcomes of the Tonkin and Taylor studies;
- Update the Flood Hazard Plan Area to reflect the outcomes of the Tonkin and Taylor Studies;
- Make no further changes to the Draft Plan content, save for including an updated definition on Coastal Protection Works.

### 3.4 Relevant Legislation, Strategies and Policy

#### Resource Management Act 1991

The overall purpose of the RMA is to promote the sustainable management of natural hazards and physical resources (Section 5). Both Regional and District Councils have responsibilities under the Act for control of the use of land, for the avoidance and mitigation of hazards.

Specific functions of territorial authorities are set out in the Act. With respect to natural hazards, these include the reduction of natural hazards, and the control of land use and subdivision.

Section 31(b) states that every territorial authority has as a function:

#### *Functions of territorial authorities under this Act*

(1) *Every territorial authority shall have the following functions for the purpose of giving effect to this Act in its district:*

(a) *the establishment, implementation, and review of objectives, policies, and methods to achieve 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; and**

**(ii) the prevention or mitigation of any adverse effects of the storage, use, disposal, or transportation of hazardous substances; and**

**(iia) the prevention or mitigation of any adverse effects of the development, subdivision, or use of contaminated land:**

**(iii) the maintenance of indigenous biological diversity:**

(c) *[Repealed]*

(d) *the control of the emission of noise and the mitigation of the effects of noise:*

(e) *the control of any actual or potential effects of activities in relation to the surface of water in rivers and lakes:*

(f) *any other functions specified in this Act.*

Section 73 of the RMA requires each territorial authority to prepare a District Plan. 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-*

(a) *any national policy statement; and*

(b) *any New Zealand coastal policy statement; and*

(c) *any regional policy statement.*

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

(c) *a regional plan for any matter specified in section 30(1).*

National and regional documents of relevance to the management of natural hazards in Tauranga include:

- The New Zealand Coastal Policy Statement;
- The Proposed New Zealand Coastal Policy Statement;
- The Bay of Plenty Regional Policy Statement; and
- The Bay of Plenty Regional Coastal Plan;

## **The Building Act 2004**

The Building Act 2004 prescribes the legal requirements for all buildings in New Zealand.

Section 37 of the 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 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 Maori 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.

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 tsunami.

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.

#### **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) *s known to the territorial authority; and*
- (c) *is not apparent from the district plan under the Resource Management Act 1991.*

## **New Zealand Coastal Policy Statement**

The New Zealand Coastal Policy Statement (NZCPS) is the only mandatory National Policy Statement under the Resource Management Act 1991 (RMA).

The purpose of the NZCPS is to state policies to achieve the purpose of the RMA – to promote the sustainable management of natural and physical resources – in relation to the coastal environment of New Zealand.

The NZCPS sets out policies regarding the management of natural and physical resources in the coastal environment. Local authorities must give effect to the NZCPS through their plans and policy statements.

The NZCPS has six specific policies relating to the management of the impact of coastal hazards and potential climate change effects:

### ***Policy 3.4.1***

*Local authority policy statements and plans should identify areas in the coastal environment where natural hazards exist.*

### ***Policy 3.4.2***

*Policy statements and plans should recognise the possibility of a rise in sea level, and should identify areas which would as a consequence be subject to erosion or inundation. Natural systems which are a natural defence to erosion and/or inundation should be identified and their integrity protected.*

### ***Policy 3.4.3***

*The ability of natural features such as beaches, sand dunes, mangroves, wetlands and barrier islands, to protect subdivision, use, or development should be recognised and maintained, and where appropriate, steps should be required to enhance that ability.*

### ***Policy 3.4.4***

*In relation to future subdivision, use and development, policy statements and plans should recognise that some natural features may migrate inland as the result of dynamic coastal processes (including sea level rise).*

### ***Policy 3.4.5***

*New subdivision, use and development should be so located and designed that the need for hazard protection works is avoided.*

### ***Policy 3.4.6***

*Where existing subdivision, use or development is threatened by a coastal hazard, coastal protection works should be permitted only where they are the best practicable option for the future. The abandonment or relocation of existing structures should be considered among the options. Where coastal protection works are the best practicable option, they should be located and designed so as to avoid adverse environmental effects to the extent practicable.*

## **Proposed New Zealand Coastal Policy Statement**

The Proposed New Zealand Coastal Policy Statement 2008 states objectives and policies to achieve the purpose of the Resource Management Act 1991 in relation to New Zealand's coastal environment. The proposal contains objectives and policies addressing (amongst other matters):

- Treaty of Waitangi and tangata whenua matters;
- subdivision, use, and development (including coastal occupation charging);
- natural character, including biodiversity and landscapes;
- public access;
- water quality;
- coastal hazards;
- historic heritage; and
- the definition of restricted coastal activities, for which the Minister of Conservation will decide applications for resource consent.

The following policies were proposed, and notified for submission in March 2008. The Proposed NZCPS has no legal weight in the consideration, nor development of the City Plan, however it is important to consider matters proposed, irrespective of this proposal having no legal weight.

### ***Policy 51: Identification of hazard risks***

*Policy statements and plans shall identify areas in the coastal environment that are potentially affected by coastal hazards (excluding tsunami), giving priority to the identification of areas at high risk. Hazard risks shall be assessed over at least a 100-year timeframe, having particular regard to:*

- a. *short-term natural dynamic fluctuations of erosion and accretion;*
- b. *long-term trends of erosion or accretion;*
- c. *slope stability or other geotechnical issues;*
- d. *the potential for natural coastal features and areas of coastal hazard risk to migrate as a result of dynamic coastal processes, including sea level rise; and*
- e. *the effects of climate change on:*
  - (i) *matters (a) to (d) above;*
  - (ii) *storm frequency, intensity and surges; and*
  - (iii) *coastal sediment dynamics; taking into account the most recent available national guidance on the likely effects of climate change on the region or district.*

### ***Policy 52: Subdivision and development in areas of hazard risk***

*In areas potentially affected by coastal hazards, local authorities shall:*

- a. *avoid new subdivision and residential or commercial development on land at risk from coastal hazards;*
- b. *avoid redevelopment, or change in land use, that would increase risk from coastal hazards; and*
- c. *encourage redevelopment, or change in land use, that would reduce risk from coastal hazards, including:*
  - (i) *managed retreat, by relocation, removal or abandonment of existing structures;*
  - (ii) *replacement or modification of existing development to reduce risk without recourse to hard protection structures, including by designing for relocatability or recoverability from hazard events.*

**Policy 53: Natural defences against hazards**

*Local authorities shall provide for the protection or restoration of natural features in the coastal environment that protect land uses from coastal hazards.*

**Policy 54: Protection structures**

*When considering the potential use of hard protection structures in response to coastal hazard risk, local authorities shall:*

- a. promote alternative responses, including soft engineering solutions and the relocation, removal or abandonment of existing structures;*
- b. take into account the expected effects of climate change, over at least a 100-year timeframe; and*
- c. evaluate the likely public costs and benefits of any proposed hard protection structure, and the effects on the environment, over at least a 100-year timeframe.*

*Where hard protection structures are considered to be necessary, local authorities shall:*

- d. generally avoid the location of such structures in the coastal marine area;*
- e. promote the location of hard protection structures on private land, rather than public land, where the purpose is to protect private land;*
- f. ensure provision for the continuation or restoration of public access to and along the coastal marine area at high tide; and*
- g. ensure structures are designed to minimise consequential erosion.*

**Bay of Plenty Regional Policy Statement (RPS)**

The Regional Policy Statement was approved by resolution on the 4 of November 1999. Change No. 1 was incorporated and made operative on the on the 26 June 2008.

Territorial authorities are required to give effect to a RPS under section 75(3) of the RMA:

- (3) A district plan must give effect to—*
- (c) any regional policy statement.*

The following Objectives, Policies and Methods relate to the development of a Natural Hazards Chapter for the City Plan.

**11.3 Objective, Policies and Methods**

**11.3.1 Natural Hazards**

**11.3.1(a) Objective**

*The vulnerability to natural hazards of the region's people and communities, and its natural and physical resources, is avoided or mitigated.*

**11.3.1(b) Policies**

*11.3.1(b)(i) To promote community understanding of the risks associated with natural hazards.*

*11.3.1(b)(ii) To ensure a co-operative and integrated approach to natural hazard risk management.*

*11.3.1(b)(iii) To promote nation-wide preparedness for the relocation of large numbers of people.*

*11.3.1(b)(iv) To prepare for the relocation of a large number of people in the event of a large scale volcanic eruption.*

*11.3.1(b)(v) To recognise and protect the integrity of natural ecosystems that are natural defences against flooding, inundation or erosion, particularly where new subdivision, use and development is proposed.*

- 11.3.1(b)(vi) *To give preference to the avoidance of adverse effects on sites of ecological, cultural or natural character value, when considering hazard mitigation works.*
  - 11.3.1(b)(vii) *To ensure that where existing hazard mitigation works are having adverse effects on ecological, cultural or natural character values, the adverse effects will be remedied or mitigated, to the extent practicable.*
  - 11.3.1(b)(viii) *To locate, design and construct facilities for the storage, manufacture, use, or disposal of hazardous substances, so as to avoid or mitigate significant adverse effects arising from the loss of containment of hazardous substances as a result of the occurrence of natural hazards.*
  - 11.3.1(b)(ix) *To ensure clear allocation of responsibility for identification and avoidance or mitigation of natural hazards.*
  - 11.3.1(b)(x) *To ensure that new subdivision, use and development, and significant infrastructure are located and designed to avoid significant natural hazards, unless there is a particular functional need to locate in an area subject to significant risk. In particular, new development within existing settlements which are at risk from natural hazards, shall not result in increased vulnerability, and should aim to reduce net vulnerability over time.*
  - 11.3.1(b)(xi) *To avoid or mitigate the vulnerability of existing urban subdivision, use and development, and significant infrastructure that are at risk from natural hazards.*
  - 11.3.1(b)(xii) *To maintain the integrity of existing flood protection works to the greatest extent practicable.*
  - 11.3.1(b)(xiii) *To take into account any actual or potential effect of climate change on the occurrence or severity of natural hazards.*
  - 11.3.1(b)(xiv) *To promote individual and organisational preparedness for natural hazard events.*
  - 11.3.1(b)(xv) *To recognise that some natural features may migrate inland as a result of dynamic coastal processes and to take account of this in providing for the preservation of natural character and the protection of ecological values when subdivision, use or development in the coastal environment is being assessed.*
- 11.3.1(c) **Methods of Implementation**  
**Environment B-O-P and District Councils will co-operate in:**
- 11.3.1(c)(i) *Developing and maintaining an integrated and co-ordinated approach to hazard identification, information sharing and the avoidance or mitigation of natural hazards.*
  - 11.3.1(c)(ii) *Considering the joint funding of research where it has been identified that research is required to better identify hazards.*
  - 11.3.1(c)(iii) *Undertaking, where appropriate, an ongoing public education programme on natural hazards.*
  - 11.3.1(c)(iv) *Promoting the role of regional and district civil defence.*

- 11.3.1(c)(v) *Encouraging public participation in and contribution to measures to raise risk awareness.*
- 11.3.1(c)(vi) *Identifying which hazards may be able to be modified or controlled, and the areas they are likely to impact on, as part of a hazard analysis programme.*
- 11.3.1(c)(vii) *Encouraging the undertaking of a full analysis of the benefits and costs of any future hazard mitigation or control works proposed within the region.*
- 11.3.1(c)(viii) *Requiring an assessment of environmental effects for hazard mitigation or control activities which require resource consents.*
- 11.3.1(c)(ix) *Provide for a large scale emergency external to the region, by making provision for an influx of people from outside the region.*
- 11.3.1(c)(x) *Facilitating the maintenance of existing flood protection works.*
- 11.3.1(c)(xi) *Protecting existing flood protection works from the adverse effects of inappropriate use.*
- 11.3.1(c)(xii) *Ensuring that access to stopbanks and flood pump stations is available at all times so that maintenance works can be undertaken.*

**Environment B-O-P will:**

- 11.3.1(c)(xiii) *Identify regionally significant natural hazards and include this information in a natural hazards register and, where appropriate, in regional plans.*
- 11.3.1(c)(xiv) *Draw on existing information and commission any research required to better identify the risk posed by natural hazards where their effects are likely to cross district boundaries.*
- 11.3.1(c)(xv) *Liaise with district councils to set priorities for future research and investigations and ensure consistency of approach to research and the form of data capture, storage and retrieval.*
- 11.3.1(c)(xvi) *Work closely with district councils to ensure that all organisations involved in civil defence are committed to a co-ordinated and co-operative response in the event of a large scale natural hazard event.*
- 11.3.1(c)(xvii) *Maintain effective flood monitoring and flood warning systems.*
- 11.3.1(c)(xviii) *Have responsibility for the development and implementation of objectives, policies and methods of implementation including rules relating to the control of the following uses of land for the avoidance or mitigation of flood hazards:*
  - (a) *Soil conservation which has the purpose of avoiding or mitigating flooding and associated erosion or sedimentation;*
  - (b) *The establishment and operation of regional flood hazard monitoring and warning systems;*
  - (c) *The establishment, operation and maintenance of any flood control work administered under the Land Drainage Act 1908, the Soil Conservation and Rivers Control Act 1941 or the Rangitaiki Land Drainage Act 1956 including such works in:*
    - *the Waioeka-Otara Rivers Scheme,*

- the Huntress Creek Drainage District,
  - the Waiootahi River District and the Waiootahi Drainage District,
  - the Whakatane River Major Scheme,
  - the Rangitaiki-Tarawera Rivers Major Scheme and the Rangitaiki Drainage District,
  - the Kaituna Catchment Control Scheme (including the Upper Kaituna Catchment Control Scheme and the Lower Kaituna River Major Scheme); and
- (d) Any use of land which is the bed of a river or lake.

11.3.1(c)(xix) *Adopt and promote techniques for maintaining flood protection works that maintain and enhance the natural character and ecological values of the associated water body and its margins.*

11.3.1(c)(xx) *Include, as soon as practicable, objectives, policies and methods in regional plans, under subsection 30(1) paragraphs (a) and (b) of the Act, for the purpose of identification, avoidance and mitigation of natural hazards of regional significance and the integrated management of such hazards.*

11.3.1(c)(xxi) *Liaise with other regional councils to ensure a consistency of approach to cross boundary natural hazard risk management.*

11.3.1(c)(xxii) *Advocate to other councils in New Zealand that they make provision for the absorption of an influx of people in the event of a large scale natural hazard emergency external to their own area.*

**District Councils will:**

11.3.1(c)(xxiii) *Draw on any information and commission any research required to better identify the extent of risk due to natural hazards within their district.*

11.3.1(c)(xxiv) *Identify district and relevant regional natural hazards within natural hazards registers or district plans, and provide this information in project or land information memoranda.*

11.3.1(c)(xxv) *Have responsibility for the development and implementation of objectives, policies, and methods of implementation including rules relating to the control of the use of land, and of any actual or potential effects of the use, development or protection of land for the avoidance or mitigation of natural hazards, except for those matters specified in method 11.3.1(c)(xviii) (for which Environment B.O.P has responsibility). Responsibility is shared with Environment B.O.P in respect of natural hazards of regional significance, following method 11.3.1(c)(xx).*

**Regional Coastal Plan**

Under section 75(4) of the RMA:

*A district plan must not be inconsistent with—*

- (a) *a water conservation order; or*
- (b) *a regional plan for any matter specified in section 30(1).*

The following Objectives, Policies and Methods relate to the development of a Natural Hazards Chapter for the City Plan.

**11.2.2 Objective**

*No increase in the total physical risk from coastal hazards.*

11.2.3 **Policies**

11.2.3(a) *To take a precautionary approach to the installation of coastal hazard protection works.*

*Where existing subdivision, use or development is threatened by a coastal hazard, coastal protection works should be permitted only where they are the best practicable option for the future. The abandonment or relocation of existing structures should be considered among the options. Where coastal protection works are the best practicable option, they should be located and designed so as to avoid adverse environmental effects to the extent practicable.*

*When considering the option of protection works, the option of using soft protection works such as dune care, beach replenishment, and restoration of estuarine vegetation, should be considered.*

*When a district council identifies coastal hazard areas that include urban areas it should proactively apply this policy in consultation with the local community, Environment Bay of Plenty and other interested parties. The best practicable option selected should be included in the district plan.*

11.2.3(b) *To provide an overview of those areas within the open coast which are sensitive to coastal hazards by identifying areas sensitive to coastal hazards (ASCH).*

11.2.3(c) *Where existing urban subdivision use and development falls within an area sensitive to coastal hazards (ASCH) shown in the maps to this plan, the relevant district council should commission research to identify a coastal hazard area, and include it in the relevant district plan. That research should comply with policy*

11.2.3(f). *Policy 11.2.3(c) applies to those areas zoned for future urban development as well as existing urban areas, but does not apply to urban subdivision and land use promoted in a private plan change. Once a coastal hazard area has been identified in a proposed district plan in accordance with policy 11.2.3(f) of this plan, the ASCH identified in this plan have no further relevance to the control of subdivision, use and development in those areas and the ASCH identified in this plan shall have no further relevance to the definition of an area sensitive to coastal hazards for that area.*

11.2.3(d) *The following matters should be taken into account when considering new subdivision, use and development within existing urban areas located in coastal hazard areas identified by district councils:*

- *Policy 3.4.5 of the New Zealand Coastal Policy Statement: “New subdivision, use and development should be so located and designed that the need for hazard protection works is avoided.”*
- *Policy 11.3.1(b)(x) of the Bay of Plenty Regional Policy Statement: “To ensure that new subdivision, use and development, and significant infrastructure are located and designed to avoid significant natural hazards, unless there is a particular functional need to locate in an area subject to significant risk. In particular, new development within existing settlements which are at risk from natural hazards, shall not result in increased vulnerability, and should aim to reduce net vulnerability over time.”*

- *The need to avoid compromising implementation of the best practicable option identified in accordance with policy 11.2.3(a) of this plan.*
- *The ability to manage the physical risk from coastal hazards through appropriate conditions on resource consents.*

11.2.3(e) *Applications of new subdivision, use and development which are proposed to take place within the areas sensitive to coastal hazard (ASCH) shown in the maps of this plan should be supported by a coastal hazards analysis of that proposed area of subdivision, use and development. The New Zealand Coastal Policy Statement policy 3.4.5 states that “New subdivision, use and development should be so located and designed that the need for hazard protection works is avoided.”*

*Policy 11.2.3(e) applies to both resource consents and private plan changes but does not apply to subdivision use and development in those parts of the ASCH in which policies 11.2.3(c) or 11.2.3(d) are to be; or have been applied by the district council.”*

11.2.3(f) *The following standards and criteria should be applied to the identification of coastal hazard areas for the purposes of policies 11.2.3(c) and 11.2.3(e):*

- *Erosion impacts of sea level rise: The Intergovernmental Panel on Climate Change best estimate, presently the IPCC 1995, IS92a scenario estimates (this is 0.49 metres by the year 2100), should be used.*
- *Shoreline response to storm erosion and flooding: Scientifically appropriate models should be used, such as those based on, but not restricted to, the Bruun Rule.*
- *Planning horizon: A 100-year planning horizon should be used.*
- *Long term trend: This should be derived from cadastral, aerial photography, surveys, or other reliable historic data. The reference shore adopted should be the toe of the foredune where these land forms occur, or elsewhere should be the seaward limit of vegetation or some other datum as appropriate.*
- *Short term fluctuation: This should be derived from the most reliable records available at the time for particular stretches of the coast, and should err on the side of caution.*
- *Dune stability factor: This should be based on the angle of repose (AOR) of the dune sands as defined locally.*
- *Factor of safety: The coastal hazard area assessment should include an appropriate factor of safety, either built into the above criteria and standards, or added on in the final stage in the calculation.*
- *Any profiles (cross sections) should be carried out to accepted surveyors standards and practice. All levels must be in terms of mean sea level to Moturiki datum.*

11.2.3(g) *For estuaries and harbours, the minimum ground levels or building platforms are to be determined by joint research by the relevant district councils and Environment Bay of Plenty. The following standards and factors should respectively be applied and taken into account:*

- *sea level rise which is currently 0.49 metres;*
- *minimum annual exceedance probability of 2% (1% is recommended);*
- *tide level;*
- *barometric set up;*
- *wind set up;*
- *estuary effects;*
- *factor of safety (0.5 is recommended).*

Notes:

- 1 *The sea level rise should be the official best estimate by the Intergovernmental Panel on Climate Change (currently the IPCC 1995, IS92a scenario estimate of 0.49 metres) over a 100-year planning horizon.*
- 2 *A 2% annual exceedance probability (AEP) means that those planning the development must design for a storm surge that has 2% chance of occurring in any one year (or on average, will occur once every 50 years). This is specified as a minimum standard. It is recommended that the 1% AEP standard is adopted for large new subdivisions, or sites where the value of assets at risk is high (or difficult to insure), or where there is infrastructure (e.g. pumping stations, electricity substations) which is important to the wellbeing of the community.*
- 3 *It is recommended that the factors listed in bullets 3 to 5 are estimated as joint probabilities, by using an appropriate statistical technique. Environment Bay of Plenty has information that can assist in estimating these factors. An example of joint probability analysis is summarised in D Goring and others, *Extreme Sea Levels on the Mount Maunganui Shoreline (Moturiki Island)*, NIWA, 1997. This is available from Environment Bay of Plenty. An alternative and simpler technique is to sum the individual maximums for each factor. However, this will usually give a higher estimate of storm surge height.*
- 4 *Estuary effects includes the dynamic effect of storm surge in estuaries, wave set up at the estuary mouth which forces water into estuaries and differential wind stress across estuaries. Allowance of 0.33 metres is recommended if specific information is not available.*
- 5 *The factor of safety allows for imprecision in estimates of the factors listed in 11.2.3(g), and any other factors not explicitly estimated, e.g. wave run up on the shores of the estuary.*

11.2.3(h) *Until the work in 11.2.3(g) is completed for the landward margins of Ohiwa Harbour, the minimum ground level upon which buildings may be constructed should be 2.70 metres above Moturiki Datum plus the latest official IPCC best estimate of sea level rise (which is currently 0.49 metres), based on:*

- *maximum tide level of 1.00 metres;*
- *barometric set up of 0.33 metres;*
- *wind set up of 0.54 metres;*
- *estuary effects of 0.33 metres;*
- *factor of safety of 0.5 metres.*

11.2.3(i) *To ensure that any earthworks undertaken for the purposes of complying with policies 11.2.3(g) and 11.2.3(h) will not be subject to erosion, adversely affect the natural character of the coastal environment, or restrict flood drainage.*

11.2.3(j) *To protect natural values and features that provide natural hazard protection. This includes but is not limited to dunes, active offshore sand reservoirs and estuarine vegetation. Allowance should be made for the future inland migration of some natural features as a result of coastal processes (including sea level rise).*

11.2.3(k) *Lowering of foredunes is to be avoided.*

11.2.3(l) *To take into account the most recent mid range IPCC IS92a sea level rise scenario when considering the design and location of structures in the coastal marine area.*

- 11.2.3(m) *Buildings on the rocky open coast outside of the identified areas sensitive to coastal hazards, should be located so as to avoid the hazard of storm surge and wave run up. A minimum new building platform height of 6 metres above mean high water mark is recommended.*
- 11.2.3(n) *Buildings on the rocky open coast outside of the identified areas sensitive to coastal hazards, should be located so as to avoid the hazard of cliff or slope instability.*
- 11.2.3(o) *To discourage residential development adjacent to river mouths or other areas potentially at risk from river mouth meandering.*
- 11.2.3(p) *The ability of pohutukawa and other coastal cliff vegetation to maintain the stability of coastal cliffs is to be protected. Damage to any part of the plant, including the root systems, is to be avoided.*
- 11.2.3(q) *To encourage the incorporation of coastal hazard zones into wider building set backs or reserves established to provide for recreation, natural character, or waahi tapu. Where appropriate, research to identify coastal hazard areas should be carried out in conjunction with research on the other values of the coast.*
- 11.2.3(r) *To encourage and support initiatives designed to involve the community in Coast Care.*
- 11.2.3(s) *To promote consistency and integration with regard to future research on coastal hazards within the Bay of Plenty and neighbouring regions.*

#### **11.2.4 Methods of Implementation - Facilitation and Coordination**

*Environment Bay of Plenty will:*

- 11.2.4(a) *Promote and encourage community groups to become involved in the management (including Coast Care) of coastal hazards.*
- 11.2.4(b) *Promote and be fully involved in setting up an inter-regional forum in order to ensure both consistency of approach and data sharing between regional councils with regard to coastal hazards.*
- 11.2.4(c) *Encourage further research by other appropriate agencies into an integrated approach to the issues of coastal hazards.*

#### **11.2.5 Methods of Implementation – Services**

*Environment Bay of Plenty will:*

- 11.2.5(a) *Contribute on an equitable basis towards the costs of implementing a regional community coast care programme.*
- 11.2.5(b) *Undertake research on the issue of harbour shore erosion and the effects of harbour shore protection works.*
- 11.2.5(c) *Work with Opotiki District Council to carry out detailed coastal hazard research for those areas zoned for coastal residential purposes and will consider providing financial assistance for that research.*

Through the development of the Operative District Plan Natural Hazards Chapter, the Council utilised the guidance of Policy 11.2.3(c) and 11.2.3(e) in identifying and defining the CHEPA. This Policy is still relevant today.

Through the development of the Operative District Plan Natural Hazards Chapter, the Council utilised the guidance of Policy 11.2.3(g) in identifying and defining the Flood Hazard Plan Area and minimum floor levels.

### **SmartGrowth**

The SmartGrowth Strategy is a sub-regional response to growth management. The Strategy has a planning horizon to 2051 and provides a context for considering decisions of the present, and how they may affect the welfare of future generations.

SmartGrowth identifies that:

1. *Areas that are severely constrained by hazard effects are avoided.*
2. *Areas that are slightly or moderately constrained by hazard effects are subject to mitigation.*
3. *Community understanding of hazard risks is promoted.*
4. *Preparedness to deal with hazard events is promoted.*
5. *Natural systems that provide protection against hazards are recognised and protected.*
6. *Risk to property from hazards is not increased.*
7. *The use of hazard protection works is avoided for any new development.*
8. *Accepted standards for assessing erosion and flooding hazards, including provision for sea-level rise resulting from climate change, are taken into account in assessing hazards.*
9. *Potential climate change impacts are accounted for in new developments.*

These key issues need to be taken into account in developing any Objectives, Policies and Rules on Natural Hazards.

## 4. ISSUES

### 4.1 Summary of Issues

The range of natural hazards to which Tauranga City is susceptible largely reflects the area's physiography and climate and may be summarised as follows:

- Flooding of low lying areas, including areas adjacent to the inner harbour;
- Land instability of both cliff faces and sloping ground;
- The presence of low lying peat deposits and other highly compressible soils;
- Erosion and inundation of open coast areas; and
- Low Probability, High Risk Events (earthquakes, tsunami and volcanic eruptions).

Many of the potential hazards to which Tauranga City is susceptible are closely related.

The formulation of draft plan objectives, policies and rules will pay special attention to the integration of the various management options, in order to ensure the efficient management of natural hazards within the City.

### 4.2 General Issue - Development in Areas Prone to Natural Hazards

Use and development in areas prone to subsidence or flooding, or otherwise at risk from hazard events, such as coastal erosion or inundation, can expose people and physical resources to unacceptable risk or lead to an accelerated loss of natural resources.

#### Issue Statement

The presence of peat deposits, relic slips and active coastal processes in areas of existing and proposed development exposes people to risk of property loss and possible danger to life. There comes a point, however, when the risk of a natural hazard to the physical resources of the District becomes such that it is irresponsible to allow development to occur.

The control of the effects of land use activities, so as to avoid or mitigate natural hazards is an RMA function of the Tauranga City Council. However, inherent in that function is an assumption that the hazard concerned can be adequately mitigated or avoided. It is also important to note that the RMA explicitly removes the remedy of natural hazards as a management option (section 31). This implies that a "clean up" approach is not sufficient, they must be avoided or mitigated.

The prime issue for consideration is therefore, to identify what is the appropriate level of control that should be exercised through the City Plan. The key factors to consider are the nature and extent of natural hazards in Tauranga City and the available information outlining the particular hazard.

Consideration of the most appropriate level and means of control of natural hazards, results primarily from a broad assessment of a number of factors including;

- The likely magnitude and frequency of a particular hazard;
- The actual or potential effects of the hazard in terms of its threat to the physical environment, human life and property and other aspects of the environment;
- The level of acceptable environmental risk both Council and the wider community are prepared to accept; and
- The statutory responsibilities (and consequential liabilities) of the Council.

This table identifies the appropriateness of the listed Objectives in achieving the purpose of the RMA.

### 4.2.1 Objectives

This table identifies the appropriateness of the listed objectives in achieving the purpose of the RMA.

Objective Number	Objective	Appropriateness
8.2.1.1	<p><i>Objective - Avoidance of Natural Hazards</i></p> <p><i>Subdivision, use and development are not adversely affected by natural hazards.</i></p>	<p><i>It is considered that the proposed Objective is the most appropriate way to achieve the purpose of the Act for the following reasons:</i></p> <ul style="list-style-type: none"> <li><i>• The Council, having identified a resource management issue related subdivision and development within areas prone to Natural Hazards. Council is required by Section 106 of the RMA to have particular regard to natural hazards in relation to subdivision of land, which states:</i> <p><i>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—</i></p> <ul style="list-style-type: none"> <li><i>(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</i></li> <li><i>(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</i></li> <li><i>(c) .....</i></li> </ul> <p><i>(2) Conditions under subsection (1) must be—</i></p> <ul style="list-style-type: none"> <li><i>(a) for the purposes of avoiding, remedying, or mitigating the effects referred to in subsection (1); and</i></li> <li><i>(b) of a type that could be imposed under section 108.</i></li> </ul> </li> <li><i>• The Objective defines the overall goal to avoid areas prone to natural hazards.</i></li> </ul>

Objective 8.2.1.1 is addressed through Policy 8.2.1.1.1 and 8.2.1.1.2 and 8.2.1.1.3. These policies are to be achieved through:

- Rules relating to the activity status that applies to activities within areas subject to Natural Hazards.

#### 4.2.2 Policies, Methods and EREs

<p><i>Policies and Methods</i></p>	<p>8.2.1.1.1 <i>Policy – Avoidance of Natural Hazards</i>  <i>By ensuring that subdivision, use and development avoid the effects of natural hazards.</i></p> <p>8.2.1.1.2 <i>Policy - Functional need to undertake subdivision, use or development</i>  <i>By ensuring that where there is a functional need to undertake subdivision, use or development in an area subject to natural hazard risk, that activity is specifically designed to mitigate against those adverse effects.</i></p> <p>8.2.1.1.3 <i>Policy – Reduction in nett vulnerability</i>  <i>By ensuring that development within existing developed areas that are at risk from natural hazards shall not result in increased vulnerability, and any proposed development shall aim to reduce nett vulnerability over time.</i></p>
<p><i>Costs</i></p>	<p><i>Limited cost as these Policies are overall general guidance on the implementation of the Natural Hazards Chapter. Any cost will be associated with the specific relevant Policies for the Chapter, and associated rules (as an example – Activities in areas subject to Coastal Erosion and Inundation)..</i></p>
<p><i>Benefits</i></p>	<p><i>The benefit is that the above Policies provide overall direction and guidance to acceptability of means of activities in areas subject to Natural Hazards. These Policies support the specific issues Policies and provide additional guidance.</i></p>
<p><i>Efficiency</i></p>	<p><i>Efficient as the Policy provides guidance on what and where development is expected, however leaves control of these developments to the efficient processes of the Building Act (or RMA through Subdivision) and associated specific Policies for areas subject to Natural hazards. ..</i></p>
<p><i>Effectiveness</i></p>	<p><i>The Policy is effective at achieving the stated Objective. The Policy provides guidance on Councils and the communities expectations on managing risk in areas subject to Natural Hazards. .. The Policy provides a clear directive that these areas are to be avoided.</i></p>
<p><i>Appropriateness</i></p>	<p><i>Appropriate as it achieves the requirements of the RMA, specifically Councils functions under Section 31(b) and provides clear guidance on Council expectations on managing risk in areas subject to Natural Hazards. .</i></p>

<p><i>Alternative 1 – Do nothing – no Policy</i></p>	<p><i>The alternative to ‘do nothing’ has potential costs in that there is a risk of not providing direction on where subdivision, use and development is not appropriate, nor overall guidance on Council and community expectations in managing Natural Hazard risk.. A potential benefit however is that there will be less constraint on economic development within these areas, however there is an overall moderate risk that subdivision, use and development in these areas will be adversely affected by a Hazard. The Alternative is not efficient as it requires more individual assessments on the effect of those areas/ for development proposals and increases the risk of damage to these values. It is not effective nor efficient as it does not support the Objective nor does it provide overall guidance/support for other Polices listed in the Natural Hazards Chapter.</i></p>
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### **4.3 Issue – The Use of Land in Areas of Highly Compressible Soils, Including Peat Deposits Can Cause Instability of Structures.**

The principal adverse effects associated with the presence of peat deposits and other highly compressible soils are manifested through instability of structure. The peat deposits are mostly found behind the open coastal dune system. The remaining highly compressible soils are located primarily adjacent to the Tauranga Harbour.

Construction on peat presents numerous engineering problems, the main one being settlement of the peat under the weight of the structure. Ancillary activities associated with development, may also give rise to differential settlement of the peat reducing groundwater levels (for example drainage, roading, farm developments). Cumulative effects of progressive building development may also result in the drainage of peat. This may have the effect of lowering the ground levels with time, and may lead to the failure of piles and foundations.

The identified peat deposits found within the City appear to have formed in a lagoon or estuarine environment behind the coastal sand dunes, and, up until recently, are primarily use for intensive agriculture and horticulture, although pockets of peat deposits lie within the built up Mount Maunganui/Papamoa urban area, particularly in the dune troughs.

In terms of considering the level of risk associated with the presence of peat, it is significant that most of the adverse effects of the peat hazard are likely to be largely confined to the immediate vicinity of the site concerned. It is also of significance that unless otherwise mitigated, most structures are liable to damage through settlement if constructed on top of or directly adjacent to the existing peat deposits. The risk to life associated with the peat hazard is likely to be minimal.

The peat hazard therefore represents a low impact but high frequency occurrence type of hazard, with very localised and predictable impacts.

### 4.3.1 Objectives

This table identifies the appropriateness of the listed objectives in achieving the purpose of the RMA.

Objective Number	Objective	Appropriateness
8.2.1.2	<p><i>Objective - Avoidance of Compressible and Liquefiable Soils</i></p> <p><i>The risk to life, property and the environment resulting from the subdivision, use and development of land subject to, or likely to be subject to induced subsidence from liquefaction, peat or other highly compressible soils are avoided.</i></p>	<p><i>It is considered that the proposed Objective is the most appropriate way to achieve the purpose of the Act for the following reasons:</i></p> <ul style="list-style-type: none"> <li><i>• The Council, having identified a resource management issue related subdivision and development within areas prone to Natural Hazards. Council is required by Section 106 of the RMA to have particular regard to natural hazards in relation to subdivision of land, which states:</i></li> </ul> <p><i>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—</i></p> <ul style="list-style-type: none"> <li><i>(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</i></li> <li><i>(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</i></li> <li><i>(c) .....</i></li> </ul> <p><i>(2) Conditions under subsection (1) must be—</i></p> <ul style="list-style-type: none"> <li><i>(a) for the purposes of avoiding, remedying, or mitigating the effects referred to in subsection (1); and</i></li> <li><i>(b) of a type that could be imposed under section 108.</i></li> </ul> <p><i>The Objective defines the overall goal to avoid areas of Compressible and Liquefiable Soils.</i></p>

Objective 8.2.1.2 is addressed through Policy 8.2.1.2.1.

### 4.3.2 Policies, Methods and EREs

Policies and Methods	<p>8.2.1.2.1 Policy - Avoidance of Compressible and Liquefiable Soils</p> <p>(a) By ensuring that land comprised of peat, highly compressible soils or soils subject to liquefaction are avoided through the subdivision, use and development process;</p> <p>(b) By ensuring subdivision, use and development avoids the alteration of drainage patterns, the physical characteristics of the peat or compressible soils;</p> <p>(c) By ensuring appropriate solutions are applied through the subdivision, use and development process to avoid the adverse effects of peat and other compressible or liquefiable soils.</p>
Costs	<p>There are limited costs as the Policy is not supported by rules, rather the policy used to guide the subdivision and structure plan processes. In certain cases there will be consenting and compliance costs associated with those activities that wish to establish within areas of Compressible and Liquefiable Soils. This may limit some development potential for property owners.</p>
Benefits	<p>Establishes a clear framework of areas to be avoided through the zoning of land. If that land is suitable then development will be able to occur through the Building Act process.</p>
Risk	<p>Low risk as the areas known to be areas of Compressible and Liquefiable Soils are well mapped and the Building Act provides the ability to manage developments with these areas.</p>
Efficiency	<p>Efficient as the Policy provides guidance on what and where development is expected, however leaves control of these developments to the efficient processes of the Building Act (or RMA through Subdivision).</p>
Effectiveness	<p>The Policy is effective at achieving the stated Objective. The Policy provides guidance on avoiding areas of Compressible and Liquefiable Soils. The Policy provides a clear directive that these areas are to be avoided.</p>
Appropriateness	<p>Appropriate as it achieves the requirements of the RMA, specifically Councils functions under Section 31(b).</p>
Alternative 1 – Do nothing	<p>The alternative to 'do nothing' has potential costs in that there is a risk of not providing direction on where subdivision, use and development is not appropriate. A potential benefit however is that there will be less constraint on economic development within these areas, however there is an overall moderate risk that subdivision, use and development in these areas will be adversely affected by a Hazard. The Alternative is not efficient as it requires more individual assessments on the effect of those areas for development proposals and increases the risk of damage to these areas. It is not effective nor efficient as it does not support the Objective.</p>
Alternative 2 – Develop Rules to Control activities on land subject to Compressible and Liquefiable Soils	<p>The Alternative to develop rules to support the Policy is neither efficient, nor effective in that the controls are already in place through the Building Act, and through Section 106 of the RMA to control subdivision. The Alternative is not appropriate in that it duplicates existing planning processes, has increased costs that would require additional assessments and would aid no benefit to the planning process.</p>

The majority of peat lands are in the Rural Zone and used for horticulture and agriculture, or in new Urban Growth Areas where development can be managed at the structure plan level, or through resource consents. . Development pressure is low as the lands are not generally suitable for urban development and have not been zoned for urban activities. Risks from development on peat lands tend to relate to the particular site and derive from buildings and structures. There are also areas of low-lying land (often adjacent to Tauranga Harbour) which comprise soft foundation conditions, characterised by fine-grained alluvial sediments deposited in marine and estuarine environments. It is considered rules relating specifically to peat lands in the Plan are neither necessary nor the most effective or efficient means of controlling risk. The provisions of the Building Act 2004 ensure building does not result in or increase the risk of subsidence, while applications for subdivision must be assessed against Section 106 of the Resource Management Act 1991 which addresses the effects of subdivision on natural hazards and vice-versa.

#### 4.4 Issue – The Use of Areas of Land Instability.

Land instability has the potential to cause a number of adverse effects on the natural and built environments in particular;

- Severe damage to houses and buildings, including impacts on property below the landslip;
- Sever damage to infrastructure and network utilities;
- Increase soil erosion and subsequent loss of soil fertility;
- Impacts on the aquatic environment through sedimentation.

The threat to life is not considered the main issue when considering the effects of landslides in the Tauranga area. However, landslides must pose some risk to life, well being and health and safety of people.

The land instability or landslip hazard on sloping land in Tauranga involves both deep seated failures, and shallow mass movement failures.

##### 4.4.1 Objectives

This table identifies the appropriateness of the listed objectives in achieving the purpose of the RMA.

Objective Number	Objective	Appropriateness
8.2.1.3	<p><i>Objective – Hazard Management – Avoidance of Areas of Land Instability</i></p> <p><i>The risk to life, property and the environment resulting from the subdivision, use and development of land subject to, or likely to be subject to, land slippage or instability is reduced.</i></p>	<p><i>It is considered that the proposed Objective is the most appropriate way to achieve the purpose of the Act for the following reasons:</i></p> <ul style="list-style-type: none"> <li>• <i>The Council, having identified a resource management issue related subdivision and development within areas prone to Natural Hazards. Council is required by Section 106 of the RMA to have particular regard to natural hazards in relation to subdivision of land, which states: 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—</i> <ul style="list-style-type: none"> <li>(a) <i>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</i></li> <li>(b) <i>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</i></li> <li>(c) <i>.....</i></li> </ul> </li> </ul> <p><i>(2) Conditions under subsection (1) must be—</i></p> <ul style="list-style-type: none"> <li>(a) <i>for the purposes of avoiding, remedying, or mitigating the effects referred to in subsection (1); and</i></li> <li>(b) <i>of a type that could be imposed under section 108.</i></li> </ul> <p><i>The Objective defines the overall goal to avoid areas of subject to land instability.</i></p>

Objective 8.2.1.3 is addressed through Policy 8.2.1.3.1.

#### 4.4.2 Policies, Methods and EREs

<i>Policies and Methods</i>	<i>8.2.1.3.1 Policy - Avoidance of Areas of Land Instability By ensuring subdivision, use and development avoids areas of known or potential land instability where those activities, or any subsequent use that is likely to be made of the land, are likely to accelerate, worsen or cause damage to land (or in respect of the subsequent use of that land any other land or structure), structures or the environment through slippage or erosion.</i>
<i>Costs</i>	<i>There are limited costs as the Policy is not supported by rules, rather the policy used to guide the subdivision and structure plan processes. In certain cases there will be consenting and compliance costs associated with those activities that wish to establish within areas of Land Instability. This may limit some development potential for property owners.</i>
<i>Benefits</i>	<i>Establishes a clear framework of areas to be avoided through the zoning of land. If that land is suitable then development will be able to occur through the Building Act process.</i>
<i>Risk</i>	<i>Low risk as the areas known to be areas of Land Instability Soils are well mapped and the Building Act provides the ability to manage developments with these areas.</i>
<i>Efficiency</i>	<i>Efficient as the Policy provides guidance on what and where development is expected, however leaves control of these developments to the efficient processes of the Building Act (or RMA through Subdivision).</i>
<i>Effectiveness</i>	<i>The Policy is effective at achieving the stated Objective. The Policy provides guidance on avoiding areas of Land Instability. The Policy provides a clear directive that these areas are to be avoided.</i>
<i>Appropriateness</i>	<i>Appropriate as it achieves the requirements of the RMA, specifically Councils functions under Section 31(b).</i>

<i>Alternative 1 – Do nothing</i>	<i>The alternative to ‘do nothing’ has potential costs in that there is a risk of not providing direction on where subdivision, use and development is not appropriate. A potential benefit however is that there will be less constraint on economic development within these areas, however there is an overall moderate risk that subdivision, use and development in these areas will be adversely affected by. The Alternative is not efficient as it requires more individual assessments on the effect of those areas/values for development proposals and increases the risk of damage to these values. It is not effective nor efficient as it does not support the Objective.</i>
<i>Alternative 2 – Develop Rules to Control activities on land subject to Land Instability</i>	<i>The Alternative to develop rules to support the Policy is neither efficient, nor effective in that the controls are already in place through the Building Act, and through Section 106 of the RMA to control subdivision. The Alternative is not appropriate in that it duplicates existing planning processes, has increased costs that would require additional assessments and would aid no benefit to the planning process.</i>

Prominent among the natural hazard risks in the City are ground slopes greater than 2:1 and where relic slips exist due to surface geology and the presence of seacliffs. Relic slips have been identified throughout the City and an indicative 2:1 building line developed from computer modelling.

The hazard posed by land instability is considered significant. However, the available information is not definitive enough to warrant the imposition of a special hazard zone. New information assisting the assessment of site-specific instability issues is being constantly added to the natural hazard information base.

Several mechanisms will ensure risks from natural hazards are addressed. All subdivision in the Plan (other than minor matters) requires a resource consent. Section 106 of the Resource Management Act 1991 requires that natural hazards must be considered when granting a subdivision consent. Provisions of the Plan concerning subdivision and development address natural hazards in a generic way for the whole District.

Earthworks have been identified as having significant potential to trigger landslips or add to land instability and are therefore managed through specific earthworks provision outlined in the Plan through Chapter 4 – General Rules.

Building Act 2004 provisions address natural hazard risks to building and site works associated with structures and buildings.

**4.5 Issue – Subdivision and development which comprises the coastal environment, resulting in a loss of natural defences, landscape character, relationships to culture and traditions and public access**

**4.5.1 Objectives**

This table identifies the appropriateness of the listed objectives in achieving the purpose of the RMA.

<b>Objective Number</b>	<b>Objective</b>	<b>Appropriateness</b>
8.2.1.4	<p><i>Objective – Protection of the Coastal Environment</i></p> <p><i>The coastal environment within areas potentially subject to natural hazards is protected.</i></p>	<p><i>The Objective is appropriate in that it provides a strong directive to the importance of the Coastal Environment and the key areas/values that are important to mitigating against the adverse effects of Coastal Erosion and Inundation. The Objective also has the dual effect of protecting the Coastal Environment and preserving its natural character which is a Matter of National Importance and implements the requirements of the RMA.</i></p>

Objective 8.2.1.4 is addressed through Policy 8.2.1.4.1.

**4.5.2 Policies, Methods and EREs**

<i>Policies and Methods</i>	<p><i>8.2.1.4.1 Policy – Protection of the Coastal Environment</i></p> <p><i>By ensuring that subdivision, use and development within areas potentially subject to natural hazards within the coastal environment shall not compromise the integrity of:</i></p> <ul style="list-style-type: none"> <li><i>(i) natural defences to coastal hazard;</i></li> <li><i>(ii) the landscape character of the coastal environment (particularly in areas where little development has occurred);</i></li> <li><i>(iii) natural ecosystems;</i></li> <li><i>(iv) the relationship of Maori and their culture and traditions to the coast, and/or</i></li> <li><i>(v) public access to the harbour or coastal margins.</i></li> </ul>
<i>Costs</i>	<p><i>There will be consenting and compliance costs associated with those activities that wish to establish within the coastal environment. This may limit some development potential for property owners.</i></p>
<i>Benefits</i>	<p><i>Establishes a clear directive that the specific values will not be compromised. This provides certainty to the community that the natural these values and areas within Tauranga City will be continue to meet the statutory requirements of these values as they relate to Matters of National Importance.</i></p>

<i>Risk</i>	<i>Limits risk of loss of integrity of values of the Coastal Environment being damaged from inappropriate subdivision, use and development.</i>
<i>Efficiency</i>	<i>Providing the mechanism for Identifying areas within the Coastal Environment and providing a clear Policy direction that those areas/or values are not to be compromised. This is an efficient approach to addressing the issue as it is cost effective way of providing the community with the information on these areas.</i>
<i>Effectiveness</i>	<i>The Policy is effective at achieving the stated Objective. By providing the mechanism to Identifying the key areas/values of the coastal environment is an essential first step toward their protection. The Policy provides a clear directive that these areas are to be preserved.</i>
<i>Appropriateness</i>	<i>Appropriate as it achieves both the Matters of National Importance and the purpose of the RMA. It also gives effect to the requirements of Regional Policy Statement.</i>
<i>Alternative 1 – Do nothing</i>	<i>The alternative to ‘do nothing’ has significant costs in that there is high potential loss of those listed values that are important to the of the City and the protection of the Coastal Environment. A potential benefit however is that there will be less constraint on economic development within these areas, however there is an overall moderate to high risk that these areas/values will be adversely affected by subdivision, use and development. The Alternative is not efficient as it requires more individual assessments on the effect of those areas/values for development proposals and increases the risk of damage to these values. It is not effective nor efficient as it does not support the Objective to protect the Coastal Environment.</i>

#### 4.6 Issue – The Risk to Subdivision, Use and Development in Areas Subject to Coastal Erosion and Inundation along the Open Coast of Tauranga

The natural and extent of the coastal hazards associated with Tauranga have a number of implications for the planning and implementation of the City Plan. The potential impacts of the open coastal hazards with Tauranga include:

- Damage to property and infrastructure through coastal erosion;
- Damage to property and infrastructure through wave induced inundation and flooding; and
- Damage to property and infrastructure through Tsunamis (discussed in Low Probability/High Risk section of this report).

The threat to human life is not normally associated with the likely coastal hazards of Tauranga.

As well, the RMA recognises as matters of national importance the need to preserve the natural character of the coastal environment (including the coastal marine area), and the maintenance and enhancement of public access to and along the coastal marine area.

The NZCPS indicates that because of the lack of information and understanding of coastal processes occurring with the coastal areas, a precautionary approach should be adopted in respect of development adjacent to the coast. Similarly, both the NZCPS and the Regional Coastal Plan encourage the use of ‘soft’ approaches rather than ‘hard’ engineered structures for the mitigation of coastal hazards. These ‘soft’ approaches (such a dune stabilisation through planting and restriction of access) are aimed at the enhancement of the natural protection activities of the coastal environment against sea erosion.

##### 4.6.1 Objectives

This table identifies the appropriateness of the listed objectives in achieving the purpose of the RMA.

Objective Number	Objective	Appropriateness
8.3.1.1	<p><i>Objective – Avoidance of Coastal Erosion and Inundation Hazards</i></p> <p><i>The potential adverse effects of coastal erosion and inundation on land, buildings and structures is avoided.</i></p>	<p><i>It is considered that the proposed Objective is the most appropriate way to achieve the purpose of the Act for the following reasons:</i></p> <ul style="list-style-type: none"> <li>• <i>The Council, having identified a resource management issue related Subdivision and development within Areas Subject to Coastal Erosion and Inundation along the Open Coast of Tauranga. Council is required by Section 106 of the RMA to have particular regard to natural hazards in relation to subdivision of land, which states:</i></li> </ul> <p><i>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—</i></p> <p><i>(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</i></p> <p><i>(b) any subsequent use that is likely to be made of</i></p>

		<p><i>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</i></p> <p>(c) .....</p> <p>(2) Conditions under subsection (1) must be—</p> <p>(a) for the purposes of avoiding, remedying, or mitigating the effects referred to in subsection (1); and</p> <p>(b) of a type that could be imposed under section 108.</p> <ul style="list-style-type: none"> <li>• The Objective defines the actions necessary to achieve the desired environmental outcome. Those actions are the avoidance, remediation and mitigation of damage on activities, buildings and structures within the CHEPA resulting from the natural processes associated with coastal erosion and inundation. These actions are identified in section 5 as an integral element of sustainable management (s.5(2)(c).</li> <li>• The Objective correctly identifies that erosion and inundation is not the consequence of subdivision, use and development of coastal land.</li> </ul>
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Objective 8.3.1.1 is addressed through Policies 8.3.3.1.1 – 8.3.3.1.13. These policies are to be achieved through:

- Rules relating to the activity status that applies to activities within the Coastal Hazard Erosion Plan Area, and Coastal Hazard Protection Plan Area

#### 4.6.2 Policies, Methods and EREs

<i>Policies and Methods</i>	<i>8.3.3.1.1 Policy – Effect of Climate Change By ensuring that subdivision, use and development takes into account any actual or potential effect of climate change on the occurrence or severity of natural hazards.</i>
<i>Costs</i>	<i>There remains the potential for damage from the effects of climate change in areas subject to natural hazards where climate change is part of the creation/exacerbation of that natural hazard.</i>
<i>Benefits</i>	<i>Recognises the need to take into account climate change in development proposals.</i>
<i>Efficiency</i>	<i>Efficient in clearly identifying proposals need to take into account the effects of climate</i>
<i>Effectiveness</i>	<i>Effective in providing for the on-going use and investment in the area subject to development conditions and guidelines.</i>
<i>Appropriateness</i>	<i>Appropriate as a means of managing new development areas subject to natural hazard risk where climate change is part of the creation/exacerbation of that natural hazard. It is appropriate in that it also meets the requirements of Section 7(i) of the RMA.</i>

<i>Policies and Methods</i>	<b>8.3.3.1.2 Policy – Dune Protection</b> <i>By maintaining and enhancing the ability of the active dune areas to provide natural protection against coastal erosion and inundation.</i>
<i>Costs</i>	<i>Some parts of the foredune area along the coast are already developed and buildings and structures may already impede the natural protection function of the foredune. In such cases it may not be possible to enhance the capacity of the foredune to provide natural protection and there may be costs of damage to people and property as a result of storm events.</i>
<i>Benefits</i>	<i>The coast is a dynamic environment in which the foredune area is the first line of defence against inundation by providing a buffer between the sea and inland areas in which erosion (and accretion) can occur naturally. The policy provides for the maintenance and enhancement of this natural protection function so that damage beyond the area subject to accretion and erosion is avoided providing benefit to the community and the environment economically by reducing costs of damage and socially by reducing the risk of damage to people and property.</i>
<i>Efficiency</i>	<i>Efficient in providing for a gradual “sinking lid” on development and use of the buffer area to the effect that eventually the buffer will be able to provide “unimpeded natural protection”.</i>
<i>Effectiveness</i>	<i>Effective in achieving the long-term sustainable management of the coastal area in accordance with the objective by identifying the actions and outcomes required.</i>
<i>Appropriateness</i>	<i>Appropriate as a means of implementing the objective to avoid damage to land, structure and the environment arising from the natural processes of coastal erosion and inundation.</i>

<i>Policies and Methods</i>	<b>8.3.3.1.3 Policy Managing Erosion and Inundation Hazards</b> <i>(a) Existing Buildings and Activities:</i> <i>By utilising relocation, avoidance of further development and/or retreat of lawfully established existing buildings and activities in managing coastal erosion and inundation within the CHEPA.</i> <i>(b) New Subdivision or Use:</i> <i>By avoiding or mitigating the effects of new subdivision or use on the current active foredune areas in managing coastal erosion and inundation hazards.</i>
<i>Costs</i>	<i>Potential costs of damage sustained by allowing buildings and activities to remain in an active risk area.</i>
<i>Benefits</i>	<i>Clearly identifies the actions necessary to achieve the Objective.</i>
<i>Efficiency</i>	<i>Efficient in identifying a direction for development that will, on implementation, avoid coastal erosion and inundation over a 100 year time frame.</i>
<i>Effectiveness</i>	<i>Effective by emphasising avoidance and relocation as the preferred management method to enhance the natural buffering function of the foredune and achieve long-term sustainable management of the area.</i>
<i>Appropriateness</i>	<i>Appropriate as a long-term solution that would achieve the objective and increase resilience of buildings and activities in the CHEPA against damage from coastal erosion and inundation.</i>

<i>Policies and Methods</i>	<p>8.3.3.1.4 Policy – Building in the Coastal Hazard Erosion Plan Area (CHEPA)</p> <p>By ensuring that activities within the CHEPA shall be able to be practicably moved or relocated to an alternative building site beyond the CHEPA, and the foredune reinstated to maintain or enhance its natural buffering ability when that activity is exposed to risk from coastal erosion and inundation (including the foundation structures).</p>
<i>Costs</i>	Potential restriction on development opportunities where landowners choose to retain dwellings in the CHEPA.
<i>Benefits</i>	<ul style="list-style-type: none"> <li>Clearly identifies relocation as the preferred management option through the establishment of an Alternative Building Site.</li> <li>Provides a “means of compliance” option that means residents and developers do not need to go to the expense of commissioning expert input for all building works.</li> </ul>
<i>Efficiency</i>	Efficient as the policy clearly identifies what the desired outcome is.
<i>Effectiveness</i>	Effective as the provision of an Alternative Building Site safeguards the ability to relocate principal buildings from the CHEPA when this is necessary without further application or consent.
<i>Appropriateness</i>	Appropriate as a means of remediating or mitigating damage from coastal erosion and inundation to land and the environment as required by the objective.

<i>Policies and Methods</i>	<p>8.3.3.1.5 Policy – Current Erosion Risk Zone (CERZ)</p> <p>By prohibiting subdivision, use and development of sites within the CERZ, unless the activity maintains or enhances the natural buffering effect of the foredune area and presents a less than minor risk of increasing coastal erosion and inundation..</p>
<i>Costs</i>	The prohibition of activities in the CERZ imposes a restriction on private property rights within the area. This is mitigated to some degree by recognising and providing for limited activities that are unlikely to reduce the capacity of the foredune to provide natural protection.
<i>Benefits</i>	The CERZ is the first line of natural protection against the current risk and it is important that the capacity of this area is maintained and enhanced for the protection of people and property in the CHEPA and beyond.
<i>Efficiency</i>	Efficient in clearly identifying activities that can and cannot be undertaken.
<i>Effectiveness</i>	Effective in restricting future new development in the current risk zone.
<i>Appropriateness</i>	Appropriate as a means of avoiding damage to new structures in the CERZ and thus achieving the objective.

<i>Policies and Methods</i>	<i>8.3.3.1.6 Policy – 50 year and 100 year Erosion Risk Zones By providing for subdivision, use and development of sites within the 50 year and 100 year ERZs in limited and managed circumstances, while maintaining and enhancing the natural buffering ability of the foredune area.</i>
<i>Costs</i>	<i>There remains the potential for damage from coastal erosion and inundation in these areas and mitigation relies on monitoring, implementation of consent conditions and enforcement.</i>
<i>Benefits</i>	<i>Recognises the reduction of risk as the buffering capacity of the foredune increases and provides for development accordingly.</i>
<i>Efficiency</i>	<i>Efficient in clearly identifying activities that can be undertaken and the way that they may be undertaken.</i>
<i>Effectiveness</i>	<i>Effective in providing for the on-going use and investment in the area subject to development conditions and guidelines.</i>
<i>Appropriateness</i>	<i>Appropriate as a means of managing new development in the 50-year and 100-year risk zones and providing for mitigation of damage to land, structures and the environment.</i>

<i>Policies and Methods</i>	<i>8.3.3.1.7 Policy – Retention of volume of sand within the CHEPA By ensuring that subdivision, use and development of sites within the CHEPA retains the volume of sand excavated from sites within the CHEPA.</i>
<i>Costs</i>	<i>The need to provide for the volume of sand to be retained within the CHEPA imposes a cost for that sand to be respread within the dune system.</i>
<i>Benefits</i>	<i>Protects the dune system, and private property by retaining the volume of sand within areas subject to erosion, rather than that sand volume being removed from the site, and outside of the areas subject to erosion.</i>
<i>Efficiency</i>	<i>Efficient in clearly identifying actions that must be undertaken.</i>
<i>Effectiveness</i>	<i>Effective in avoiding damage to people and property by requiring the volume of sand to be retained within the CHEPA.</i>
<i>Appropriateness</i>	<i>Appropriate as a means of avoiding damage from coastal erosion and inundation and achieving the Objective.</i>

<i>Policies and Methods</i>	<i>8.3.3.1.8 Policy – Review: Development and Use By ensuring that the location of buildings, structures and activities within the CHEPA are reviewed when the crest of the foredune, or the top of any dune scarp recedes to a point within 8 metres or less to the nearest part of a building or activity, to assess the risk erosion and inundation. Buildings, structures and activities may be required to be practicably moved or relocated to an alternative building site as a consequence of the review undertaken.</i>
<i>Costs</i>	<i>The need to provide a review imposes a cost on residents and developers.</i>
<i>Benefits</i>	<i>The review will enable the actual risk to be considered at the time erosion risk is evident, and appropriate mitigation measures implemented through changed consent conditions, relocation or further monitoring.</i>
<i>Efficiency</i>	<i>Efficient in clearly identifying actions that must be undertaken.</i>
<i>Effectiveness</i>	<i>Effective in avoiding damage to people and property by enabling the buildings to be relocated to a safe and secure location before damage occurs.</i>
<i>Appropriateness</i>	<i>Appropriate as a means of avoiding damage from coastal erosion and inundation and achieving the Objective.</i>

<i>Policies and Methods</i>	<p><i>Policy 8.3.3.1.9 - Subdivision</i></p> <p>(a) CERZ:</p> <p>(i) <i>By prohibiting subdivision on land wholly located within the CERZ;</i></p> <p>(ii) <i>By enabling subdivision to be undertaken on land partially located within the CERZ, where any new allotment created complies with Policy 8.3.3.1.9 (b).</i></p> <p>(b) <i>50-year and 100-year Erosion Risk Zones</i>  <i>By ensuring that, only those allotments proposed to be created with an alternative building site, provided contiguous with and clear of the CHEPA, shall be approved.</i></p>
<i>Costs</i>	<i>Unless the risk to property in the CERZ is avoided full development rights may not be able to be realised.</i>
<i>Benefits</i>	<i>Provides for the realisation of development opportunities to the same level as the underlying zone where the risk to people and property in the CERZ is able to be avoided.</i>
<i>Efficiency</i>	<i>Efficient in providing for development opportunities while at the same time enhancing the capacity of the foredune to provide unimpeded natural protection by providing for the reduction of investment in the area of greatest risk.</i>
<i>Effectiveness</i>	<i>Effective as a means of reducing investment in the CERZ by providing for greater long-term opportunity beyond the current risk zone.</i>
<i>Appropriateness</i>	<i>Appropriate as a means of avoiding damage in the CERZ and providing for the remediation of the foredune area following subdivision and/or relocation by way of potential consent conditions.</i>

<i>Policies and Methods</i>	<p><i>8.3.3.1.10 Policy – Roads and Parking and Manoeuvring Areas</i></p> <p>(a) <i>By enabling the maintenance and upgrading of existing roads, parking and manoeuvring areas located within the CHEPA to occur, where beach or dune reinstatement is undertaken, at the completion of such works. Maintenance and upgrading undertaken shall have the least impact possible on the dunal system and enhance the buffering abilities of the foredune where appropriate.</i></p> <p>(b) <i>By only allowing hard protection works to be constructed to maintain the lifeline function of transportation network.</i></p>
<i>Costs</i>	<i>The potential for damage to roads and from road material as a result of coastal erosion and inundation. Mitigation is provided against damage to other property or the environment by ensuring that road construction is of material that breaks down when damaged</i>
<i>Benefits</i>	<ul style="list-style-type: none"> <li>• <i>Roads provide an essential lifeline means of access and communication in the event of civil emergencies including storm events. It is therefore particularly important that these lifelines are maintained and, where necessary, protected.</i></li> <li>• <i>Roads provide access to the coastline (a matter of National Importance in section 6 of the Resource Management Act, 1991) and, subject to maintaining and enhancing the foredune where possible, the community benefits from providing roads in the CHEPA.</i></li> </ul>
<i>Efficiency</i>	<i>Efficient in clearly identifying actions that must be taken to maintain and enhance the capacity of the dunal system where roads are required in the CHEPA.</i>
<i>Effectiveness</i>	<i>Effective in maintaining the lifeline communication function of roads along the coast and mitigating the potential for damage from road materials.</i>

<i>Appropriateness</i>	<i>Appropriate as a means of mitigating damage arising from coastal erosion and inundation and meeting the provisions of Part II of the RMA.</i>
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<i>Policies and Methods</i>	<i>8.3.3.1.11 Policy – Utilities, Works, Services By enabling the maintenance of existing network utilities, including stormwater discharge structures located within the CHEPA, to occur, where beach or dune reinstatement is undertaken at the completion of such works. Maintenance work of stormwater outfall structures should include remediation and mitigation works to reduce the outfall's impact on the dunal system and, wherever possible, enhance the natural buffering ability of the foredune.</i>
<i>Costs</i>	<i>Provides for maintenance of infrastructure in the foredune areas that may adversely affect the sensitive coastal environment and, if not managed appropriately, may contribute to coastal erosion and inundation.</i>
<i>Benefits</i>	<ul style="list-style-type: none"> <li>• <i>The provision of infrastructure is an integral element of development in the urban area and it is necessary to ensure that property in the CHEPA is served to urban standards.</i></li> <li>• <i>Existing stormwater outfalls provide a benefit to a much wider area and must be maintained to avoid adverse effects in those catchment areas. The policy provides for this to be achieved while at the same time providing for the enhancement of the foredune.</i></li> </ul>
<i>Efficiency</i>	<i>Efficient in clearly identifying actions that must be undertaken to maintain the foredune when work is necessary on infrastructure services in this area.</i>
<i>Effectiveness</i>	<i>Effective in maintaining the level of service expected and necessary in an urban area while maintaining the natural protection of the foredune.</i>
<i>Appropriateness</i>	<i>Appropriate as a means of remediating or mitigating damage in this area.</i>

<i>Policies and Methods</i>	<i>8.3.3.1.12 Policy – Open Space By requiring works undertaken on land zoned Open Space to enhance the natural buffering abilities of the dune system and, wherever possible, the natural character of that environment.</i>
<i>Costs</i>	<i>The exclusion of protection works may result in damage to structures such as walkways and viewing platforms in these areas. Recreational facilities may be lost.</i>
<i>Benefits</i>	<i>Provides for the enhancement of the natural buffering abilities of the foredune as well as public reserves for the benefit of the community.</i>
<i>Efficiency</i>	<i>Efficient as the policy clearly requires public works on reserves to meet the same or similar standards as works on private property in the CHEPA treating all development equitably.</i>
<i>Effectiveness</i>	<i>Effective in providing for the recreational needs of the community while maintaining and enhancing the foredune system.</i>
<i>Appropriateness</i>	<i>Appropriate as a means of mitigating damage to land, structures and the environment that may arise from erosion and inundation in this area.</i>
<i>Policies and Methods</i>	<i>8.3.3.1.13 Policy – Coastal Protection Area By avoiding subdivision, use, development in the Coastal Protection Plan Area to: (i) protect the natural coastal dune system; (ii) retain the coastal environment in an undeveloped state; and (iii) ensure that the effects of coastal erosion and inundation hazards on built development are avoided.</i>
<i>Costs</i>	<i>The policy limits development opportunities in this area.</i>
<i>Benefits</i>	<i>Development in the CPA is not provided for (considered as a non-complying activity status) thereby avoiding the potential for damage that may arise from coastal erosion or inundation.</i>
<i>Efficiency</i>	<i>Efficient in clearly identifying activities that can and cannot be undertaken.</i>
<i>Effectiveness</i>	<i>Effective in achieving the long-term sustainable management of the coastal area in accordance with the proposed objective</i>
<i>Appropriateness</i>	<i>Appropriate as a means of avoiding damage to land, structures and the environment that may arise from coastal erosion and inundation in the Coastal Protection Area if it should be urbanised.</i>

<i>Policies and Methods</i>	<i>For Policy 8.3.1.1.1 to Policy 8.3.1.1.13</i>
<i>Risk</i>	<i>Risk of Not Acting Council has undertaken extensive studies of the potential current risks as well as the potential future risks for hazard along the Bay of Plenty Coast from Mauao to the Kaituna River mouth. The outcome of these studies is that there are areas along the coast that are potentially subject to either current or future coastal erosion hazard. The underlying science identifying the potential Coastal Hazard risks was found by the Environment Court to be sound. Sufficient and certain information is therefore available to justify the Council acting in response to the resource management issue identified and continuing with this current approach.</i>

<i>Alternative 1 – Do Nothing</i>	<i>This alternative does not meet the requirements of the RMA, in particular Section 31(b)</i>
<i>Alternative 2 – Rely on the existing 5m setback for properties adjoining the Conservation Zone</i>	<i>This alternative does not meet the requirements of the RMA, in particular Section 31(b), nor is an effects based measure for avoiding, remedying or mitigating natural hazards in that the 5 metre setback is a rule to protect natural character of the open coast, rather than a measure to identify and manage natural hazards (coastal erosion and inundation).</i>

Since 1980s consideration has been given, in some form, to coastal erosion and inundation hazards in the Tauranga City environs.

In 1994 Tauranga City Council (TCC) (then known as Tauranga District Council) commissioned the Centre for Environmental and Resource Studies (CEARS) to undertake an assessment of coastal erosion and inundation hazards and to provide Council with an opinion as to a management framework for the coastal erosion and inundation hazards. The report recommended to Council that a unified programme of hazard management be utilised to manage the risks associated with the coastal erosion and inundation hazards. Broadly speaking, the unified approach utilises elements of risk acceptance, event protection, damage prevention and loss distribution. These four elements have, in various ways, been incorporated into the provisions.

Further to the work undertaken by CEARS TCC commissioned a comprehensive A coastal erosion and inundation hazard risk assessment (Project Dunewatch) along the Mount Maunganui/ Papamoa coastline, which was completed in April 1996. This coastal erosion and inundation hazard risk assessment shows the potential for coastal erosion and inundation to affect land adjacent to the coast within the next 100 years. As a result of the findings of Project "Dunewatch" it was not considered sustainable or responsible to continue to consent to uncontrolled development in these areas that are subject to coastal erosion and inundation hazards.

Risks from coastal erosion and inundation hazards are not confined to a particular property or development; the presence of one building or structure can have flow-on effects for neighbouring properties.

Balanced against this is the expectation of reasonable use of property, and the need to be able to review the risk and modify Plan provisions. Consequently, the chosen management approach for open coast hazards seeks to prohibit new development within areas where there is the potential for erosion and/or inundation within a short term erosion risk cycle (areas of Current Erosion risk), excluding those activities provided for, and to manage the type and duration of development within areas with the potential for coastal erosion and inundation over a 50- to 100-year period (50 and 100 Erosion Risk Zones).

The Project Dunewatch report has defined hazard zones based on research utilising enhanced computer-based determination technology (GIS). These zones provide guidance on the degree of erosion risk and appropriate guidance on planning controls to the individual property level. An alternative option would be not to include any specific hazard areas, or to have one zone only, encompassing all areas expected to be subject to erosion risk in the next 100-years. However, given the information provided to Council it is necessary to provide clear communication of the risk to the community by use of the graduated coastal erosion and inundation hazard zones.

Council's decision to undertake the Project Dunewatch report and to adopt its conclusions, and graduated coastal erosion and inundation hazard zones, was the subject of a lengthy district plan appeal to both the Environment Court and the High Court between 2001-2004. Technical issues relating to the determination and validity of the coastal erosion and inundation hazard zones were rigorously challenged and debated. The Court ultimately concurred with the approach taken by the district plan and upheld the validity, and positions, of the coastal erosion and inundation hazard zones, except for the safety buffer zone which has been removed.

Along the undeveloped coastline from the residential area of Papamoa East to the Kaituna River the opportunity exists to create and maintain a natural protective buffer zone based on the ecologically valuable sand dunes. Council's objective is to retain this coastal environment in an essentially natural, undeveloped state to avoid the natural erosion and inundation hazards risks experienced on the developed coastline.

It is recognised that the potential for coastal erosion and inundation hazard risk within the CERZ is too great to allow any new buildings or structures, major alterations or additions to existing buildings, or structures, or subdivision, to occur. Even so, there are substantial existing buildings located within the CERZ for which s 10 of the Resource Management Act 1991 affords protection as an existing use. Therefore minor alterations may also be protected provided they do not alter character, intensity and scale of the principal building or structure. It is also recognised that minor activities, which are ancillary to the established use may be allowed. These include gardens, minor fences, clotheslines etc. which have little or no impact on the environment and can be considered basic amenity rights.

Activities that may be considered appropriate in the CERZ include (but are not limited to) the following:

- certain beach replenishment, nourishment and restoration works associated with approved Regional Coastcare programmes;
- the erection and placement of fences, gardens, trees, garden structures, clotheslines, letterboxes and paving areas;
- the maintenance, replacement or minor alteration of existing structures and buildings within the parameters of s10 of the Resource Management Act 1991;
- the construction of decks in certain limited circumstances;
- certain public recreational facilities, including surf life saving facilities, located on public reserves or conservation areas;
- minor excavation of sand or minor removal of soil;
- maintenance works and minor upgrading to existing network utility services where beach or dune reinstatement is undertaken at the completion of the works;
- temporary activities.

However activities such as the construction of protection works for the purpose of protecting private property, recreation, conservation or reserve land, but excluding road reserve land, are unlikely to be considered appropriate in the CERZ.

Within the 50 and 100-year Erosion Risk Zones, it is recognised that the potential for risk or damage to property and life is less immediate than that posed by the CERZ and therefore certain activities, which conform to set performance criteria, may occur. These activities allow for reasonable property rights and use. These activities include the construction of new structures and dwellings, new development, the alteration of or addition to existing structures and dwellings, construction of amenity type structures (decks not requiring a building consent, fences etc) and the subdivision of land where Alternative Building Sites are able to be established contiguous with and clear of the CHEPA.

The policies also allow for the construction, maintenance and/or enhancement of appropriate works on reserves and/or conservation land.

Activities that may be considered appropriate in the 50-year and 100-year Erosion Risk Zones include (but are not limited to) the following:

- activities undertaken under the guidance of a Coastal Processes Engineer in certain cases.
- the maintenance, replacement or minor alteration of existing structures and buildings in accordance with the current TCC CHEPA Guidelines.
- new buildings or structures that:
  - are undertaken under the guidance of a Coastal Processes Engineer in certain cases;
  - are designed to be lightweight in construction, conventionally relocatable and of an appropriate design to be located in these potentially transient zones; and
  - comply with the criteria set out in the current TCC CHEPA Guidelines and
  - have floor levels that are above coastal inundation levels; and
  - may have conditions imposed at the time resource consent is granted to ensure that relocation of the new activity occurs if accelerated coastal erosion or inundation occurs.
- beach replenishment, nourishment and restoration works associated with approved Regional Coastcare programmes.

- the erection and placement/replacement of private fences, gardens, trees, garden structures, clotheslines, letterboxes and paving areas.
- works and/or activities associated with public recreational facilities on public reserves or conservation areas.
- maintenance works and minor upgrading to existing network utility services where beach or dune reinstatement is undertaken at the completion of the works;
- the construction of decks in limited circumstances.
- temporary activities.
- minor excavation of sand and minor removal of soil.

However, activities such as the construction of protection works on reserve land for the purpose of protecting private property, recreation, conservation or reserve land, excluding road reserve land, are unlikely to be considered appropriate in the 50-year and 100-year Erosion Risk Zones.

The intent of policies in reviewing any consent for buildings or activities is to enable the actual risk to be considered at that time, and appropriate mitigation measures implemented through changed consent conditions, relocation or further monitoring.

Council has, with its chosen management approach, established a means of activity compliance through the compilation of the CHEPA Guidelines. The guidelines enable individual property owners to undertake certain aspects of works or development without the need for consultation with a Coastal Processes Engineer. The guidelines have been compiled by an experienced Coastal Processes Engineer and will provide property owners with advice on acceptable solutions when undertaking activities in the CHEPA, provide more appropriate environmental outcomes and reduce compliance costs for property owners affected by the CHEPA.

Council continues to gather information concerning coastal erosion and inundation hazards. In achieving this, Council has established an additional 12 beach profile monitoring sites since 1999 along the open coast between Mount Maunganui and Papamoa, which are monitored for Council by Environment Bay of Plenty. These sites are surveyed 4 times/year, and complement the existing 5 sites within the Tauranga City coastline, monitored as part of Environment Bay of Plenty's NERM network of beach profile sites.

Research for this Plan provides a basis for applying the Coastal erosion and inundation Hazard Plan Areas to the City coastline.

Further work and assessment on Coastal Erosion and Inundation has taken place through the review of the City Plan. This review work, and associated reports are discussed in the background studies section of this report.

## **Rules, including Planning Maps, and Other Methods**

### **Effectiveness and efficiency of the proposed rules and their alternatives**

#### ***Efficiency***

The efficiency of this approach will be monitored over time through the key performance indicators of number and value of dwellings in the CHEPA (where those values are referenced to a base prior to the change becoming effective). It is anticipated that the proposed change will enable residents to continue to enjoy and maintain their property to its current or similar standards and consequent effects and it is only when significant change is proposed that retreat is necessary. This may then be achieved in an efficient, managed, way. Through this process of consent and decision the rules will be monitored and over time refined further. To this end the base data is to be reviewed on a regular basis and the Proposed Change through the District Plan review provides a mechanism for new data to be incorporated into consent applications and adopted at that time on a site-by-site basis.

Council's experience has been that without a strong regulatory framework in place the anticipated environmental outcomes do not result and the objectives fail. Council cannot risk doing nothing or fail to provide for the effective future management of the CHEPA in a sustainable manner.

#### ***Effectiveness***

It is important to determine whether the preferred approach will be more effective than other alternatives in achieving the objectives and whether this effectiveness comes at a higher cost than other alternatives. It is also important that the Council considers whether the costs potentially outweigh the benefits. In the preparation of this method it is considered that the chosen policies and rules are the best means of achieving the objective in an effective and efficient manner.

A regulatory approach to the City Plan provisions is recommended as the Council has few, if any, alternatives that enable it to fulfil its functions in terms of managing the actual and potential effects of the use, development or protection of the land in the CHEPA.

Alternatives to the regulatory approach include the use of other statutory mechanisms such as by-laws and allowing residents to provide their own mitigation on an ad hoc basis.

Having identified the issue that there is a risk from hazard events, and having undertaken research into the extent of that risk, Council is obliged to set standards for the development, use and subdivision of land within the CHEPA as there are no other reasonable mechanisms available to meet the Council's obligations under the Act. In particular Council can not rely on residents and landowners undertaking their own development and use of land in a way that achieves sustainable management as the outcome is not certain and may be provided to different standards with undue effects on land beyond each subject site.

Council has prepared Building Guidelines to ensure that use and development standards within the CHEPA are provided for in such a way that the objective can be practicably achieved. However these are not in themselves Plan Rules and without the empowering nature of the rules do not provide for enforcement action to achieve a certain outcome.

Similarly the use of by-laws does not provide for an integrated comprehensive approach to monitoring, enforcement and review of consent conditions that the proposed rules achieve. It is Council's view that without an integrated approach to management in the areas subject to coastal erosion and inundation the objective of the Act and the Plan of sustainable management could not be achieved.

Rules and a regulatory approach in general are considered to be an effective means of implementing the objective as the consequences of continuing with a *laissez faire* approach allowing new use and development in areas of current risk in particular are likely to result in damage to land, structures and the environment contrary to the stated objective.

To this end new development (other than specified activities and minor works) is prohibited in the Current Erosion Risk Zone and managed retreat is encouraged to the effect that while development remains in the CHEPA subdivision is not allowed and only when that development is removed from the CHEPA can the development potential of the site be realised. In this way while the number of titles within the CHEPA may increase over time the value of buildings will decrease reducing the costs of damage to property and the potential for risk to people living in the area.

## **The Costs and Benefits of the Proposed Policies and Rules**

Section 32(4) (a) and (b) are set out below. For the Council to be satisfied that the evaluation in s32(3) has been completed the Council must:

*For the purpose of this examination, an evaluation must take into account –*

- (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.*

The Council has assessed the particular costs and benefits of the proposed policies above and the main costs and benefits of the rules and other methods below:

### **Costs**

- Potential increased costs of design and construction in direct response to the rules (which can be satisfied by compliance with the Building Guidelines).
- Potential reduction in development opportunities while dwellings remain in the CHEPA.
- Increased costs of development and maintenance necessary to ensure that an alternative building site is achieved and maintained in the long term.
- Increased costs for the Council for monitoring and ensuring compliance of resource consents and increased administration costs.
- Increased costs of investigation, data gathering and research to ensure that the underlying integrity of the CHEPA is maintained.
- Increased costs for Council in developing and maintaining the Digital Terrain Model (DTM) on which the Hazard Zone boundaries are based and all associated costs of advice, education, ongoing consultation and supporting information.

### **Benefits**

- Improved environmental outcomes in terms of the maintenance and enhancement of the natural buffering ability of the foredune system.
- Over time the ecological characteristics of the foredune system are retained or enhanced.
- Reduced exposure to risk to people and physical resources from coastal erosion and inundation in the CHEPA.
- The ability to avoid, remedy or mitigate adverse effects on land, structures and the environment resulting from coastal erosion or inundation in the area of risk.
- The achievement of the environmental outcomes defined for the CHEPA will benefit the rest of the City.

Council has a duty to use and rely on the most up-to-date data available and the change to the Plan Maps reflects the current data and recent aerial photography. This has resulted in some change to the location of the Hazard Zone boundaries. Further monitoring will be undertaken and the data used to determine those boundaries will be reviewed on a regular basis.

It is considered that the proposed changes through the District Plan Review achieves an overall net benefit by seeking that all the proposed future development within the CHEPA occurs in a manner that protects the character and attributes of the area whilst recognising that conventional unconstrained development would adversely and irrevocably affect the buffering capacity of the foredune system.

Council has also recognised that it must adopt an integrated approach to the development and use of the CHEPA to ensure that the natural environment is protected for the long term while maintaining the rights of land owners to enjoy their existing situation for as long as they may wish. The Council considers that the alternative means, such as *laissez faire* development within the CHEPA, will not achieve the purpose of the RMA and will not result in sustainable management in terms of the RMA.

### Evaluation of Rules

Summary of costs	Limits the potential for permitted development that may otherwise be permitted in the Suburban zone.
Summary of benefits	The description of specific permitted activities in the CHEPA provides certainty in the administration of the Plan. The activities provided describe a range of public and private activities at a level that ensures an equitable balance between the two sectors. Both public and private users are limited to the same scale and intensity of activity while the types of activity ensure that the character of the area is maintained.
Efficiency	Efficient as providing more clearly for permitted activities reduces the need for resource consent approval for minor works.
Effectiveness	Effective as it ensures that development in areas subject to coastal erosion and inundation is sustainably managed while providing for the reasonable use and development of land that maintains the same or similar scale and intensity as exists.
Appropriateness	Appropriate as a means of sustainably managing activities in the CHEPA, implementing Policies 8.3.3.1.2, 8.3.3.1.3 and 8.3.3.1.10-12 (inclusive) and achieving the objective of avoiding, remedying or mitigating damage to land, structures and the environment from coastal erosion and inundation.

### Permitted Activity Rules

Summary of costs	Limits the potential for development that may otherwise be permitted in the Suburban zone.
Summary of benefits	<ul style="list-style-type: none"> <li>The provision of specific standards for permitted activities ensures that the anticipated environmental outcome is achieved.</li> <li>Providing standards for both public and private works on residential and on conservation and recreation zoned land ensures that the scale and intensity of all works permitted in the CHEPA is maintained.</li> <li>The standards specified ensure that the effects on the environment remain, as a minimum, the same or similar as exist currently.</li> <li>Provides a recognised means of compliance by way of the TCC CHEPA Building Guidelines so that residents and potential developers do not need to go to the expense of providing a new assessment for each application regardless of scale.</li> </ul>
Efficiency	Efficient as it provides for a range of activities to be undertaken without resource consent.
Effectiveness	Effective as it clearly identifies the limits that apply to permitted activities so that the scale and intensity of the activities remains the same or similar.
Appropriateness	Appropriate as a means of sustainably managing activities in the CHEPA, implementing Policies 8.3.3.1.2, 8.3.3.1.3 and 8.3.3.1.10-12 (inclusive) and achieving the objective of avoiding, remedying or mitigating damage to land, structures and the environment from coastal erosion and inundation.

**Restricted Discretionary Activity Rules**

<i>Summary of costs</i>	<i>Limits the potential development of the site by restricting the types of activities considered.</i>
<i>Summary of benefits</i>	<ul style="list-style-type: none"> <li>Clearly identifies the activities that require resource consent that, provided they meet the specified standards, are likely to be granted consent.</li> <li>Differentiates between the CERZ and the 50-year and 100-year Erosion Risk Zones where the risk of coastal erosion and inundation is correspondingly less.</li> <li>Provides for consideration of activities that meet the specified standards and terms without requiring written approvals or the service of notice on other parties.</li> </ul>
<i>Efficiency</i>	<i>Efficient as it provides for activities to be considered without written approval or the service of notice insofar as they relate to coastal erosion and inundation matters.</i>
<i>Effectiveness</i>	<i>Effective as the rule clearly states the activities that may be considered.</i>
<i>Appropriateness</i>	<i>Appropriate as a means of sustainably managing activities in the CHEPA, implementing Policies 8.3.3.1.1 – 12 (inclusive) and achieving the objective of avoiding, remedying or mitigating damage to land, structures and the environment from coastal erosion and inundation.</i>

**Restricted Discretionary Activities - Matters of Discretion and Conditions**

<i>Summary of costs</i>	<i>Requires application to be made for activities in the CHEPA and may thus restrict development opportunities in the area.</i>
<i>Summary of benefits</i>	<ul style="list-style-type: none"> <li>The rule clearly identifies the information required to enable a restricted discretionary activity in the CHEPA to be fully assessed. This information is in addition to the additional requirements of the City Plan.</li> <li>The rule provides for the use of the TCC CHEPA Building Guidelines as a means of compliance reducing the potential costs of application.</li> <li>The rule clearly identifies what the desired outcome is by providing special standards and terms for activities within the 50-year and 100-year Erosion Risk Zones.</li> <li>The rule identifies the matters over which Council holds discretion so the residents, developers and processing staff understand the intent of the rule to maintain and enhance the buffering capacity of the foredune system.</li> <li>The rule identifies conditions that may be imposed to provide certainty of outcome to residents and developers.</li> <li>The rule provides for consideration of new information where this is available.</li> </ul>
<i>Efficiency</i>	<i>Efficient as the rule provides a means of compliance that meet the objectives and policies of the Plan and would allow most applications for Restricted Discretionary Activities to be processed quickly.</i>
<i>Effectiveness</i>	<i>Effective as the rule is specific in its desired inputs and outcome. A controlled activity by comparison would not be effective as Council is required to grant consent to a controlled activity thus eliminating the potential for Council to decline an activity that does not meet the objectives and policies of the Plan.</i>
<i>Appropriateness</i>	<i>Appropriate as a means of sustainably managing activities in the CHEPA, implementing Policies 8.3.3.1.1-10 (inclusive), 8.3.3.1.11 and 8.3.3.1.13 and achieving the objective of avoiding, remedying or mitigating damage to land, structures and the environment from coastal erosion and inundation.</i>

### Non-Complying Activity Rules

Summary of costs	<i>May restrict potential development opportunities where dwellings remain within the CHEPA.</i>
Summary of benefits	<ul style="list-style-type: none"> <li><i>Provides opportunity for activities not listed to be considered by way of application subject to either compliance with the objectives and policies of the District Plan or having a minor effect on the environment.</i></li> <li><i>Clearly identifies that Council considers that such activities are not appropriate in areas that may be subject to coastal erosion and inundation.</i></li> <li><i>Encourages the relocation of buildings and activities away from the CHEPA.</i></li> </ul>
Efficiency	<i>Effective as it provides a clear indication of Council’s position on activities that have been considered as not being appropriate in the CHEPA and CPA. The default activity status in the remainder of the Plan is “Discretionary”. It is not appropriate for activities that are not listed as permitted, limited discretionary or prohibited in the CHEPA to default to discretionary as they may be deemed to be appropriate when they are unlikely to meet the objective of avoiding, remedying or mitigating damage to land, structures and the environment from coastal erosion and inundation.</i>
Effectiveness	<i>Efficient as it provides a means of allowing any application to be made, other than for activities that are prohibited.</i>
Appropriateness	<i>Appropriate as a means of sustainably managing activities in the CHEPA, implementing Policies 8.3.3.1.1-13 (inclusive) and achieving the objective of avoiding, remedying or mitigating damage to land, structures and the environment from coastal erosion and inundation.</i>

### Prohibited Activity Rules

Summary of costs	<i>Restricts development opportunities in the CHEPA.</i>
Summary of benefits	<ul style="list-style-type: none"> <li><i>Clearly identifies activities that are not allowed in the CHEPA.</i></li> <li><i>Establishes a limit on the potential development, and thus the risk to that development, in areas subject to coastal erosion and inundation.</i></li> <li><i>Provides for the maintenance and enhancement of the buffering capacity of the foredune by not allowing increased levels of development.</i></li> </ul>
Efficiency	<i>Efficient as residents and developers are left with no doubt that the activities prohibited cannot be granted consent.</i>
Effectiveness	<ul style="list-style-type: none"> <li><i>Effective as it establishes a limit to the development of the area at risk from coastal erosion and inundation.</i></li> <li><i>Effective as it avoids development in the CHEPA thus meeting the objective.</i></li> <li><i>Effective as it encourages “managed retreat” .</i></li> </ul>
Appropriateness	<i>Appropriate as a means of sustainably managing activities in the CHEPA, implementing Policies 8.3.1.1.1-6 (inclusive) and 8.3.1.1.9 and achieving the objective of avoiding, remedying or mitigating damage to land, structures and the environment from coastal erosion and inundation.</i>

**Changes to Coastal Hazard Maps, Plan Maps (Part B)**

<i>Summary of costs</i>	<i>Potential for change to disadvantage properties on a site-by-site consideration of the location of the hazard boundaries. Consideration of the proposed change has identified 11 new properties now covered by the 100 year line, however no further properties are worse off following the change.</i>
<i>Summary of benefits</i>	<ul style="list-style-type: none"> <li><i>Provides for the most recent data to be applied to determining the location of the boundaries within the CHEPA.</i></li> </ul>
<i>Efficiency</i>	<i>Efficient as the Planning Maps are an easy tool to use and easily understood by residents and landowners.</i>
<i>Effectiveness</i>	<i>Effective as it provides certainty for users of the Plan so they can rely on the data provided.</i>
<i>Appropriateness</i>	<i>Appropriate as a means of sustainably managing activities in the CHEPA, implementing Policies 8.3.1.1-13 (inclusive) and achieving the objective of avoiding, remedying or mitigating damage to land, structures and the environment from coastal erosion and inundation.</i>

### 4.6.3 Monitoring Proposed Plan Provisions

ERE	Indicator	Evaluation of Plan Effectiveness
<p>Avoidance of subdivision, use and development in areas subject to natural hazards, where these hazards where the effects cannot be avoided or mitigated.</p>	<p>Projected Sea Level Rise</p>	<p>Uses the 5 yearly IPCC estimates of expected sea-level rise applied to New Zealand's and specifically Tauranga's open coastline and harbour areas, from available literature and data on the Moturiki tide gauge.</p> <p>Sea-level rise, as a result of climate change, has significant potential impacts on the coastal and harbour margins of Tauranga District. It is important to plan for this event and to keep track of any trends (increases) in sea-level rise and local future projections.</p>
<p>Avoidance of subdivision, use and development in areas subject to natural hazards, where these hazards where the effects cannot be avoided or mitigated.</p>	<p>Change in Sand Volumes on Coastal Beaches</p>	<p>Assesses changes in beach volumes at the 6 CCS profile sites and 12 additional sites within the open coast, from data collected quarterly by Environment BOP.</p> <p>The coastal margins of Tauranga District are relatively dynamic. EBOP currently monitor several sites along the open coast and from these sites various calculations are made.</p>

#### 4.7 Issue – Development within Areas Subject to Harbour Inundation

Low lying areas adjacent to the inner harbour are susceptible to inundation from the harbour. The hazard itself gives rise to a number of adverse effects to both physical and built environments, including:

- Flooding of individual properties, and damage to possessions; and
- Damage to infrastructure and network utilities.

The threat to human life associated with flooding is not historically a significant consideration within Tauranga.

#### Objectives

This table identifies the appropriateness of the listed objectives in achieving the purpose of the RMA.

Objective Number	Objective	Appropriateness
8.9.1.1	<p><i>Objective – Avoidance of Flood Prone Areas</i></p> <p><i>The adverse effects to property and the environment from flooding caused by harbour inundation are avoided.</i></p>	<p><i>It is considered that the proposed Objective is the most appropriate way to achieve the purpose of the Act for the following reasons:</i></p> <ul style="list-style-type: none"> <li>• <i>The Council, having identified a resource management issue of the adverse effects of development in areas subject to flood hazard within low lying areas around the harbour. Council is required by Section 31(b) which states that every territorial authority has as a function to control any actual or potential effects of the use, development, or protection of land, including for the purpose of the avoidance or mitigation of natural hazards.</i></li> <li>• <i>The Objective defines the actions necessary to achieve the desired environmental outcome. That action is the avoidance of damage on activities, buildings and structures within the Flood Hazard Plan Area resulting from the natural processes associated with storm events. These actions are identified in section 5 as an integral element of sustainable management (s.5(2)(c).</i></li> <li>• <i>The Objective correctly identifies that the preferred option is to avoid areas subject to flood hazard. Associated policies provide for the means of mitigation (where avoidance is not practical).</i></li> </ul>

Objective 8.9.1.1 is addressed through Policy 8.9.1.1.1. This policy is to be achieved through:

- Rule 6.4 and 6.5, relating to the activity status that applies to activities within the Flood Hazard Plan Area.

#### 4.7.1 Policies, Methods and EREs

<i>Policies and Methods</i>	<i>8.9.1.1.1 Policy – Avoidance of Flood Prone Areas By ensuring subdivision, use and development in flood-prone areas is avoided, unless: (i) the risk from flooding to buildings, structures and surrounding properties is mitigated against; and/or (ii) the natural functioning of flood plains or low lying land as ponding areas is protected.</i>
<i>Costs</i>	<i>Potential costs of damage sustained by allowing buildings and activities to remain within areas subject to Harbour Inundation.</i>
<i>Benefits</i>	<i>Clearly identifies the actions necessary to achieve the Objective.</i>
<i>Risk</i>	<i>The Risk of not acting is high in that Council has undertaken extensive studies of the potential current risks as well as the potential future risks for harbour inundation in low lying areas around the harbour. The outcome of these studies is that there are areas around Tauranga Harbour that are potentially subject to either current or future inundation hazard. The underlying science identifying the potential harbour inundation hazard was utilised in identifying the flood hazard risk in the Operative District Plan. The same methodology has been utilised using more up-to-date information and data to refine the existing floodable areas. Sufficient and certain information is therefore available to justify the Council acting in response to the resource management issue identified and continuing with this current approach.</i>
<i>Efficiency</i>	<i>Efficient in identifying a direction for development that will, on implementation, avoid the risk of harbour inundation over a 100 year time frame.</i>
<i>Effectiveness</i>	<i>Effective by emphasising mitigation (through raising land to minimum levels) as the preferred management method to achieve long-term sustainable management of areas prone to flood hazard.</i>
<i>Appropriateness</i>	<i>Appropriate as a long-term solution that would achieve the objective and increase resilience of buildings and activities in the CHEPA against damage from coastal erosion and inundation.</i>

<i>Alternative 1 – Complete avoidance through zoning an/or Landuse controls through the City Plan</i>	<i>It is that the complete avoidance of development and activity on low lying areas adjacent to the harbour and estuaries would reduce the flood hazard to zero, however this is not a reasonable option given the land ownership pattern within these areas and existing development rights afforded by the Operative District Plan.</i>
<i>Alternative 2 – Event prevention through the construction of structure capable of protecting property and/or areas from flood events</i>	<i>The construction of flood protection works such as stop banks is unlikely to be an option for the control of flooding in existing urban areas because of the relative cost (and land acquisition issues) and the extent of the identified flood prone area.</i>

### Evaluation of Rules

<i>Summary of costs</i>	<i>Limits the potential for permitted development that may otherwise be permitted in the identified zones.</i>
<i>Summary of benefits</i>	<i>The description of specific permitted activities in the Flood Hazard Plan Area provides certainty in the administration of the Plan. The activities provided describe a range of public and private activities at a level that ensures an equitable balance between the two sectors. Both public and private users are limited to the same scale and intensity of activity while the types of activity ensure that the character of the area is maintained.</i>
<i>Efficiency</i>	<i>Efficient as providing more clearly for permitted activities reduces the need for resource consent approval for minor works.</i>
<i>Effectiveness</i>	<i>Effective as it ensures that development in areas subject to harbour inundation is sustainably managed while providing for the reasonable use and development of land that maintains the same or similar scale and intensity as exists.</i>
<i>Appropriateness</i>	<i>Appropriate as a means of sustainably managing activities in the Flood Hazard Plan Area, implementing Policy 8.9.1.1.1 and achieving the stated Objective.</i>

### Permitted Activity Rules

<i>Summary of costs</i>	<i>Limits the potential for development that may otherwise be permitted in the identified zones.</i>
<i>Summary of benefits</i>	<ul style="list-style-type: none"> <li>• <i>The provision of specific standards for permitted activities ensures that the anticipated environmental outcome is achieved.</i></li> <li>• <i>Providing standards for both public and private works on residential and on conservation and recreation zoned land ensures that the scale and intensity of all works permitted in the Flood Hazard Plan Area is maintained.</i></li> <li>• <i>The standards specified ensure that the effects on the environment remain, as a minimum, the same or similar as exist currently.</i></li> </ul>
<i>Efficiency</i>	<i>Efficient as it provides for a range of activities to be undertaken without resource consent.</i>
<i>Effectiveness</i>	<i>Effective as it clearly identifies the limits that apply to permitted activities so that the scale and intensity of the activities remains the same or similar.</i>
<i>Appropriateness</i>	<i>Appropriate as a means of sustainably managing activities in the Flood Hazard Plan Area, implementing Policy 8.9.1.1.1 and achieving the stated Objective.</i>

### Restricted Discretionary Activity Rules

<i>Summary of costs</i>	<i>Limits the potential development of the site by restricting the types of activities considered.</i>
<i>Summary of benefits</i>	<ul style="list-style-type: none"> <li>• <i>Clearly identifies the activities that require resource consent that, provided they meet the specified standards, are likely to be granted consent.</i></li> <li>• <i>Provides for consideration of activities that meet the specified standards and terms.</i></li> </ul>
<i>Efficiency</i>	<i>Efficient as it provides for activities to be considered based upon meeting the specified standards and terms</i>
<i>Effectiveness</i>	<i>Effective as the rule clearly states the activities that may be considered.</i>
<i>Appropriateness</i>	<i>Appropriate as a means of sustainably managing activities in the Flood Hazard Plan Area, implementing Policy 8.9.1.1.1 and achieving the stated Objective.</i>

### Restricted Discretionary Activities - Matters of Discretion and Conditions

<i>Summary of costs</i>	<i>Requires application to be made for activities in the Flood Hazard Plan area and may thus restrict development opportunities in the area.</i>
<i>Summary of benefits</i>	<ul style="list-style-type: none"> <li>• <i>The rule clearly identifies the information required to enable a restricted discretionary activity in the Flood Hazard Plan Areas to be fully assessed. This information is in addition to the additional requirements of the City Plan.</i></li> <li>• <i>The rule clearly identifies what the desired outcome is by providing special standards and terms for activities within the Flood Hazard Plan Area.</i></li> <li>• <i>The rule identifies the matters over which Council holds discretion so the residents, developers and processing staff understand the intent of the rule.</i></li> <li>• <i>The rule identifies conditions that may be imposed to provide certainty of outcome to residents and developers.</i></li> <li>• <i>The rule provides for consideration of new information where this is available.</i></li> </ul>
<i>Efficiency</i>	<i>Efficient as the rule provides a means of compliance that meet the objectives and policies of the Plan and would allow most applications for Restricted Discretionary Activities to be processed quickly.</i>
<i>Effectiveness</i>	<i>Effective as the rule is specific in its desired inputs and outcome. A controlled activity by comparison would not be effective as Council is required to grant consent to a controlled activity thus eliminating the potential for Council to decline an activity that does not meet the objectives and policies of the Plan.</i>
<i>Appropriateness</i>	<i>Appropriate as a means of sustainably managing activities in the Flood Hazard Plan Area, implementing Policy 8.9.1.1.1 and achieving the state Objective of avoiding, remedying or mitigating damage to land, structures and the environment from coastal erosion and inundation.</i>

### Changes to Coastal Hazard Maps, Plan Maps (Part B)

<i>Summary of costs</i>	<i>Potential for change to disadvantage properties on a site-by-site consideration of the location of the hazard boundaries.</i>
<i>Summary of benefits</i>	<i>Provides for the most recent data to be applied to determining the location of the boundaries of the Flood Hazard Plan Area.</i>
<i>Efficiency</i>	<i>Efficient as the Planning Maps are an easy tool to use and easily understood by residents and landowners.</i>
<i>Effectiveness</i>	<i>Effective as it provides certainty for users of the Plan so they can rely on the data provided.</i>
<i>Appropriateness</i>	<i>Appropriate as a means of sustainably managing activities in the Flood Hazard Plan area, implementing Policy 8.9.1.1.1.</i>

In relation to harbour inundation of low-lying areas around the margins of Tauranga Harbour, land below the design storm level as assessed using the criteria in the Regional Coastal Environment Plan, proposed to be 2.5 to 2.9 metres (Moturiki Datum) is identified and mapped through the Council's Geographic Information System (GIS). These levels are applied as either the minimum ground level, or alternatively minimum building platform or floor levels for development within potential inundation areas. The flood hazard risk to development from storm surge is required to be avoided, remedied or mitigated by either achieving these levels or through alternative mitigation methods, as determined at the time of subdivision or land use consent.

Given the risk of flooding in these low-lying areas, subdivision is a restricted discretionary activity, however all activities must comply w. Effects of flooding on individual buildings and structures is also addressed through the Building Act 1991, the performance criteria of the Building Code relating to surface water, and general earthworks provisions of the Plan (refer Chapter 4 – General Rule: Earthworks). Areas of flooding associated with rainfall events and watercourses are not specifically mapped or described in the district plan. They are addressed at the time of building consent and any land use or subdivision consent requirements using available information.

During the review of the District Plan, Council has undertaken two studies on harbour inundation and harbour incursion. The outcomes of those studies are discussed in the background study section of this report.

#### 4.7.2 Monitoring Proposed Plan Provisions

ERE	Indicator	Evaluation of Plan Effectiveness
<p>Avoidance of subdivision, use and development in areas subject to natural hazards, where these hazards where the effects cannot be avoided or mitigated.</p>	<p><i>Variation Between Storm Surge and High-Tide Levels for Tauranga Harbour</i></p>	<p>Looks at the effect of storm events on sea levels within the harbour, by comparing annual maxima events at the Tug Berth tide gauge with high tide levels. Over time this will confirm low-lying harbour margin land at risk from storm surge inundation.</p> <p>Until such time as global warming elevates average tide levels the most “visible” way of presenting risk of coastal flooding data is as a level above average high tide. People can imagine this and the data presented shows this</p> <p>The indicator is designed to indicate pressure on the environment and is derived from several external sources.</p>
<p>Avoidance of subdivision, use and development in areas subject to natural hazards, where these hazards where the effects cannot be avoided or mitigated.</p>	<p><i>Projected Sea Level Rise</i></p>	<p>Uses the 5 yearly IPCC estimates of expected sea-level rise applied to New Zealand’s and specifically Tauranga’s open coastline and harbour areas, from available literature and data on the Moturiki tide gauge.</p> <p>Sea-level rise, as a result of climate change, has significant potential impacts on the coastal and harbour margins of Tauranga District. It is important to plan for this event and to keep track of any trends (increases) in sea-level rise and local future projections.</p>
<p>Avoidance of subdivision, use and development in areas subject to natural hazards, where these hazards where the effects cannot be avoided or mitigated.</p>	<p><i>Number and Size of Land Parcels in Flood Risk Areas Compared with Non-Risk Areas</i></p>	<p>Assesses changes in the number of properties at risk from flooding (1 in 50 year rainfall event), to see the amount and type of development that may be occurring within these areas.</p> <p>By evaluating the number of parcels in areas that are prone to flooding a picture may emerge of the level of risk the community is exposed to. It is assumed that flood prone areas should be on average larger than non-flood prone land, or that the trend in parcel size will at least be</p>

		<i>towards a larger size (ie – TCC will not always seek an engineered solution to flooding).</i>
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## **4.8 Issue – Risk to Life and Property from Low Probability/High Risk Natural Hazards**

### **Earthquakes**

The potential impacts of earthquakes are dependent upon the size and nature of the earthquake. Damage to buildings and infrastructure can result from a number of related mechanisms, including:

- Violent ground shaking;
- Potential liquefaction of saturated soils and differential settlement;
- Rockfall and landslips; and
- Tsunamis and coastal inundation.

### **Volcanic Activity**

The potential impacts of volcanic hazard on Tauranga are likely to result primarily in damage from ash falls to buildings and to infrastructure including:

- Electricity generation and the wider reticulation system;
- The telecommunications network;
- Water supplies, sewage and drainage;
- Transport infrastructure;
- Hospitals;
- Structural damage from weight of ash deposits.

### **Tsunami**

The potential impacts of tsunami vary depending on intensity. For the Bay of Plenty regional, Environment Bay of Plenty has commissioned reports to develop a credible tsunami hazard profile for the Bay of Plenty. A further study was undertaken for the Wairakei/Te Tumu area as part of the Structure Plan process for Te Tumu. This identified that the most credible 'worse case scenario' for tsunami inundation of the Wairakei/Te Tumu development areas, generating waves with a run up of up to 4.2m along the seaward coast of the study area. These reports are referred to in the background studies of this report, and are available from Environment Bay of Plenty.

### **Management Strategy – outside of the City Plan**

Given the low probability, however high risk of the aforementioned Natural Hazards the most appropriate management strategy is to deal with these potential events through preparedness to adequately deal with the adverse impacts once they have occurred. It is not considered appropriate for the District Plan to manage these events. Specifically for earthquake events, the effects to buildings can be managed through the relevant Building Act 2004 provisions.

<p><i>Alternative 1 – Identify and map High Risk/Low Probability Hazards in the City Plan</i></p>	<p><i>There are few practical high risk/low probability hazard management issues which can be addressed directly the City Plan. Provisions aimed at minimising risks from land instability generally will, however, also reduce risks associated with earthquakes, however is dealt with through the subdivision and building processes (along with associated Objectives and Polices for land instability).</i></p> <p><i>There is limited science to identify where these events will occur, and the overall effects of these that could be managed through the District Plan. Rather, a more appropriate management response is through preparedness and education through Civil Defence.</i></p> <p><i>Given that the effects of such as event will more than likely be on a regional scale, it is considered that any overall management framework within the RMA should be dealt with by Environment Bay of Plenty.</i></p>
<p><i>Alternative 2 – Do Nothing</i></p>	<p><i>This alternative does not meet the requirements of the RMA, in particular Section 31(b).</i></p>

## **5. RECOMMENDED OBJECTIVES, POLICIES AND METHODS**

The recommended plan content is to utilise the existing provisions of the Operative District Plan, and as they are still relevant refine those based upon the drafting guidelines for the Tauranga City Plan. Studies on Natural Hazard identification have been undertaken over a number of years, with specific studies geared toward testing the existing operative methods against the previous models and new information gained through other sources, such as the Ministry for the Environment.

Council has a clear function under Section 31(b) to control of any actual or potential effects of the use, development, or protection of land, including for the purpose of the avoidance or mitigation of natural hazards.

The Objectives, Polices and Methods seek to do this, through an overall philosophy of avoiding hazards, and a reduction in net vulnerability.

Objectives and Polices are recommended to manage:

- The avoidance of Compressible and Liquefiable Soils;
- The avoidance of Areas of Land Instability;
- Protection of Natural Ecosystems; and
- The Protection of the Coastal Environment.

Objectives, Polices and Rules (including identifying areas subject to natural hazards) have been developed for:

- Areas subject to Coastal Erosion and Inundation; and
- Areas subject to Harbour Inundation.

These recommended approach (for Coastal Erosion and Inundation) has been tested through the Environment Court, and found to be an appropriate method.

## **6. NOTIFICATION AND RECOMMENDED DECISIONS**

*This section to be completed following hearings.*