

Planning Evidence and Recommendations Report

***Horizons Regional Council's Planning Officer's
Report on Submissions to the
Proposed One Plan – Natural Hazards***



February 2009

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INTRODUCTION

CHAPTER 10: NATURAL HAZARDS

*This report contains the recommendations from Horizons Regional Council's Planning Officers on submissions to the Proposed One Plan. These recommendations are **NOT** Council recommendations or final decisions.*

Horizon Regional Council's Proposed One Plan was notified on Thursday 31 May 2007. The closing date to lodge submissions on the document with Horizons Regional Council was Friday 31 August 2007; late submissions were accepted through to Sunday 30 September 2007. Further submissions were accepted from 17 November 2007 through to Wednesday 19 December 2007.

During the submission period 467 submissions and 62 further submissions were received from individuals (314), organisations/companies (149), iwi (18), Territorial Authorities (15), interest groups (10), Central Government organisations (19), District Health Boards (2) and Regional Councils (2). The submissions addressed a large number of matters in the Proposed One Plan and associated Section 32 Report. This document is the Planning Evidence and Recommendations Report; it contains the recommendations made by Horizons Regional Council's Planning Officers to the Hearings Panel, having considered the submissions received to the Proposed One Plan.

The submissions and further submissions to the Proposed One Plan have been assessed by Horizons Regional Council's Planning Officers having regard to:

- The One Plan philosophy and intent
- Section 32 Report
- Technical evidence
- Resource Management Act responsibilities
- Case law

Horizons Regional Council staff met with some submitters to clarify points raised or negotiate potential outcomes, and they sought advice from technical advisors as appropriate. As noted in the readers guide, the recommendations on submissions do not have any statutory weight. Instead, they are intended to assist the Hearing Panel to (a) consider the merits of the Proposed One Plan in light of submissions received and (b) assist submitters by setting out responses to the points raised.

Part Four presents the evaluation of submissions along with the technical and planning evidence considered by the Horizons Regional Council Planning Officers in making recommendations to the Hearing Panel. Tables are presented showing whether a submission point has been accepted, accepted in part or rejected as a consequence of these recommendations. Accept in part means that only part of the decision requested in that submission has been recommended to be accepted. Unless detailed otherwise where the primary submission has been accepted it follows that the further submissions supporting the primary submission have been accepted, and that the further submissions opposing the primary submitter have been rejected.

PART ONE: READERS' GUIDE

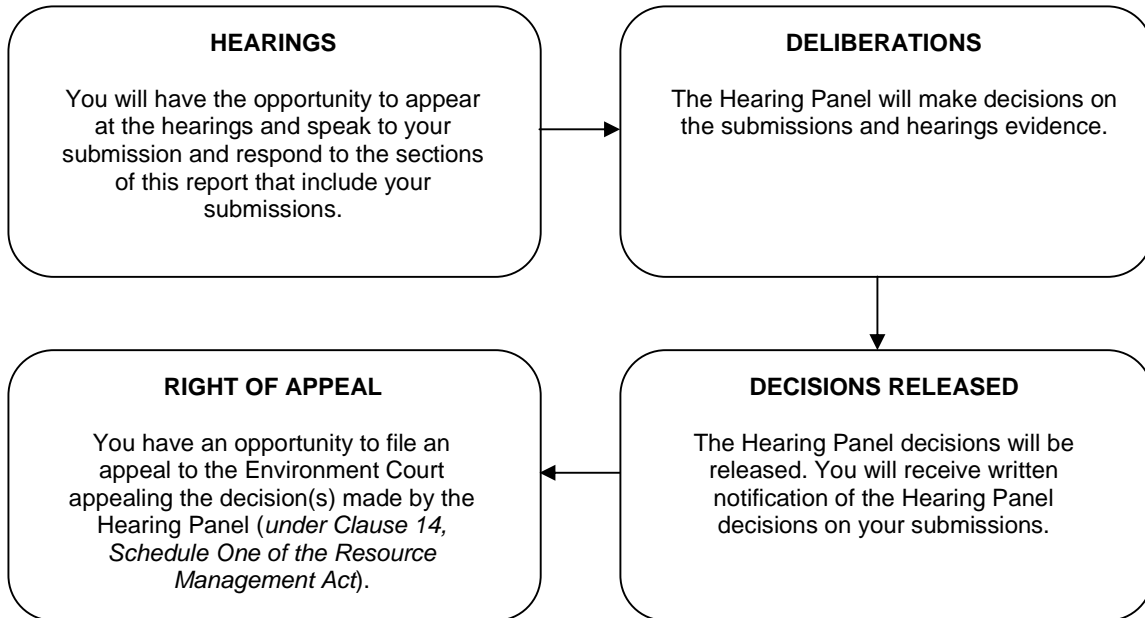
1.1 Structure of Report

The Planning Evidence and Recommendations Report on submissions relating to Chapter 10: Natural Hazards is structured as follows:

- Part 1 Readers' guide
- Part 2 Statement of qualifications and experience
- Part 3 Summary of key themes and recommendation
 - Provides a summary of the key submission themes and recommendations relating to Chapter 10: Natural Hazards
- Part 4 Recommendations on submissions on Chapter 10: Natural Hazards of the Proposed One Plan; includes tables indicating whether a submission point be accepted, accepted in part or rejected as a consequence of the Horizons Regional Council's Planning Officers' recommendation. The technical and planning assessment is presented along with the Planning Officers' evaluation, recommendation and wording changes to implement that recommendation:
 - 4.1 Chapter 10 General
 - 4.2 Chapter 10 Paragraph 10.1 Scope and background
 - 4.3 Chapter 10 Issue 10-1 and Objective 10-1 Effects of natural hazard events
 - 4.4 Chapter 10 – Policy – General
 - 4.5 Chapter 10 – Policy 10-1 Responsibilities for natural hazard management
 - 4.6 Chapter 10 – Policy 10-2 Development in areas prone to flooding
 - 4.7 Chapter 10 – Policy 10-3 Activities that need to be located in areas prone to flooding
 - 4.8 Chapter 10 – Policy 10-4 Critical infrastructure
 - 4.9 Chapter 10 – Policy 10-5 Other types of natural hazards
 - 4.10 Chapter 10 – Policy 10-6 Climate change
 - 4.11 Chapter 10 – Method – Hazards research
 - 4.12 Chapter 10 – Method - Floodable areas research
 - 4.13 Chapter 10 – Method - Natural hazard information and advice
 - 4.14 Chapter 10 – Method - Public information - natural hazards
 - 4.15 Chapter 10 – Anticipated Environmental Result – Table 1, Row 1
 - 4.16 Chapter 10 – Anticipated Environmental Result – Table 1, Row 2
 - 4.17 Chapter 10 – Explanations and principal reasons
 - 4.18 Glossary – Term – Critical infrastructure
 - 4.19 Glossary – Term – Floodway
 - 4.20 Schedule I – General
 - 4.21 Schedule I – Figure I:3 Taonui Basin Spillway

1.2 Process from here – notes for submitters

This Hearing Evidence Report has been written to assist the Hearing Panel in the decision-making process. The process for the decision-making is set out below for the information of submitters:



PART TWO: STATEMENT OF QUALIFICATIONS AND EXPERIENCE

My full name is Phillip Harry Percy. I have a Bachelor of Resource and Environmental Planning with honours degree (specialisation in physical geography) from Massey University. I have been practising as a planner for more than 10 years. This has included working as a policy planner for Greater Wellington Regional Council as well as a range of senior planning positions in multidisciplinary consultancies in New Zealand. In my various roles as a planning consultant I have been involved in submissions and hearings on a range of planning documents at both regional and district level. I have significant experience as a user of planning documents through the assessment of projects and proposals and obtaining resource consents for a variety of activities, including for infrastructure and roading, discharges to land, water and air and large-scale earthworks activities. I have also worked as a Planner in the United Kingdom, including in consent processing, enforcement and monitoring roles.

I am currently director of a planning consultancy business, Perception Planning Limited, which I established in 2007.

I have been involved in the later stages of the development of the Proposed One Plan. I was involved in developing components of the provisions for managing non-point source discharges and prepared the Section 32 report prior to notification of the Proposed One Plan.

PART THREE: SUMMARY OF KEY THEMES AND RECOMMENDATIONS

The purpose of this summary is to provide an overview of the submissions received to Chapter 10 – Natural Hazards – of the Proposed One Plan (POP) and the recommendations to the Hearing Panel. Due to the significant number of submissions received and the complexity of the issues raised, the Planning Evidence and Recommendations Report is a large document and submitters may wish to have a short summary of the issues raised and the direction the Horizons Regional Council's Planner has recommended in response to each issue. The following summary attempts to provide such an overview.

Responsibilities for managing natural hazards

The Regional Policy Statement (RPS) section of the POP, of which Chapter 10 is a part, must state the significant resource management issues for the Region as well as the objectives, policies and methods to be achieved in addressing those issues (s62 of the Resource Management Act 1991 (RMA)). Through a process of consultation, including significant consultation after the 2004 flood events that affected significant parts of the Region, the management of natural hazards was identified as a significant issue to the Region. The identification of the management of natural hazards as a significant issue corresponds with the function set out in s30(1)(c)(iv) of the RMA for the Regional Council to control the use of land for the purpose of the avoidance or mitigation of natural hazards.

In addition to the requirement to state the significant issues of the Region, the POP is required by s62(1)(i)(i) to state the local authority responsible for specifying the objectives, policies and methods for the control of the use of land to avoid or mitigate natural hazards. The POP does this in Policy 10-1 by specifying the roles that both the Regional Council and Territorial Authorities will play in managing natural hazards.

The POP recognises that the management of natural hazards is generally best achieved by managing the establishment and change to land use activities, and that this is most effectively controlled at the local level through District Plans. It is recognised however that Territorial Authorities can only manage natural hazards where there is sufficient information about the location, extent and scale of natural hazard events to enable accurate land use controls to be put in place. The POP has identified that the development of information about natural hazards is often best achieved at a wider regional level, and therefore the responsibility for gathering and disseminating hazard information, including mapping, is given to the Regional Council. Submitters generally support this approach.

The transfer of information between the Regional Council and Territorial Authorities is established in the POP by way of methods, specifying which hazards require information and how that information will be presented (in many cases this will be through hazard maps).

Floodways and maps in Schedule I

Chapter 10 also recognises the important role that the Regional Council plays in managing the flood hazard through the development and management of flood and river control schemes throughout the Region. Components such as floodways are essential to the overall flood mitigation framework and these are specifically protected in Chapter 10 by expressly avoiding development in these areas except where there is a functional need. Submitters generally support the protection of floodways from development. Some changes are recommended in this report to clarify some of the confusion created through the use of different terminology between the policies and the maps in Schedule I which show the floodways to be protected. It is recommended to amend the annotations on the maps to more clearly show that they are floodways rather than spillways or floodable areas.

Avoidance versus mitigation of flood hazard

Some submitters raised concerns about the preference for avoiding development in areas that are subject to flooding rather than enabling mitigation of the hazard. The POP has been written with a preference for avoidance of the flooding hazard largely because of the difficulty of dealing with residual risk, which is the risk to a community if a mitigation measure (such as a stopbank) should fail or be overtopped. The preference for avoidance significantly reduces the residual risk to communities and limits the costs of further mitigation that future generations are likely to face to improve flood defences in light of climate change and better understanding of flood events.

However, the POP still intends that mitigation of the flood hazard is appropriate provided a list of effects is suitably addressed, including risk to human life and property. In this report, it is recommended to widen the policy stance to enable mitigation to be considered where the residual risk is managed to an acceptable level. For example, a community may wish to develop land for a new residential area in a floodable area, and provide protection from a 0.5% Annual Exceedence Probability (AEP) flood event by way of a stopbank. The recommended changes to the policies in Chapter 10 provide for that to occur provided the 'residual inundation' (which is the depth and velocity of water should the mitigation measures fail) is limited. In this way, some degree of risk is accepted, such as some damage to property and disruption to people, but major damage and risk to human life is minimal.

Critical infrastructure

Submitters sought changes to the definition of 'critical infrastructure' to include a number of other pieces of infrastructure within the definition. Because critical infrastructure is a term used only in the context of Chapter 10, and is intended to include only large and difficult-to-replace structures such as water treatment plants, it is not recommended be added to the list. There appeared to be an assumption by some submitters that 'critical infrastructure' referred to infrastructure that is addressed in Chapter 3 – Infrastructure, Energy and Waste. This is not the case and the use of the term in Chapter 10 does not afford such infrastructure any particular value other than that it be located outside hazard-prone areas.

Submitters also requested that the use of the phrase ‘and there is no reasonable alternative’ in relation to siting infrastructure in hazard-prone areas. However, this could be problematic. It is recommended to change this to provide an exception for infrastructure to be located in hazard-prone areas where there is a functional constraint which necessitates it. An example would be a new bridge, which necessarily needs to be in an area that floods because it crosses a river.

Managing climate change

Submitters, particularly Territorial Authorities, sought more specificity in the policies of Chapter 10 that relate to managing climate change. As notified, the POP requires that a precautionary approach is adopted when making decisions. On consideration, the nature of climate change and the degree of uncertainty as to how it will affect different hazards in different locations means that it is very difficult for the POP to provide specific guidance. Research and mapping for climate-influenced hazards, such as flooding and coastal erosion, can take into account current predictions for climate change. However, until this research is done, Territorial Authorities need to be precautionary when making decisions on land use proposals. This may take the form of including assessment criteria for resource consents in certain areas, or may involve precautionary setbacks being established around potentially hazardous areas, which prompt developers to undertake site-specific investigation of the hazard.

Due to the variability of information and responses, no significant changes to the current approach in the POP have been recommended. This recognises that the methods requiring natural hazard research, mapping and information dissemination to local authorities and others will greatly assist in applying a precautionary approach throughout the life of the POP.

Other matters

A range of other changes to the provisions of Chapter 10 were requested. Where these are considered to improve the accuracy, clarity or readability of the POP, changes have been recommended. Where requests constituted substantive changes that were either outside the scope of the POP or that would result in potential conflict with other Chapters in the POP, those submissions have been recommended to be rejected.

Overall structure

A number of changes have been recommended to improve the readability of Chapter 10 and to improve consistency between policies. The most significant structural change is to combine Policies 10-2 and 10-3. Policy 10-3 as notified provides an exception to Policy 10-2. As this policy only relates to Policy 10-2, it is recommended to amend Policy 10-2 to include the exception provided by Policy 10-3.

Other more minor changes have also been recommended. These include the addition of notes to each of the policies identifying which objective they relate to.

PART FOUR: RECOMMENDATIONS ON SUBMISSIONS

4.1 Chapter 10 General

Table of Submitters, Submission Points and Recommendations

Submitter	Number	Point	Decision Sought	Recommendation
SHARN HAINSWORTH	116	1	I also submit about the need for the Regional Policy Statement of the One Plan to require a forum and long term (50-100 year) plans to address issues of sustainable development, also taking natural hazards and the impact of climate change into account.	Reject
WAIKATO DISTRICT HEALTH BOARD - PUBLIC HEALTH UNIT	12	4	The Waikato DHB supports the proposal in the One Plan.	Accept in part
	X 481	3	PALMERSTON NORTH CITY COUNCIL - Oppose	Accept in part
	X 495	192	RUAPEHU DISTRICT COUNCIL - Oppose	Accept in part
	X 500	44	TARARUA DISTRICT COUNCIL - Oppose	Accept in part
	X 507	44	MANAWATU DISTRICT COUNCIL - Oppose	Accept in part
	X 515	44	HOROWHENUA DISTRICT COUNCIL - Oppose	Accept in part
	X 517	52	RANGITIKEI DISTRICT COUNCIL - Oppose	Accept in part
	X 532	44	WANGANUI DISTRICT COUNCIL - Oppose	Accept in part
G N S SCIENCE	31	17	GNS supports the re-inclusion of this Policy [Policy 10-7 from a earlier draft of the One Plan] in Chapter 10 of the One Plan, as per the March 2006 version.	Reject
G N S SCIENCE	31	20	It is recommended that any research combines the physical and social aspects of the impacts of the hazard.	Accept in part

Submitter	Number	Point	Decision Sought	Recommendation
G N S SCIENCE	31	26	GNS Science strongly supports the precautionary approach adopted for flood hazard risk	Accept
G N S SCIENCE	31	27	GNS Science strongly supports..... the One Plan natural hazards chapter recognises the potential for climate change to exacerbate meteorological hazards.	Accept
G N S SCIENCE	31	28	GNS Science supports the intent of Chapter 10 of the One Plan for the Manawatu-Wanganui region	Accept
G N S SCIENCE	31	29	GNS supports in general the Objectives, Policies and methods of the proposed One Plan, Part One, Chapter 10 - Natural Hazards section, and thanks HRC for the opportunity to comment on the content of this plan.	Accept
I C H Y T H U S CONSULTING	59	3	That Net Water Balance (NWB) criteria will be given consideration in rules and consenting criteria/conditions.	Reject
RUAPEHU DISTRICT COUNCIL	151	116	(i) Amendment of Section 10 to provide clear direction as to how TAs should be planning for sea level rise and/or climate change;	Reject
	X 481	181	PALMERSTON NORTH CITY COUNCIL - Support	Reject
RUAPEHU DISTRICT COUNCIL	151	117	(ii) Recognition of the correct interpretation and application of s5(2)(c) of the RMA.	Reject
	X 481	182	PALMERSTON NORTH CITY COUNCIL - Support	Reject
RUAPEHU DISTRICT COUNCIL	151	118	(iii) For Regional Council to provide further justification for the requirement for TAs to identify and control landuse within areas subject to 0.5% AEP inundation, or reducing the requirement to identifying areas subject to a 1.0% AEP event.	Reject
	X 481	183	PALMERSTON NORTH CITY COUNCIL - Support	Reject
RUAPEHU DISTRICT COUNCIL	151	119	(iv) Regional Council to identify Ohura as a floodable area for the purposes of the One Plan and include a map of the Ohura floodable area in Schedule 1 of the One Plan.	Accept
	X 481	184	PALMERSTON NORTH CITY COUNCIL - Support	Accept

Submitter	Number	Point	Decision Sought	Recommendation
RUAPEHU DISTRICT COUNCIL	151	120	(v) Regional Council to identify the Taumarunui Flood Protection Scheme and include a map in Schedule 1 of the One Plan.	Accept in part
	X 481	185	PALMERSTON NORTH CITY COUNCIL - Support	Accept in part
RUAPEHU DISTRICT COUNCIL	151	126	(viii) Council also submits a request for help in identifying other flood plan areas as it develops the District Plan.	Accept in part
	X 481	191	PALMERSTON NORTH CITY COUNCIL - Support	Accept in part
RUAPEHU DISTRICT COUNCIL	151	127	(ix) Regional Council to include and identify lahar pathways.	Reject
	X 481	192	PALMERSTON NORTH CITY COUNCIL - Support	Reject
TARARUA DISTRICT COUNCIL	172	58	[Particular reference to Policies 10-1, 10-2 and 10-6] - Withdraw the whole plan; or - Amend Chapter 10 to provide clear direction as to how Territorial Authorities ought to be planning for sea level rise and/or climate change; and - Recognition of the correct interpretation and application of s5(2)(c) of the Resource Management Act.	Reject
	X 481	329	PALMERSTON NORTH CITY COUNCIL - Support	Reject
RANGITIKEI AGGREGATES LTD	279	8	It is considered appropriate and necessary for gravel extraction to be mentioned in the natural hazards section of the One Plan so regard can be had to the benefits of gravel extraction as one of the control agents embedded in the Plan.	Reject
	X 504	21	HIGGINS GROUP - Support	Reject

Submitter	Number	Point	Decision Sought	Recommendation
HOROWHENUA DISTRICT COUNCIL	280	61	[Particular reference to Policies 10-1, 10-2 and 10-6] - Amend section 10 to provide clear direction as to how Territorial Authorities ought to be planning for sea level rise and/or climate change; and - Recognition of the correct interpretation and application of s5(2)(c) of the Resource Management Act.	Reject
	X 481	422	PALMERSTON NORTH CITY COUNCIL - Support	Reject
WANGANUI DISTRICT COUNCIL	291	40	[Particular reference to Policies 10-1, 10-2 and 10-6] - Withdrawal of the whole plan; or - Amendment of section 10 to provide clear direction as to how Territorial Authorities ought to be planning for sea level rise and/or climate change	Reject
	X 481	500	PALMERSTON NORTH CITY COUNCIL - Support	Reject
WANGANUI DISTRICT COUNCIL	291	41	[Particular reference to Policies 10-1, 10-2 and 10-6] - Withdrawal of the whole plan; or - Recognition of the correct interpretation and application of s5(2)(c) of the Resource Management Act.	Reject
	X 481	501	PALMERSTON NORTH CITY COUNCIL - Support	Reject
MANAWATU DISTRICT COUNCIL	340	76	[Reference to Policies 10-1, 10-2 and 10-6] Amendment of section 10 to provide clear direction as to how Territorial Authorities ought to be planning for sea level rise and/or climate change; and Recognition of the correct interpretation and application of s5(2)(c) of	Reject

Submitter	Number	Point	Decision Sought	Recommendation
			the Resource Management Act.	
	X 481	632	PALMERSTON NORTH CITY COUNCIL - Support	Reject
MANAWATU DISTRICT COUNCIL	340	80	Clarify how the stormwater design provisions of the Code of Urban Subdivision (NZS 4404) fit in with the One Plan.	Reject
	X 481	636	PALMERSTON NORTH CITY COUNCIL - Support	Reject
RANGITIKEI DISTRICT COUNCIL	346	58	[Particular reference to Policies 10-1, 10-2 and 10-6] - Amend Chapter 10 to provide clear direction as to how Territorial Authorities ought to be planning for sea level rise and/or climate change; and - Recognition of the correct interpretation and application of s5(2)(c) of the Resource Management Act.	Reject
	X 481	763	PALMERSTON NORTH CITY COUNCIL - Support	Reject
ENVIRONMENT NETWORK MANAWATU	356	39	No specific decision requested, however submitter notes: Under methods it is noted that the target for mapping these hazards is not until 2010, ENM question what the implications are for this if in the meantime development occurs in areas that are later identified by these maps as being susceptible to hazards	Reject
HORTICULTURE NEW ZEALAND	357	97	No specific decision requested but Horticulture NZ generally support the approach to management of natural hazards and initiatives that have the potential to reduce future risk.	Accept in part
J M & L C WHITELOCK & B J & C J WHITELOCK	371	9	Request - The request therefore is a reference to the progress on this matter be incorporated and a time schedule be identified for its application (it is now many months since the indicators suggested this matter was in the pipeline, so lets ensure that it becomes effective at the earliest possible date).	Reject

Submitter	Number	Point	Decision Sought	Recommendation
ENVIRONMENT WAIKATO	385	10	<p>Environment Waikato would like to support Horizons proposed approach for the management of hazards including:</p> <p>Setting a clear regional framework for natural hazard management,</p> <p>Clarification of the respective roles and responsibilities of regional and Territorial Authorities,</p> <p>Discouraging future residential development and the placement of critical infrastructure in areas prone to hazards in particular flooding, and</p> <p>The provision of information on hazards to Territorial Authorities.</p>	Accept in part
ENVIRONMENTAL WORKING PARTY	386	87	We generally endorse the Councils approach for dealing with natural hazards. However, we have...[some] comments and suggestions.	Accept in part
ENVIRONMENTAL WORKING PARTY	386	88	We ask that Council insert a new policy and/or objective within Chapter 10 to provide a cross reference to Chapter 4 (Te Ao Maori). The policies and objectives of Chapter 4 are important to, and interlinked with, policies and objectives throughout the rest of the Plan. We encourage this approach so that Maori issues and perspectives on environmental management are not isolated to Chapter 4, but made relevant and meaningful through all aspects of the One Plan.	Reject
NGA PAE O RANGITIKEI	427	87	We generally endorse the Councils approach for dealing with natural hazards. However, we have...[some] comments and suggestions.	Accept in part
NGA PAE O RANGITIKEI	427	88	We ask that Council insert a new policy and/or objective within Chapter 10 to provide a cross reference to Chapter 4 (Te Ao Maori). The policies and objectives of Chapter 4 are important to, and interlinked with, policies and objectives throughout the rest of the Plan. We encourage this approach so that Maori issues and perspectives on environmental management are not isolated to Chapter 4, but made relevant and meaningful through all aspects of the One Plan.	Reject

4.1.1 Submission Summary

- (a) Submitters generally support the approach to management of natural hazards in the POP.
- (b) Submitters request clarification of the target date of 2010 in the methods for hazard mapping and what the implications for management of hazards in the interim is.
- (c) Submitters seek clearer cross-references within the Hazards chapter to the Te Ao Maori chapter and inclusion of other specific matters to be taken into account when managing natural hazards.
- (d) GNS Science requests that research combines the physical and social aspects of natural hazards.
- (e) Several Territorial Authority submitters request clearer direction within the POP as to how they should be managing the issues of sea level rise and climate change.
- (f) Submitter requests clarification of the correct interpretation of s5(2)(c) of the Act.
- (g) Horticulture NZ requests the inclusion of a method to support initiatives that increase understanding and risk management to assist in risk reduction.
- (h) Submitter requests clarification of how the Code for Urban Subdivision (NZS:4404) relates to the POP.
- (i) Submitter requests that greater recognition of the role that gravel extraction plays in flood hazard management is included in the POP.
- (j) Submitters request clarification as to why the 0.5% AEP flood limit has been used in the POP as the level to which Territorial Authorities are expected to manage land uses.
- (k) Submitters request that specific areas or sites be included on the maps in Schedule I, including Ohura and the Taumarunui Flood Protection Scheme, district drainage schemes and the Taonui Basin Spillway (Horizons Regional Council).
- (l) Ruapehu District Council requests that lahar flow paths are identified in the POP.
- (m) Submitter requests that the POP include a requirement for a long-term planning forum to be established to consider sustainable management issues such as climate change.
- (n) Submitters seek clarification of the terms 'floodway' and floodable areas'.
- (o) Submitters request that the maps in Schedule I be produced at a better scale to allow easier use.
- (p) Submitters request that a policy be provided detailing the approach to be taken when considering coastal protection works below mean high water springs.
- (q) Submitters request including reference to the Net Water Balance in rules and assessment criteria.

4.1.2 Evaluation

- (a) Generally, I accept the submission points of submitters supporting the overall approach to managing natural hazards in the One Plan. Throughout this report I make a number of recommended changes to specific provisions but these changes do not alter the overall approach as notified.

- (b) The date established in the Hazard Research and Floodable Areas Research methods recognises that there is a significant resourcing issue associated with researching and mapping hazards. Hazards that require models to be built for predictive purposes, such as flooding, are costly to produce and require significant human and technology resources. The target date of 2010 has been set in recognition of the capability of Horizons Regional Council to undertake the mapping work. Peter Blackwood, a river engineer for Horizons, provides an overview of the technicalities of flood hazard prediction and mapping in his evidence. It is noted that hazard investigations and the provision of maps and information will be undertaken in a progressive manner and therefore Territorial Authorities will be provided with the most up-to-date information at the time it is available (which may be before 2010).
- (c) The date established in the Hazard Research and Floodable Areas Research methods recognises that there is a significant resourcing issue associated with researching and mapping hazards. Hazards that require models to be built for predictive purposes, such as flooding, are costly to produce and require significant human and technology resources. The target date of 2010 has been set in recognition of the capability of Horizons Regional Council to undertake the mapping work. Peter Blackwood, a river engineer for Horizons, provides an overview of the technicalities of flood hazard prediction and mapping in his evidence. It is noted that hazard investigations and the provision of maps and information will be undertaken in a progressive manner and therefore Territorial Authorities will be provided with the most up-to-date information at the time it is available (which may be before 2010).

Where there is currently no or limited mapping for natural hazards in the Region, councils must continue to plan and make decisions based on the best information available. The complexity of hazard research and mapping means that information improves over time. This is a function of greater resources being applied to research and mapping, but also better opportunities for data collection. Events such as the 2004 storms provide excellent opportunities for models to be tested and the extent of flooding and flood flow characteristics to be more accurately recorded. Over time, as more events occur, the opportunities for validating and improving the extent and accuracy of information will increase. The methods in Chapter 10 recognise this development of information over time but also put in place a time limit for developing a base set of maps where none exist at present.

- (d) As has been discussed in officers' reports in several other chapters (Land, Coast, etc), the existing framework of the POP provides for linkages between the Regional Plan (RP) and Regional Policy Statement (RPS) components of the document. This is either directly via specific reference to objectives and policies, or is required as part of the resource consent decision-making process under s104 of the RMA, which requires decision-makers to 'have regard to' and relevant provisions of a Regional Plan or Regional Policy Statement. The details of a particular proposal will require consideration of relevant provisions of the POP, which in some cases will include the provisions of the Te Ao Maori chapter. Territorial authorities also have to 'have regard to' a proposed Regional Policy Statement and 'give effect to' an operative

Regional Policy Statement through their District Plans (s74 and s75 of the RMA). It is therefore considered that the RMA requirements already provide a degree of connection between the RPS and RP components of the POP.

- (e) The request from GNS Science to incorporate both the physical and social aspects of the effects of natural hazards is considered consistent with the purpose of the Act and is largely fundamental to determining the 'risk' associated with the hazards that are being managed. The risk of a natural hazard incorporates the physical characteristics of the natural event with the impact that the event may have on individuals, communities and the rest of the environment. It is therefore recommended to amend Issue 10-1 to refer to the social, economic and cultural well-being of individuals and communities as well as the natural and physical resources that people rely on. Further discussion and recommended changes to the POP are included in Section 3.3 of this report.
- (f) In relation to Policy 10-6, submitters (Territorial Authorities) request that the POP provide more specific guidance as to management of sea level rise and the implications of climate change, particularly in the interim when the Regional Council does not have detailed information about the effects or extent of coastal hazards including sea-level change. This matter is discussed in Section 4.10 of this report, which addresses Policy 10-6 specifically.
- (g) Submissions 340, 346, 291 and 280 request clarification of the correct interpretation of s5(2)(c) of the RMA in relation to avoiding, remedying or mitigating the adverse effects of natural hazards.

Sections 30(1)(c) and 31(b)(i), which relate to the function of Regional Councils and Territorial Authorities in relation to natural hazards, require only avoidance or mitigation. Remedying the effects of natural hazards is not provided for within these functions and this is likely to be because the response and recovery from natural hazard events is managed via the Civil Defence and Emergency Management Act.

With only two options for dealing with natural hazards available to local authorities, decisions need to be made as to whether it is most appropriate in the circumstances to avoid or mitigate the hazard. The POP has been written with a preference for avoidance where the effects of land use or development are likely to be significant. In the case of development within floodways, impacts on the functioning of those floodways is likely to have a significant effect on other people, property and infrastructure and therefore avoiding development is considered to be the preferred approach.

In some situations, as is provided for within Chapter 10, some development may need to occur in sensitive areas and therefore mitigation of the effects of that development on natural hazards is required.

In later recommendations in this report, I recommend amending some of the policies in the POP to reflect that mitigation of hazards is appropriate

in certain situations, recognising that avoidance will not always be the most appropriate hazard management approach. However, this does not detract from the overarching intention of the POP to make the consideration of avoiding natural hazards the first preference to management of those hazards.

- (h) I agree with the intent of Horticulture NZ's support for initiatives that increase understanding and risk management to assist in risk reduction. The methods already included in the POP providing for information and advice to interested parties and to the public support this approach. It is noted that the POP intersects with the Civil Defence and Emergency Management Group Plan (CDEM Group Plan) for the Manawatu-Wanganui Region, which is prepared under the CDEM Act. The CDEM Group Plan provides guidance to the CDEM Group members (which include all Territorial Authorities and the Regional Council) in managing hazards (including natural hazards). Associated with the CDEM Group Plan is the CDEM Group Public Communications Strategy, which directs the way in which the public are educated and informed about natural hazards and ways in which people can minimise the effect of hazards. Given that the CDEM Group Plan is the primary mechanism for providing public information on hazards within the Region, it is not considered necessary to reinforce the methods in the POP in this regard.
- (i) Submitters request clarification of how the POP relates to the Code for Urban Subdivision (NZS:4404:2004). NZS:4404:2004 provides a standard for the design of infrastructure and other components associated with subdivision and development. The standard can be adopted by Territorial Authorities as a design standard for the construction of components of subdivision and development but it does not take the place of District Plan provisions or conditions on resource consents. As described at C.1.1 of the code (pg 14), the standard does not include all minimum requirements for land subdivision and engineering. It may therefore be necessary for Territorial Authorities to specify other standards in relation to managing engineering design for climate change. Where Territorial Authorities do not consider that NZS: 4404:2004 provides sufficient design guidance to take into account climate change or sea-level rise, or where the design event is different to the design event specified in the POP, it may be necessary for further standards to be specified in the District Plan or bylaws. How the use of the standard is adapted to meet this situation will be at the discretion of each council.
- (j) Submitters request that greater recognition of the role that gravel extraction plays in flood hazard management is included in the POP. Gravel extraction is a complementary industry in many instances which enables maintenance of flood control schemes to be undertaken in conjunction with private organisations. This is a symbiotic relationship in many cases as private organisations generate an income from an activity that may also benefit the wider community through assisting with flood scheme management.

However, it must also be recognised that gravel extraction is one of a number of measures to assist with mitigating flooding hazards (stopbank

construction and management, channel diversions, floodway maintenance, ground level modifications, etc) and therefore it would not be appropriate or necessary to include specific policy recognition for gravel extraction activities alone. Furthermore, while gravel extraction activities may have benefits for flood hazard management in some locations, the effects of these activities in relation to other environmental components, such as water quality and aquatic and terrestrial ecosystem still need to be considered and managed appropriately. The benefits of gravel extraction to flood hazard management will be given due regard through Regional Council resource consent applications and District Plans when assessing the overall effects of those activities. Therefore it is not considered appropriate to place additional weighting on the benefits of gravel extraction via the policies in Chapter 10.

- (j) Submitters request clarification as to why the 0.5% AEP flood limit has been used in the POP as the level to which Territorial Authorities are expected to manage land uses. As described by Mr Blackwood in his evidence, the 0.5% AEP flood event has been selected to incorporate a safety factor into the previously used 1% AEP flood event. The 0.5% AEP flood level has been defined in a complex flood model which integrates a margin for changes in the scale and intensity of flood events as a result of climate change. By incorporating a climate change margin within the flood hazard model and the subsequent mapping information that is provided to Territorial Authorities, it removes the requirement for Territorial Authorities to include a separate climate change factor when mapping the flood hazard in District Plans.
- (k) Submitters request that specific areas or sites be included on the maps in Schedule I, including Ohura and the Taumarunui Flood Protection Scheme, district drainage schemes and the Taonui Basin Spillway (Horizons Regional Council).

In terms of the areas that are mapped in Figure I:1 of Schedule I, these are indicative only for the purposes of Chapter 10. The areas mapped in Figure I:1 are primarily catchments within which there are flood and drainage schemes. The map does not define the extent of those schemes and does not map floodable areas. The disclaimer on Figure I:1 advises that some of the areas mapped are catchments within which flood schemes are present. This indicates that there will be areas that are shaded on the map that are not actually floodable. The accurate mapping of actual floodable areas is to be provided to Territorial Authorities by way of detailed GIS (geographic information systems) data files rather than in Figure I:1.

The regional scale of the map in Figure I:1 means that the floodable area for locations such as Ohura will be difficult to identify. Given that Figure I:1 is only indicative and therefore provides no specific purpose in relation to Chapter 10, I do not consider it is necessary to include small floodable areas, such as the area around Ohura. The flood scheme area around Taumarunui is already included in Figure I:1 and it is therefore not proposed to make further changes to the map.

The Regional Council has requested that Map I:3, which shows the Taonui Basin Spillway, be replaced with a map that more accurately

reflects the extent of the floodway. Given that this is an improvement of the accuracy of the map as notified, I consider that it is appropriate to include the revised map, subject to changes to the labelling of the maps as will be addressed in later sections of this report. The specific changes to Figure I:3 will be addressed in Section 3.21 of this report.

In terms of mapping district drainage schemes, this is considered to be more appropriately done by district councils themselves as they generally hold the information on the extent of these areas. Where district councils consider that the management of development within drainage schemes administered by their own council requires consideration, they are able to include rules within District Plans to achieve this. Therefore, it is not considered to be necessary to include district drainage schemes on the maps in Schedule I.

- (l) Ruapehu District Council requests that lahar flow paths are identified in the POP. The effects of lahar flowpaths are generally isolated to specific areas and therefore are more appropriately managed by the District Council at the local level, in much the same way as floodable areas and other natural hazard areas are. The principal management technique associated with lahar hazard is managing land use activities in those areas, such as subdivision and development of buildings. This is more appropriately dealt with through District Planning documents. Schedule I in the POP identifies 'floodways', which are specific flood management mechanisms, but other flood hazard areas are not mapped (see discussion in (k) above). Information and data on lahar flowpaths is provided to Territorial Authorities as part of the information provision relationship that Horizons has with those authorities, and it is considered most appropriate that the mapping of those hazards is done in District Plans at a scale that is able to be used in decision-making for land use activities. I therefore do not consider that it is necessary to include lahar flowpaths in the POP.
- (m) Submitters' request that the POP include a requirement for a long-term planning forum to be established to consider sustainable management issues such as climate change is acknowledged as potentially being beneficial to good planning, but is not a matter to be promoted through the Natural Hazards chapter of the POP. Long-term changes to the environment require management consideration over a timeframe longer than the 10-year immediate life of the POP. However, the review and development of the POP inherently requires consideration of long-term management of the effects of climate change, and this is recognised through the policy that directs a precautionary approach be taken to development in this regard. The exact extent and implications of climate change are currently unknown, but knowledge will build over time as more research is undertaken and a better understanding of the phenomenon is gained. The Regional Council and all Territorial Authorities have a role to play in developing an understanding of these changes and developing planning mechanisms to respond to those changes, but this is a non-statutory function that sits outside the statutory role of the POP.
- (n) Submitter seeks clarification of the terms 'floodway' and 'floodable areas'. I agree that there is currently confusion created between the

wording in Chapter 10 and the maps in Schedule I, in that the maps in Schedule I that are intended to show 'floodways' do not clearly label them as such. To improve the clarity of the maps in Schedule I and therefore remove the confusion in terms of terminology used in the POP, I recommend that the maps be amended to clarify that the mapped areas are 'floodways'. The recommended revised maps are attached as Appendix A to this report.

- (o) Submitters request that the maps in Schedule I be produced at a better scale to allow easier use. This matter is discussed in Section 4.20 of this report, which relates to Schedule I.
- (p) The request to reinstate a draft policy (from an earlier draft version of the POP) which details the considerations to be given when making decisions on coastal erosion protection structures is not considered necessary. The assessment of applications for coastal structures is provided for in the rules of Chapter 17 of the POP, which relates to activities in the coastal marine area. As the assessment of such structures is best managed through that process, it is appropriate that the matters for assessment are included in that chapter. Providing a policy in Chapter 10 would achieve the same outcome but would result in repetition.
- (q) A submitter requests that the Net Water Balance be included in rules and assessment criteria for considering resource consent applications. Chapter 10 does not include rules or assessment criteria and therefore it is outside the scope of this chapter to include the requested provisions.

4.1.3 Recommendation NH 1

- (a) Accept in part submissions requesting:
 - i. Support for the overall approach to natural hazards
 - ii. Amendments to the maps in Schedule I
 - iii. Inclusion of reference to social, economic and cultural factors
- (b) Accept submissions requesting:
 - i. Clarification of the terms 'floodable area' and 'floodway'
- (c) Reject submissions requesting:
 - i. Cross-references to the Te Ao Maori chapter
 - ii. Mapping of lahar flow paths
 - iii. Clearer policy direction in managing hazards for climate change and sea-level rise
 - iv. The correct interpretation of s5(2) of the RMA
 - v. Inclusion of more specific public advice on natural hazards
 - vi. Clarification of the relationship of the POP with NZS:4404:2004
 - vii. Greater recognition of the role that gravel extraction plays in managing flooding hazards
 - viii. Clarification of why the 0.5% AEP flood event is used
 - ix. Creation of a long-term planning forum
 - x. Improving the scale of the Schedule I maps
 - xi. A policy addressing structures in the coastal marine area
 - xii. Use of the Net Water Balance in rules and assessment criteria

4.1.3.1 Recommended changes to provision

- (a) Recommended changes to provisions are included in the sections of this report that address those specific provisions.

4.2 Chapter 10 Paragraph 10.1 Scope and Background

Table of Submitters, Submission Points and Recommendations

Submitter	Number	Point	Decision Sought	Recommendation
G N S SCIENCE	31	1	The scope and background section " could be strengthened by identifying HRC's responsibilities for hazard management/ risk reduction under the CDEM Act via the Manawatu Wanganui CDEMG Plan"	Accept in part
G N S SCIENCE	31	12	GNS recommend that: the wording of the scope and background section which should be amended to keep the document consistent [with policy 10-5]	Accept in part
G N S SCIENCE	31	2	The hazards identified within the section need to be checked with those outlined in the CDEM Group Plan to ensure the two plans are consistent.	Accept in part
G N S SCIENCE	31	3	It is also appropriate to mention the hazard management approach in regards to risk reduction, roles and responsibilities under the CDEM Act and the CDEMG Plan in the scope and background section.	Accept in part
G N S SCIENCE	31	4	GNS Science supports the reinstatement of this approach (bullet point (d) in the One Plan working document version 4 March 2006) as it is consistent with the risk-based approach out lined in Risk Standard AS/NZS Standard 4360.	Reject
G N S SCIENCE	31	5	It is recommended that the wording is revised to reflect the precautionary approach recommended in Policy 10-5	Accept in part
MANAWATU DISTRICT COUNCIL	340	77	The possibility of landslip needs to be mentioned as a hazard on Page 10-2- (it is related to erosion but different to it). The stability of building sites and their susceptibility to slippage from above or below is a real concern in our hill country.	Accept in part
	X 481	633	PALMERSTON NORTH CITY COUNCIL - Support	Accept in part
HORTICULTURE NEW ZEALAND	357	98	Decision Sought: Amend Scope and Background 10.1 to refer to 'land disturbance' not soil disturbance.	Accept

Submitter	Number	Point	Decision Sought	Recommendation
	X 492	174	MINISTER OF CONSERVATION - Support	Accept
FEDERATED FARMERS OF NEW ZEALAND INC	426	117	Reword Bullet Point 1 as follows: "Soil disturbance and vegetation clearance, particularly on hill slopes highly erodible land, which can increase the erosion risk and amount of sediment in the flood channel." (or words to that effect)	Accept in part
FEDERATED FARMERS OF NEW ZEALAND INC	426	118	Reword last paragraph as follows: "The February 2004 storm event caused widespread flooding. Recovery from that event will span many years. It showed only too well the problems that can arise from storm events vegetation clearance on hill slopes and from residential settlements and infrastructure on flood-prone or unstable land. ."(or words to that effect)	Reject

4.2.1 Summary of submissions

- (a) Submitters request inclusion of a reference to the Regional Council's functions under the CDEM Act.
- (b) Clarify the reduction role the POP has in terms of the 'four Rs' specified in the CDEM Act.
- (c) Amend wording to be consistent with the 'precautionary approach' specified in Policy 10-5.
- (d) Ensure consistency of listed hazards between CDEM Group Plan and POP.
- (e) Reinstate reference to consultation as a method for setting of acceptable levels of risk.
- (f) Include specific reference to land slip as a hazard.
- (g) Amend wording to refer to 'land disturbance' rather than 'soil disturbance', to ensure consistency with Land chapter.
- (h) Include reference to erosion in Erosion Management Areas in first bullet point, to be consistent with Land chapter.
- (i) Amend last paragraph on page 10-1 to refer to the problems that can arise from storm events and remove the reference to land uses.

4.2.2 Legislative assessment

The management of natural hazards is addressed in a number of pieces of legislation, but particularly in the Civil Defence and Emergency Management Act 2002 and the Resource Management Act 1991.

The CDEM Act has as its purpose:

3 Purpose

The purpose of this Act, which repeals and replaces the Civil Defence Act 1983, is to —

- (a) improve and promote the sustainable management of hazards (as that term is defined in this Act) in a way that contributes to the social, economic, cultural, and environmental well-being and safety of the public and also to the protection of property; and*
- (b) encourage and enable communities to achieve acceptable levels of risk (as that term is defined in this Act), including, without limitation,—*
 - (i) identifying, assessing, and managing risks; and*
 - (ii) consulting and communicating about risks; and*
 - (iii) identifying and implementing cost-effective risk reduction; and*
 - (iv) monitoring and reviewing the process; and*
- (c) provide for planning and preparation for emergencies and for response and recovery in the event of an emergency; and*
- (d) require local authorities to co-ordinate, through regional groups, planning, programmes, and activities related to civil defence emergency management across the areas of reduction, readiness, response, and recovery, and encourage co-operation and joint action within those regional groups; and*
- (e) provide a basis for the integration of national and local civil defence emergency management planning and activity through the alignment of local planning with a national strategy and national plan; and*

(f) encourage the co-ordination of emergency management, planning, and activities related to civil defence emergency management across the wide range of agencies and organisations preventing or managing emergencies under this Act and the Acts listed in section 17(3).

The CDEM Act covers the full gambit of hazard management measures, namely reduction, readiness, response and recovery (the four Rs). However, the RMA provides an effective tool for the management of development and land use activities. It therefore is a logical mechanism for addressing the hazard reduction role, through land use controls restricting development in areas that are subject to natural hazards.

The RMA includes specific reference to natural hazards in sections 30 and 31 (Functions of Regional Councils and Territorial Authorities) and requires the following:

- Regional councils shall *control the use of land for the purpose of the avoidance or mitigation of natural hazards* (s30)
- Territorial Authorities shall have the function of 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* (s31)

S62 specifies the contents of Regional Policy Statements, which must state *the local authority responsible in the whole or any part of the region for specifying the objectives, policies, and methods for the control of the use of land to avoid or mitigate natural hazards or any group of hazards.*

Territorial Authorities also have the ability to control subdivision where the development is likely to be affected by some natural hazard events (*erosion, falling debris, subsidence, slippage, or inundation from any source*) via s106.

Comparing the CDEM Act and the RMA, the CDEM Act has a wider scope than the RMA in that it addresses both natural and other hazards, but there is clearly a degree of cross-over in responsibilities under both Acts. The response, readiness and recovery roles, while important to integrate with RMA planning documents, would seem to more comfortably fall within the scope of the CDEM Act.

4.2.3 Evaluation

- (a) Submitters request inclusion of a reference to the Regional Council's functions under the CDEM Act. It is considered that there is already reference to the relationship between the RMA and the CDEM Act in Section 10.1, which provides an indication that the Regional Council holds other responsibilities for natural hazard management under other legislation. However I consider that it is useful to plan users to provide additional clarity as to the functions of both the Regional Council and the Territorial Authorities under the CDEM Act and the CDEM Group Plan, which is the key mechanism for the councils to meet their requirements under that Act. There needs to be a clear link between the RMA and CDEM Act policy documents to ensure that Plan users understand the relationships. Therefore it is recommended to include additional text in Section 10.1 to clarify the role of the CDEM Group Plan and its relationship to RMA policy documents such as the POP.

- (b) Submitters request that the reduction role the POP plays in terms of the four Rs specified in the CDEM Act is reinforced in Section 10.1. Providing a clear indication that the primary role of the POP is to be instrumental in the 'reduction' component of hazard management through management of land uses is considered to improve understanding of the role the POP plays in natural hazard management. I therefore recommend amending the last sentence of the third paragraph of Section 10.1 to refer directly to the POP's risk reduction role.
- (c) Submitters have identified that the 'precautionary approach' specified in Policy 10-5 is not consistent with the approach suggested in the last paragraph of Section 10.1, which deals with 'other natural hazards'. I agree with the submitter. The explanation in Section 10.1 suggests that where there is limited knowledge of natural hazards, contingency planning, including response preparations and insurance, is the preferred approach. While it is acknowledged that managing the location and types of land uses in circumstances where the exact extent of natural hazards is unknown is difficult, the wording in this paragraph does not reflect the role that hazard avoidance still plays in reducing risk. Policy 10-5 clearly directs people to adopt a precautionary approach to reducing the natural hazard risk in the first instance. This is compatible with the contingency planning responses for these areas, which may indeed need to be more comprehensive than would otherwise be the case in situations where the scale and extent of the hazard is better understood. It is therefore recommended to amend the wording in the last paragraph of Section 10.1 to reflect the precautionary approach of Policy 10-5, but to retain the recognition that contingency planning may play a greater role in hazard management that would otherwise be the case.
- (d) The CDEM Group Plan and the POP include lists of natural hazards that are relevant to the Region. Consistency between these two documents is important, given that each has a role to play in the management of those hazards. The CDEM Group Plan lists the following natural hazards for the Region:
- Volcanic action
 - Flooding
 - Earthquake
 - Tsunami
 - Land subsidence

The POP currently lists the following natural hazards in Section 10.1:

- Flooding
- Earthquakes
- Tsunami
- Volcanic eruptions
- The impacts of climate change
- Erosion

A volcanic eruption is one component of volcanic action, which would also include associated hazards such as pyroclastic flows and pyroclastic falls. I therefore consider that the POP would more

accurately reflect this hazard by referring to volcanic action as described in the CDEM Group Plan.

Erosion takes many forms and in many cases is not a natural hazard itself, such as minor rilling on exposed soil. Forms of erosion, including mass movement, are regarded as natural hazards. However, erosion does influence the effects of natural hazards, particularly where deposition of eroded material reduces the flood capacity of rivers. It is more relevant to list land subsidence, which incorporates mass movement events (slips, etc) and coastal erosion, than erosion. I note that there is some cross-over between managing erosion from a natural hazard perspective in Chapter 10 and managing erosion from a wider perspective in Chapter 5 (Land). This relationship is already recognised in Section 10.1.

The impacts of climate change is not considered to be a natural hazard in itself, but will influence the frequency, intensity and scale of atmospherically driven natural hazards as well as coastal hazards (indirectly via sea-level change). Therefore it is not considered necessary to list climate change in the POP as a natural hazard in its own right.

Therefore, I recommend that the natural hazards referred to in the POP are amended to be the same as those specified in the CDEM Group Plan for the Region. I also recommend that the impacts of climate change are not listed as a natural hazard but that the second paragraph of Section 10.1 is amended to reflect the influence of climate change on natural hazards.

I note that there are some natural hazards that are relevant to the Region but which are not specified in the CDEM Group Plan or in the POP. These include drought, wind events and fire. As there is insufficient scope within submissions to include these other hazards, I do not recommend any changes in this regard.

- (e) The reinstatement of a reference to consultation as a method for setting of acceptable levels of risk is not considered necessary as consultation is implicit in the formulation of the POP and in the development of District Plan provisions. The consultation undertaken during the formulation of these documents enables communities to consider the level of risk that is acceptable and is not therefore considered necessary to list it as 'an approach to managing natural hazards in this Plan'.
- (f) As discussed above, amending the list of hazards to include 'land subsidence' addresses the submitter's request to include 'land slip' as a hazard. Land subsidence incorporates land slip.
- (g) I agree with the submitter's request to amend the wording in the first bullet point of the second paragraph to refer to 'land disturbance' rather than 'soil disturbance' to ensure consistency with Land chapter.
- (h) The submitter's request to improve consistency with the wording in the Land chapter (chapter 5) by referring to Highly Erodible Land (this terminology has been recommended to be changed to Erosion

Management Areas as part of the Chapter 5 – Land hearing) in the first bullet point of the second paragraph is considered appropriate. While land disturbance and vegetation clearance in many areas can contribute to varying degrees to sedimentation of waterways, these activities in the Erosion Management Areas, being areas with slopes and soil types at greater risk of accelerated erosion, have higher potential to cause this effect. These areas are specifically managed through Chapter 5 of the POP. It is therefore considered appropriate to maintain a linkage to what is one of the ‘Big Four’ issues in the POP.

- (i) The submitter requests that the last paragraph on pg 10-1 be amended to refer to the problems that can arise from storm events and remove the reference to land uses. Natural hazards are formed by the interaction of activities and people with natural events. Human activities can cause or exacerbate the impact of natural events, such as the 2004 storms, by establishing structures (businesses, homes, infrastructure, etc) in areas that will be subject to natural events. Where people do not live or undertake activities in areas that will be affected by natural events, there is little or no risk and therefore little or no hazard is present. It is therefore appropriate to clarify this relationship in the POP and I recommended amending the wording in the second paragraph under the ‘flooding’ heading to refer to this relationship.

4.2.4 Recommendation NH 2

- (a) Accept submissions requesting:
 - i. Changing the reference from ‘soil disturbance’ to ‘land disturbance’
- (b) Accept in part submissions requesting:
 - i. Inclusion of the roles under the CDEM Act
 - ii. Clarification of the reduction role the POP plays in hazard management
 - iii. Amending the text to reflect the precautionary approach in the policies
 - iv. Amendments to the listed natural hazards
 - v. Amendment to refer to Highly Erodible Land (now Erosion Management Area)
- (c) Reject submissions requesting:
 - i. Reinstatement of consultation as a separate method for risk identification
 - ii. Removal of the reference to land uses

4.2.4.1 Recommended change to provisions

- (a) Amend first sentence of Section 10.1 to:
This chapter establishes an overall framework for natural hazard management under the ~~Resource Management Act 1991 (RMA)~~.
- (b) Amend second paragraph of Section 10.1 to:

The Region is vulnerable to a number of natural hazards. The principal threat is from flooding. Other natural hazards include earthquakes, tsunami, volcanic eruptions, ~~and the of e~~ action and land subsidence, and the of e Climate change

~~and erosion~~ is likely to influence the frequency, scale or intensity of atmospherically influenced natural hazards such as flooding. The vulnerability of the Manawatu-Wanganui Region to natural hazard events is increased because of human activity, such as:

- (c) Amend first bullet point in second paragraph of Section 10.1 to:

Soil-land¹ disturbance* and vegetation clearance*, particularly on hill slopes in the Hill Country Erosion Management Area,¹ which can increase the erosion risk and the amount of sediment in the flood channel, in turn increasing the intensity of and effects from floods and reducing the effectiveness of mitigation measures such as stop banks.

- (d) Amend third paragraph in Section 10.1 to:

Most of the Regional Council's operational work on natural hazard management is carried out under the Soil Conservation and Rivers Control Act 1941, which provides for the establishment of river and drainage schemes. Emergency response, community readiness, and¹ recovery planning, and research into natural hazard risks, is carried out under the Civil Defence and Emergency Management Act 2002. These roles are implemented through the Civil Defence and Emergency Management Group Plan rather than through the One Plan.¹ The role of the Regional Council and Territorial Authorities under the RMA is primarily one of risk reduction¹ to ensure that resource use activities do not exacerbate natural hazard risks or impede natural hazard mitigation works, - Therefore and by¹ ensuring that developments do not put people or property in places or circumstances of undue risk.

- (e) Amend second paragraph under the 'Flooding' heading to:

The February 2004 storm event caused widespread flooding. Recovery from that event will span many years. It showed only too well the problems that can arise from the combination of a large storm event with¹ vegetation clearance* on hill slopes, and from residential settlements and infrastructure on flood-prone or unstable land. The resulting sedimentation in waterways and erosion on land has impacted on infrastructure*, people, land use and the natural environment.

- (f) Amend last paragraph of Section 10.1 to:

Other natural hazards

Other natural hazards that occur less frequently include earthquakes, ~~volcanism~~ volcanic action, land subsidence² and coastal environment hazards (including tsunami, storm surge and sea level rise hazards). Despite their low frequency, they have potential to put the Region at risk. ~~Factors such as climate change are likely to exacerbate the risk of climatic hazards.²~~ Although little is known of the risks of these hazards, current research, such as Horizons' tsunami hazards study, will enable better future planning. Due to limited knowledge of the influence climate change may have on some natural hazard events, a precautionary approach to establishing or intensifying land use activities in areas potentially subject to natural hazards is required.² Potential impacts will continue to be dealt with by contingency planning, such as the regional civil defence response team and insurance schemes, until further research can be undertaken.

¹ Recommendation NH2

4.3 Chapter 10 Issue 10-1 and Objective 10-1 Effects of natural hazard events

Table of Submitters, Submission Points and Recommendations

Submitter	Number	Point	Decision Sought	Recommendation
G N S SCIENCE	31	6	GNS Science recommend that the description of Natural hazards can adversely affect people and infrastructure be extended to include, the social, economic, cultural and natural environments.	Accept in part
PALMERSTON NORTH CITY COUNCIL	241	89	That Horizons adopt Issue 10-1, Objective 10-1 and Policy 10-1.	Accept in part
	X 500	144	TARARUA DISTRICT COUNCIL - Support	Accept in part
	X 507	144	MANAWATU DISTRICT COUNCIL - Support	Accept in part
	X 515	144	HOROWHENUA DISTRICT COUNCIL - Support	Accept in part
	X 517	272	RANGITIKEI DISTRICT COUNCIL - Support	Accept in part
	X 532	144	WANGANUI DISTRICT COUNCIL - Support	Accept in part
G N S SCIENCE	31	7	GNS Support Objective 10-1	Accept in part
PALMERSTON NORTH CITY COUNCIL	241	90	That Horizons adopt Issue 10-1, Objective 10-1 and Policy 10-1.	Accept in part
	X 492	175	MINISTER OF CONSERVATION - Support	Accept in part
	X 500	145	TARARUA DISTRICT COUNCIL - Support	Accept in part
	X 507	145	MANAWATU DISTRICT COUNCIL - Support	Accept in part
	X 515	145	HOROWHENUA DISTRICT COUNCIL - Support	Accept in part
	X 517	273	RANGITIKEI DISTRICT COUNCIL - Support	Accept in part
	X 532	145	WANGANUI DISTRICT COUNCIL - Support	Accept in part
HORTICULTURE NEW ZEALAND	357	99	Decision Sought: Retain Objective 10-1.	Accept in part

4.3.1 Summary of submissions

- (a) Extend the description of the effects of natural hazards to refer to social, economic, cultural and natural environments.
- (b) General support for Issue 10-1 and Objective 10-1.

4.3.2 Evaluation

- (a) GNS Science has requested that Issue 10-1 include reference to social, economic and cultural well-being and to the natural environment. This is requested by the submitter to provide consistency with the CDEM Act.

The existing reference to the effects on 'people' would generally extend to the social, economic and cultural well-being of those people and communities. However to ensure that the wording of Issue 10-1 is clear, it is recommended to refer to the social, economic and cultural well-being of people in the issue. Natural hazards also affect more than just infrastructure, including other property (such as dwellings and businesses) as well as the natural resources which people rely on to maintain their social, economic and cultural well-being. It is therefore appropriate that Issue 10-1 refers to natural resources, but also to property. Amending the wording to refer to these additional items improves the consistency of the first sentence of the issue with the following bullet points, which refer to 'property' and 'damage to communities'.

Objective 10-1 is generally reflective of Issue 10-1, but I recommend that the reference to the 'economic well-being' of communities is widened to the overall well-being. Natural hazards can have a significant impact on the social and cultural aspects of communities and it is therefore relevant that the objective is inclusive of those values.

- (b) Other than the amendments recommended above, I accept those submissions that support or recommend retention of Issue 10-1 and Objective 10-1. For clarity reasons I also recommend moving the last sentence of clause (b) to a new clause as it deals with a separate issue (the implications of predicted sea-level rise).

4.3.3 Recommendation NH 3

- (a) Accept in part submissions requesting that Issue 10-1 and Objective 10-1 be retained.
- (b) Accept in part submissions requesting inclusion of reference to social, economic and cultural well-being in the wording of Issues 10-1 and Objective 10-1.

4.3.3.1 Recommended changes to provision

- (a) Amend the first sentence of Issue 10-1 to:

Natural hazard events can adversely affect people, including their social, economic and cultural well-being, and the natural and physical resources they rely on, such as property and infrastructure*. In particular:

- (b) Move the last sentence of Issue 10-1(b) to a new clause.
- (c) Amend Objective 10-1 to:
The adverse effects of natural hazard events on people, property, infrastructure* and the ~~economic~~— well being of communities and ~~infrastructure*~~ are avoided or mitigated.

This Objective relates to Issue 10-1

4.4 Chapter 10 – Policy – General

Table of Submitters, Submission Points and Recommendations

Submitter	Number	Point	Decision Sought	Recommendation
ENVIRONMENTAL WORKING PARTY	386	89	<p>Policy 10-7</p> <p>Other activities</p> <p>(a) All activities involving Natural Hazards shall take into account chapter 4</p> <p>(b) Remedial action for any adverse effects to the environment will be undertaken</p> <p>(c) Constant monitoring of activities will ensure compliance to the Resource Consent and all relevant legislation and regulations</p> <p>(d) The Regional Council will lobby the relevant legislative bodies to impose penalties for non compliance that:</p> <p>i) are appropriate to the adverse environmental effects</p> <p>ii) account for the remedial process, and</p> <p>iii) will act as a deterrent for those intending not to comply.</p> <p>(e) The relevant Maori/ iwi and/or hapu organisation shall be notified of any disturbance to sites of significance for Maori</p> <p>(f) The relevant Maori/ iwi and/or hapu organisation shall be notified of any discovery of koiwi (bones) or artifacts and any type of activity shall stop until the appropriate processes have been completed.</p> <p>(g) In the event of any unforeseen circumstances occurring from activities</p>	Reject

Submitter	Number	Point	Decision Sought	Recommendation
NGA PAE O RANGITIKEI	427	89	<p>undertaken by the Resource applicant, remedial action will be undertaken to the satisfaction of Horizons Regional Council.</p> <p>Policy 10-7</p> <p>Other activities</p> <p>(a) All activities involving Natural Hazards shall take into account chapter 4</p> <p>(b) Remedial action for any adverse effects to the environment will be undertaken</p> <p>(c) Constant monitoring of activities will ensure compliance to the Resource Consent and all relevant legislation and regulations</p> <p>(d) The Regional Council will lobby the relevant legislative bodies to impose penalties for non compliance that:</p> <p>i) are appropriate to the adverse environmental effects ii) account for the remedial process, and iii) will act as a deterrent for those intending not to comply.</p> <p>(e) The relevant Maori/ iwi and/or hapu organisation shall be notified of any disturbance to sites of significance for Maori</p> <p>(f) The relevant Maori/ iwi and/or hapu organisation shall be notified of any discovery of koiwi (bones) or artifacts and any type of activity shall stop until the appropriate processes have been completed.</p> <p>(g) In the event of any unforeseen circumstances occurring from activities undertaken by the Resource applicant, remedial action will be undertaken to the satisfaction of Horizons Regional Council.</p>	Reject
LANDLINK LTD	440	72	We support the protection of floodways and overflow paths.	Accept

4.4.1 Summary of submissions

- (a) Include direct reference to Chapter 4 Te Ao Maori in this chapter and require remedial action of environmental effects, constant monitoring, lobbying of legislative bodies, required notification of iwi/hapu.
- (b) General support for the protection of floodways and overland flowpaths.

4.4.2 Evaluation

- (a) Submitters request that a list of requirements be included in Chapter 10, including requirements for remedial action of environmental effects, constant monitoring, lobbying of legislative bodies and compulsory notification of resource consent applications to iwi/hapu.

The matters requested by submitters to be included in Chapter 10 are either covered elsewhere within the POP or are not able to be specifically required. For example, the POP cannot require that certain parties are notified as part of consent processes, as notification is considered on a case-by-case basis depending on the effects of the proposed activity in accordance with s93 and s94 of the RMA. Lobbying of legislative bodies for changes to legislation is an activity that sits outside the POP. In terms of addressing adverse effects that are occurring as a result of activities, enforcement provisions within the RMA provide sufficient scope to resolve these matters, whether they are a result of non-compliance with resource consents or permitted activity rules in plans. Therefore no changes to the policies of Chapter 10 are proposed.

- (b) The submitters support for the provisions that protect floodways is acknowledged.

4.4.3 Recommendation NH 4

- (a) Reject submissions requesting greater reference to the Te Ao Maori chapter and other related amendments to Chapter 10.
- (b) Accept submissions supporting the protection of floodways.

4.4.3.1 Recommended changes to provision

- (a) None.

4.5 Chapter 10 – Policy 10-1 Responsibilities for natural hazard management

Table of Submitters, Submission Points and Recommendations

Submitter	Number	Point	Decision Sought	Recommendation
G N S SCIENCE	31	8	GNS Science recommend It is appropriate to recognise HRC responsibilities for hazard management under both Acts, especially as reduction" under the CDEM Act is assumed to be managed under the RMA	Accept
RUAPEHU DISTRICT COUNCIL	151	121	(vi) Regional Council to retain Policy 10-1(b)(iii) of the One Plan.	Accept
	X 481	186	PALMERSTON NORTH CITY COUNCIL - Support	Accept
BRUCE & MARILYN BULLOCH	237	15	Extend the scope of 10.1 (a) (l) (page 10-3) Monitoring if people are in fact prepared for emergencies. Incorporate this into 10.6. Anticipated Environmental Results (2nd paragraph) (page 10-6)	Accept in part
PALMERSTON NORTH CITY COUNCIL	241	91	That Horizons adopt Issue 10-1, Objective 10-1 and Policy 10-1.	Accept in part
	X 500	146	TARARUA DISTRICT COUNCIL - Support	Accept in part
	X 507	146	MANAWATU DISTRICT COUNCIL - Support	Accept in part
	X 515	146	HOROWHENUA DISTRICT COUNCIL - Support	Accept in part
	X 517	274	RANGITIKEI DISTRICT COUNCIL - Support	Accept in part
	X 532	146	WANGANUI DISTRICT COUNCIL - Support	Accept in part
ENVIRONMENT WAIKATO	385	11	In particular, Environment Waikato is supportive of the definition of a base line return level event (currently stated in Policy 10-1 as a 0.5% annual exceedence probability flood event). It is important that clear expectations are provided to the community as to the level of risk that is appropriate and therefore the areas that development will avoid where possible. This provides a clear statement of expectation of what is required for land use planning and any subsequent application for land	Accept in part

Submitter	Number	Point	Decision Sought	Recommendation
use in a floodable area.				
	X 481	42	PALMERSTON NORTH CITY COUNCIL - Oppose	Accept in part
	X 495	193	RUAPEHU DISTRICT COUNCIL - Oppose	Accept in part
	X 500	157	TARARUA DISTRICT COUNCIL - Oppose	Accept in part
	X 507	157	MANAWATU DISTRICT COUNCIL - Oppose	Accept in part
	X 515	157	HOROWHENUA DISTRICT COUNCIL - Oppose	Accept in part
	X 517	67	RANGITIKEI DISTRICT COUNCIL - Oppose	Accept in part
	X 532	157	WANGANUI DISTRICT COUNCIL - Oppose	Accept in part
ENVIRONMENT WAIKATO	385	13	Environment Waikato suggests that further clarification be provided in the One Plan as to how the 0.5% annual exceedence probability flood event will be calculated, specifically should this calculation include predictions for the effects of climate changes, and if so this should be specifically stated.	Reject
MANAWATU BRANCH OF N Z GREEN PARTY	433	50	Extend the scope of 10.1 (a) (I) (page 10-3) Monitoring if people are in fact prepared for emergencies, such as by phone survey.	Reject
LANDLINK LTD	440	66	We do not consider that reference to the legislation is necessary for Policy 10-1.	Reject
LANDLINK LTD	440	67	Submitter does not request a decision, however they do note: There is a lot of work placed on local authorities by Policy 10-1 and we are concerned of their ability to cope with this.	Reject
LANDLINK LTD	440	68	There is probably no need for Policy 10-1; (c); (i) in relation to rules in District and City Plans since section 106 of the Resource Management Act 1991 gives the Council a wide discretion to consider natural hazards.	Reject

4.5.1 Summary of submissions

- (a) Include reference to Horizons Regional Council's role under the CDEM Act.
- (b) Retain Policy 10-1(b)(iii) which relates to the Regional Council's role in obtaining, storing and disseminating natural hazards information.
- (c) Monitoring for preparedness to be listed as one of the roles of both the Regional Council and Territorial Authorities.
- (d) Support for specification of 0.5% AEP event as the appropriate risk level to which to manage.
- (e) Provide clarification in the POP as to how the 0.5% AEP flood event will be calculated and how climate change will be factored into that level.
- (f) Reference to legislation in this policy is not considered necessary.
- (g) Concern raised about capability of Territorial Authorities to undertake the roles required by the policy.
- (h) Remove reference to Policy 10-1(c)(i) as this matter is sufficiently addressed by s106 of the RMA.
- (i) General support.

4.5.2 Legislative assessment

Policy 10-1 is included in the POP to meet the requirement of s62(1)(i) of the RMA, which requires that:

A Regional Policy Statement must state the local authority responsible in the whole or any part of the region for specifying the objectives, policies, and methods for the control of the use of land to avoid or mitigate natural hazards or any group of hazards.

The purpose of Policy 10-1 is to clearly differentiate the roles and responsibilities of the local authorities within the Region. Providing this clear distinction improves integrated management of natural hazards within the Region.

4.5.2 Evaluation

- (a) The submitter's request to include reference to the Regional Council's role under the CDEM Act is agreed with, but it is considered more relevant to include this information in the introduction to the chapter rather than specifically within policies. The policies in the POP define the requirements of local authorities under the RMA rather than under other legislation.
- (b) I agree with the submitter that Policy 10-1(b)(iii), which relates to the Regional Council's role in obtaining, storing and disseminating natural hazards information, should be retained. This policy provides certainty that it is the Regional Council's responsibility to undertake these activities.
- (c) The submitter's request to include specific requirement in the policy to monitor for public preparedness is not considered necessary because preparedness and response to natural hazards is already incorporated

into Policy 10-1(a), where it refers to raising public awareness of the risks of natural hazards, people knowing what they can do to minimise their own level of risk, and what help is available. In order for the policy to be implemented and achieved, knowledge of the existing level of preparedness is implicit. The act of 'raising' public awareness suggests that an understanding of the existing level of awareness must first be gained.

Monitoring of the effectiveness of the policy is addressed in the Anticipated Environmental Results. It is considered appropriate to include clearer reference to preparedness in the anticipated environmental results. Changes are therefore recommended in the section of this report that addresses that section of Chapter 10.

I note also that preparedness is primarily managed by the CDEM Act via the CDEM Group Plans. S3(2) of the CDEM Act identifies preparedness as part of the purpose of the CDEM Act.

(2) provide for planning and preparation for emergencies and for response and recovery in the event of an emergency

While there is some cross-over between the RMA and CDEM Act requirements for managing natural hazards, specification of who is to monitor for preparedness for hazard events is principally a CDEM Act function and is therefore best implemented via the CDEM Group Plan function. The functions of local authorities under the RMA is primarily intended to manage land use activities rather than the actions of people.

- (d) The submitter gives their support for the specification of the 0.5% AEP flood event as the appropriate risk level to which to manage. However it is noted that the submitter also suggests that the policy promotes the avoidance of activities in areas affected by the 0.5% AEP flood event. Policy 10-1 does not specify how land use should be managed in relation to this event. It only specifies the scale of event to be managed. Subsequent policies direct management of land uses in relation to such events. Therefore, the policy does not promote avoidance as a management preference – it is silent on how land use should be managed in relation to such events.
- (e) The submitter requests that the POP include details of how the 0.5% AEP flood event will be calculated and how climate change will be factored into that level. I note that Policy 10-1 only relates to the roles of local authorities and therefore it is outside the scope of the policy to define how flood events are to be calculated.

Looking more broadly at Chapter 10, it is considered that including a detail such as how flood event return periods are to be calculated is too specific for an over-arching Regional Policy Statement. The detailed calculations to define a 0.5% annual exceedence probability flood event are too complex to include in the POP. Instead, the combination of policies and methods provides a framework for the Regional Council to undertake the detailed analysis of the flood events to be managed and then to provide that information to Territorial Authorities for specific land use management purposes.

The POP provides clear direction to local authorities that climate change has to be factored in to the roles and functions that those authorities undertake (Policy 10-6). This extends to the determination of expected scale and extent of flood events, as well as the management response to those events. How climate change is factored into the calculations of flood AEP will be described to Territorial Authorities at the time the flood mapping information is provided to them. Where climate change has been factored into the actual mapping data provided, this removes the obligation for Territorial Authorities to have to calculate the climate change influence themselves. Therefore I do not consider it necessary to provide further detail in the POP as to how the 0.5% AEP flood event should be calculated.

- (f) The reference to legislation (s62(1)(i) of the RMA) is considered to be appropriate given that it is this section of the Act that directs a Regional Policy Statement to specify the roles and responsibilities for managing natural hazards. By including reference to the relevant section of the Act, it is clear that the intention of this policy is to satisfy that specific requirement.
- (g) The submitter raises some concern about the capability of Territorial Authorities to undertake the roles required of them by the policy. It is noted that the roles and responsibilities of local authorities included in the policy are those that are required to be achieved by legislation (the RMA) and that the policy is simply clarifying where those roles reside. It is also noted that there were no submissions from Territorial Authorities themselves raising concern about their own capabilities or capacity for undertaking the specified roles (although some concern was raised about how those roles would be implemented due to limited information on some hazards). Given this, I consider that there is no need to modify the provisions of Chapter 10 to account for individual Territorial Authority capability.
- (h) I do not agree with the submitter's suggestion that Policy 10-1(c)(i) is not necessary as this matter is sufficiently addressed by s106 of the RMA. S106 only influences subdivision resource consent applications and does not enable wider management of natural hazards through objectives and policies or the setting of rules. Objectives, policies and rules are important in managing natural hazard effects because they provide direction on how activities in hazard-prone areas will be addressed across the district. The rules in District Plans also provide a trigger for activities (both subdivision and land use) to be assessed, at which point s106 may come into play in relation to subdivisions only.

Where there are no rules controlling land use activities in hazardous areas, many activities would be able to occur as permitted activities without any control other than via the Building Act. Section 106 provides a backstop for managing natural hazards in areas that are not currently identified as 'hazard zones', but it does not provide sufficient scope to manage natural hazards across a district in an integrated manner. I therefore consider that Policy 10-1(c)(i) should be retained.

- (i) Submissions that generally support Policy 10-1 are accepted and agreed with.

- (j) For the purposes of clarity, I recommend that minor changes to the wording of the policy are made.

4.5.3 Recommendation NH 5

- (a) Accept submissions that support Policy 10-1.
- (b) Reject submissions that request additions or clarifications to Policy 10-1.

4.5.3.1 Recommended changes to provision

- (a) Amend Policy 10-1(c)(ii) to:
 - (ii) identifying floodways (as shown in Schedule I) and other areas known to be inundated by a 0.5% annual exceedence probability flood event on planning maps in District Plans, and controlling land-use activities in these areas in accordance with Policies 10-2, 10-3 and 10-~~5~~4.

This Policy relates to Issue 10-1 and Objective 10-1

4.6 Chapter 10 – Policy 10-2 Development in areas prone to flooding

Table of Submitters, Submission Points and Recommendations

Submitter	Number	Point	Decision Sought	Recommendation
G N S SCIENCE	31	9	GNS Supports Policy 10-2	Accept in part
	X 481	5	PALMERSTON NORTH CITY COUNCIL - Oppose	Accept in part
	X 495	191	RUAPEHU DISTRICT COUNCIL - Oppose	Accept in part
	X 500	47	TARARUA DISTRICT COUNCIL - Oppose	Accept in part
	X 507	47	MANAWATU DISTRICT COUNCIL - Oppose	Accept in part
	X 515	47	HOROWHENUA DISTRICT COUNCIL - Oppose	Accept in part
	X 517	55	RANGITIKEI DISTRICT COUNCIL - Oppose	Accept in part
	X 532	47	WANGANUI DISTRICT COUNCIL - Oppose	Accept in part
BERT JUDD	96	7	Not allow building houses in flood prone areas such as Te Matai flood prone country was before the twenties and still is today 2007.	Reject
CHRIS TEO - SHERRELL	181	4	Strongly support the proposal to require avoidance of the annual exceedence probability event to the 0.2% level for PNth.	Reject
CHRIS TEO - SHERRELL	181	5	Support the restriction on new development in areas mapped as floodways but believe that it should be an absolute restriction for residential development.	Accept in part
PALMERSTON NORTH CITY COUNCIL	241	92	That Horizons adopt Policy 10-2(a) that provides for generally not allowing any new development in areas mapped as floodways. That Horizons amend Policy 10-2(b) to better reflect the approach of the current RPS which provides for mitigation as an option and allows for decisions on flood hazard management to be individually optimised and justified by cost and benefit considerations.	Accept in part

Submitter	Number	Point	Decision Sought	Recommendation
	X 500	147	TARARUA DISTRICT COUNCIL - Support	Accept in part
	X 507	147	MANAWATU DISTRICT COUNCIL - Support	Accept in part
	X 515	147	HOROWHENUA DISTRICT COUNCIL - Support	Accept in part
	X 517	275	RANGITIKEI DISTRICT COUNCIL - Support	Accept in part
	X 532	147	WANGANUI DISTRICT COUNCIL - Support	Accept in part
MANAWATU DISTRICT COUNCIL	340	78	Policy 10-2b) needs to also mention impacts on response capability, and take into account impacts on the applicant's property as well as other properties.	Accept in part
	X 481	634	PALMERSTON NORTH CITY COUNCIL - Support	Accept in part
LANDLINK LTD	440	69	Submitter does not request a decision, however they do note: "We are somewhat perplexed by the adoption of a 0.5% AEP. Our understanding is that a more common approach is to add up to 14% to the 1% AEP after site specific analysis"	Reject
LANDLINK LTD	440	70	We suggest that the wording 1 in 200 year flood event is better than 0.5% annual exceedence probability for clarity.	Reject
LANDLINK LTD	440	71	Another approach to flood management could be to identify the 1% AEP and implement strict controls in these areas while using the 0.5% AEP around the 'edges' as management areas to ensure development is not unnecessarily restricted.	Reject
LANDLINK LTD	440	73	Policies 10-2; (b) [is] completely unworkable. It is essentially being proposed that settlements areas subject to flooding will not be allowed to grow. Mitigation is a viable option and this policy should be removed	Reject

4.6.1 Summary of submissions

- (a) Not allow buildings in flood-prone areas.
- (b) Support control of development in floodways. One submitter considers that there should be an absolute restriction on residential development in these areas.
- (c) Support for avoidance of development in areas subject to a 0.2%AEP flood event in Palmerston North.
- (d) Amend Policy 10-2(b) to better provide for mitigation as a flood management option where costs and benefits in specific cases are taken into consideration.
- (e) Amend Policy 10-2(b) to refer to response capability and impacts on property (applicants and other) as a consideration for development in floodable areas.
- (f) Uncertainty regarding the use of the 0.5% AEP flood level.
- (g) Use alternative wording to 0.5% AEP – refer to a ‘1 in 200 year flood event’.
- (h) Implement strict controls in areas subject to 1% AEP flood events and lesser controls within a wider 0.5% AEP area around the ‘edges’ of the primary floodable area.
- (i) General support.

4.6.2 Evaluation

- (a) The total exclusion of buildings in flood-prone areas is not considered to be appropriate as it does not recognise the variable levels of risk associated with different land uses and different sites. In some cases it may be appropriate to mitigate the effects of natural hazards where complete avoidance of the area is not appropriate. Some buildings, such as utility buildings and non-residential structures, may be appropriately located in floodable areas where the costs associated with the effects of a flood event on those buildings is accepted by the building owner or the wider community. To prohibit all buildings within floodable areas is not consistent with risk-based management of natural hazards.
- (b) Some submitters have given support to the control of development in floodways. Floodways are important flood hazard management facilities and it is therefore important that the function of those facilities is maintained. Establishing buildings and other development that may influence the way in which those facilities operate, and thereby impacting on the wider flood management scheme, is required to be avoided in the POP, except where there is a functional constraint that establishes a need for development to occur in that area.

Submitters request that residential development in floodways is absolutely restricted. In the majority of situations this is what the policy achieves without specifically referring to residential dwellings. Only development that has functional necessity to be located within floodways can be considered, and in the majority of situations it is unlikely that there would be a demonstrable functional constraint that requires that a dwelling be established in such an area. Any exceptional developments are provided for via the current Policy 10-3, which enables mitigation of effects where there is a functional requirement for a structure or activity

to be located within a floodway. Whether there is a 'functional requirement' for a particular building or use to be established in the floodway would be considered on a case by case basis taking into account the specific details of the proposal and the site.

I consider that the current policy framework makes it very unlikely that a residential dwelling could be established within a floodway, but that there is sufficient opportunity to do so should a functional requirement be demonstrated.

However, it is considered that the policy could be amended to clarify the intent by deleting the word 'generally'. The circumstances when the policy can be deviated from are provided in Policy 10-3 only, and the use of the word 'generally' creates potential confusion by suggesting that there may be other circumstances when development may be appropriate in these areas. I do not believe that that is the intention for the policy and removing the word 'generally' clarifies this.

- (c) Submitters support the avoidance of development in areas subject to a 0.2% AEP flood event in Palmerston North. It is noted that the POP specifies the 0.5% AEP flood event as the scale of event to which to be managed to. This does not prevent Palmerston North City Council managing urban expansion to a lower probability event where that is considered to be desirable by the local community. It is noted that the existing level of protection provided to the existing Palmerston North urban area is via stopbanks that provide mitigation to a 0.2% AEP flood event. Where the Palmerston North City Council considers allocating further land for residential use within areas prone to flooding, part of the decision made through the re-zoning process should consider the level of flood protection that is provided to the new urban areas. Please refer to the evidence of Peter Blackwood for an explanation as to the reason for using the 0.5% AEP flood event. The discussion and recommendations below in relation to managing the residual risk to a 0.2% AEP should also be noted, despite this not necessarily achieving the relief sought by the submitter.
- (d) Palmerston North City Council has requested that Policy 10-2(b) be amended to better provide for mitigation as a flood management option, where costs and benefits in specific cases are taken into consideration. As notified, Policy 10-2(b) has a preference for avoiding development in areas that are subject to a 0.5% AEP flood event. An exception to the avoidance approach is provided where it can be demonstrated that a list of effects will not occur. Submitters have raised concerns that the policy is primarily focussed on avoidance and that this approach does not recognise that consideration of individual proposals may find that the benefits to be derived from developing in a floodable area outweigh the potential costs to the community of accepting some degree of risk associated with flood events. Submitters argue that there may be cases where communities accept that there is a risk to property and/or human life associated with utilising resources for gain. Communities and individuals may consider that it is preferable to paying for insurance, clean-up and repair costs and the cost of erecting and maintaining stopbanks to protect development.

Avoiding an area that is potentially subject to a flood event is the easiest option for managing a flooding hazard, where the benefits of developing in that area are excluded from the equation. If development does not occur in a hazardous area, people and property are not put at risk and the hazard is effectively avoided. This approach potentially saves communities large amounts of money, and potentially saves lives, because there will be no costs associated with mitigating the hazard. Construction, maintenance and upgrading of stopbanks and other flood control structures is very expensive financially and also has potential to cause wider effects on the natural environment and other property through the displacement of flood flows, etc. Other mitigation options, which can include paying for insurance to cover potential losses, or paying directly for clean-up and repair costs after a flood event, are also potentially costly and do not prevent loss of life. Therefore the POP has been written to direct Territorial Authorities to consider avoidance as the first preference for flood hazard management.

However, the costs of mitigation of the hazard may be acceptable to a community where the benefits to be gained from using the area for development are significant. In the case of Palmerston North, where there is significant pressure for urban expansion to provide for homes and businesses, the benefits to the community derived from being able to provide sufficient housing and other assets could be significant. On the flip side, not providing for urban expansion could impose significant costs on the local community due to restrictions on economic growth or higher costs resulting from inefficiencies of developing less viable areas, such as areas that would require major infrastructure to be established.

Managing the risk associated with natural hazards requires complex considerations of the extent of that risk and also understanding the level of risk that the community is prepared to accept. The community risk profile may also change over time, depending on the value associated with particular areas or activities (an example would be where a flood-prone suburb sees increases in real estate prices and therefore the monetary cost to communities and individuals of flood damage may be greater than what it was). Depending on the outcomes of this investigation, avoidance or mitigation, or a combination of both, may be considered to be the most appropriate approach.

Another difficulty with managing flood hazard is that with the influence of climate change, and with improvements in knowledge about flood events, the extent and scale of flood events may change over time. This is problematic in relation to mitigation measures, such as the construction of stopbanks, because these measures may become less effective over time. Mitigation measures such as stopbanks also carry a risk of failure, which in some cases may result in a far greater loss of life or property than may have occurred had the area been allowed to flood at a natural rate (a large pulse of water from a catastrophic stopbank rupture could have major adverse effects). The risk that remains once a particular level of hazard has been avoided or mitigated is the residual risk.

Residual risk can result in greater demand for improved hazard mitigation measures over time that would not be necessary had

development in a flood-prone area been avoided from the outset. The cost of improving mitigation measures, such as increasing the size of stopbanks, is significant. Difficult decisions around balancing the costs to the community of increased protection versus the cost to the community of accepting the current level of risk have to be made.

Policy 10-2(b), as notified, was constructed to enable either the avoidance or mitigation options to be taken in managing natural hazards. However, the policy has been written with avoidance as the preference, as this is the simplest way to manage the hazard. It also minimises the need to avoid residual risk and the future demands for further mitigation that it brings. However, the option of mitigating the hazard is provided for where a specific set of strict conditions are met. This approach is supported by Objective 10-1, which seeks to avoid or mitigate natural hazards. It is also supported by the Explanation and Principal Reasons stated in Section 10.7".

Policy 10-2 generally seeks to avoid residential development and other new activities in areas likely to be affected by flooding, due to the risks to human life and property. It is recognised, however, that some activities have a functional constraint to be located in floodable areas (Policy 10-3), or that measures for dwellings and other activities, (eg. access outside of floodable area, and building design) can be put in place to avoid any increase in impacts of floods (Policy 10-2).

However, submitters have identified that there is difficulty with the Policy in that it will be almost impossible to meet the threshold of 'shall not cause' any of the listed effects. This wording implies that there can be no acceptance of some degree of risk in relation to the listed effects (as occurs when a hazard is mitigated rather than avoided), which may be considered appropriate by the community. The Policy states that effects must be prevented outright. I consider that the intention of the Policy is to prevent those effects, but only up to a level beyond which the community is comfortable about accepting some of the consequences of flooding. In other words, where avoidance of the hazard is not preferred, mitigation of the hazard may only occur where the residual risk is at a level that is acceptable – a level where people, property or infrastructure may be affected but not to a significant degree.

This approach applies equally to new development, such as greenfields residential subdivision, as it does to development in existing areas where in-fill housing may occur. In areas that have already been set aside for urban development, but which have a level of flood protection below the 0.5% AEP event, people owning land have an expectation to be able to use that land as intended at the time of purchase (ie. for urban land use purposes). Policy 10-2 does not however differentiate between development in rural or urban areas and cuts across District Plan zones, in recognition that the objective is to manage the flooding hazard regardless of the underlying development expectations. The Policy is intended to avoid or mitigate risk to life, property and infrastructure in all situations. The Policy does not prevent development in an area that is already allocated for a particular land use (eg. residential) but it does require the listed effects to be addressed and a level of residual risk to be achieved.

To provide more clarity that the intention of the Policy is to avoid development as a preference, but to enable the hazard to be mitigated provided a significant residual risk does not remain, it is recommended to amend Policy 10-2(b) to prescribe a specific residual risk standard to be achieved. The evidence of Peter Blackwood explains the management of residual risk and includes a recommendation for water depth and velocity that is generally regarded as being the limit in which people are able to move about in flood waters without significant immediate risk to life. This is a variable limit dependent on two variables – water depth and water velocity. As the depth of water increases, the risk to people and property increases. Also, as the velocity of the water increases, the risk to people and property increases. A combination of the two variables creates an overall risk – as the depth of water increases, the velocity below which it is safe for people to wade decreases.

As is described in Mr Blackwood's evidence, there is a linear relationship between water depth and water velocity. For the purposes of Policy 10-2, I recommend that the most conservative depth and velocity is specified, while providing an opportunity for other depth/velocity ratios to be proposed by developers where it can be demonstrated that the proposed ratio will adequately address the risk to life. Based on Mr Blackwood's evidence, the most conservative ratio is a water depth of 0.5 metre and a velocity of 1.0 metre per second.

As there will be a level of community acceptance that an extraordinary flood event may be devastating but has very little probability of occurring, a 'cap' on the residual risk of a 0.2% AEP flood is recommended. This is the equivalent of a 500 year return period flood. A margin for climate change to 2090 is also proposed to recognise that the 0.2% AEP flood will change over time. A further residual risk consideration is included, that being a flood mitigation measure failure occurring during a 0.5% AEP flood, such as a stopbank failing. This component recognises that mitigation measures such as stopbanks are vulnerable to failure and therefore the risk to people and property from such a failure should be at an acceptable level.

It is therefore recommended to amend the policy to provide an exception to the preferred flood hazard avoidance approach. I consider that the recommended changes clarify the intent of the originally notified Policy 10-2(b) in that where development is not avoided, mitigation may only take place where the overall risk to people and property is not significantly greater than avoiding the risk altogether.

Coupled with the recommended changes is a new term that will require addition to the Glossary. That term is 'residual inundation'. 'Residual inundation' is a term used to reflect the residual flood levels and velocities that are to be managed for. Mr Blackwood in his evidence explains the reason and foundation for the limits used in the recommended definition of 'residual inundation'.

- (e) Submitters seek to amend Policy 10-2(b) to refer to response capability and impacts on property (applicants, and other) as a consideration for development in floodable areas. The recommended changes to Policy

10-2(b) as described above are considered sufficient to encompass consideration of these matters. One of the mitigation measures that may be implemented as part of mitigating a flood hazard may be implementing appropriate response procedures to, for example, ensure people are evacuated during flood events. Likewise, the list of effects currently includes effects on infrastructure and the property of other people. However, the list of potential effects does not mention effects on the property that is the subject of the proposed development. In the case of large-scale urban development proposals, it is important that the flood hazard in relation to the proposed property is also considered. Therefore I recommend that the policy be amended to reflect that the risk to the property being established also needs to be considered.

- (f) As discussed in the evidence of Peter Blackwood, the use of the 0.5% AEP flood level incorporates a climate change factor on top of the 1% design flood event. The climate change factor is based on the expected climate change in the year 2050, which coincides closely with the 0.5% design flood event.
- (g) Submitters request that the POP use alternative wording to 0.5% AEP. It is requested that reference to a '1 in 200 year flood event' be used as it is considered more relevant and meaningful to readers. Mr Blackwood in his evidence explains why the Annual Exceedence Probability terminology is used instead of the x in y year flood. In summary, AEP is considered to be a more accurate description of the probability. Referring to a 1 in 200 year flood event misleads readers by suggesting that a certain sized flood will only occur once in every 200 years. Probability is more accurately represented as the percentage chance that a particular event will occur in any one year. For example, a 0.5% AEP flood has a 0.5% chance of occurring in any one year. I recommend that the AEP terminology is retained for accuracy purposes.
- (h) Submitter request that the POP impose strict controls in areas subject to 1% AEP flood events and lesser controls within a wider 0.5% AEP area around the 'edges' of the primary floodable area. As is discussed by Mr Blackwood in his evidence, the characteristics of flooding in any particular area are quite variable. The depth, velocity and duration of flooding can vary significantly over a short geographical area and will be influenced by topography and the characteristics of the flood flows. An area that is mapped as being affected by a 0.5% AEP flood event may experience very low water flow rates and minimal depth of flooding. However, an area only metres away may be affected quite differently by the same return period event and may experience high flows and deep water. Differentiating the level of restrictions on land uses based on the extent of certain return period flood events would not reflect the potential effects of those flood events. A particular probability flood event needs to be defined and land uses managed to address the site-specific implications of that scale of event. Therefore I do not agree with the submitter's request to utilise a variable approach to flood event probability.
- (i) Notwithstanding the comments and recommendations made above, the overall intent of Policy 10-2 is considered to be retained in the

recommended changes to the provisions. I therefore accept in part those submissions indicating support for Policy 10-2.

However, I also recommend that the term 'development' in the policy is replaced with 'structures or activities'. The term 'development' is not defined in the POP or in the RMA and there may be several interpretations of the term. In many cases, development refers to the establishment of roads, dwellings and infrastructure associated with subdivisions. However, development can also be read as meaning the act of establishing structures and activities. I consider that changing the reference to structures and activities removes some of the uncertainty as to the meaning of development, and creates consistency with the wording in other policies in the Chapter.

Other changes to the arrangement of the Policy are also recommended. The primary change is to integrate the originally notified Policy 10-3, which provided an exception to Policy 10-2 where there was a functional constraint, into Policy 10-2. This change is considered to improve the readability of the policies. The change also introduces a list of effects that need to be addressed when considering an exceptional circumstance as provided by the original Policy 10-3. As notified, Policy 10-3 refers to effects being avoided or mitigated, however this gave little guidance to POP users as to what those effects may be. The recommended Policy 10-2 identifies a list of effects that should be included in the consideration of proposals that pass any of the gateway tests specified in Policy 10-2.

As part of the recommended changes to Policy 10-2 to improve its readability, it is recommended to amend the listed effects to remove some of the repetition, particularly in (b)(iii) and (b)(iv).

4.6.3 Recommendation NH 6

- (a) Accept in part submissions requesting:
 - i. Clarification of the avoidance or mitigation requirements for flood hazards
 - ii. Changes to the reference to property
 - iii. Managing development in Palmerston North to a 0.2%AEP level
- (b) Reject submissions requesting:
 - i. Different management regimes for the 'edges' of floodable areas.
 - ii. Using an alternative to Annual Exceedence Probability
 - iii. Total avoidance of development in floodable areas.

4.6.3.1 Recommended changes to provision

- (a) Amend Policy 10-2 to:
 - (a) The Regional Council and Territorial Authorities shall prevent the establishment of any new structure or activity, or an increase in the scale of any existing structure or activity, within a floodway* mapped in Schedule I unless
 - (i) It is necessary to locate the structure or activity within such an area owing to functional constraints -

in which case the structure or activity may be allowed.

- (b) the Regional Council and Territorial Authorities shall prevent the establishment of any new structure or activity, or an increase in the scale of any existing structure or activity, within any other area likely to be inundated by a 0.5% annual exceedence probability flood event unless either—
- (i) it is necessary to locate the structure or activity within such an area owing to functional constraints; or
 - (ii) the residual inundation* of land within a privately owned property* or on a road will be no deeper than 0.5m above finished ground level with a maximum water velocity of 1m/s, or some other combination of water depth and velocity that can be shown to result in no greater risk to human life, infrastructure or property—
in which case the structure or activity may be allowed.
- (c) in circumstances where a structure or activity is allowed in accordance with clause (a) or clause (b), the following effects shall be avoided or mitigated:
- (i) any increase in risk to human life, infrastructure or property, except where these effects are adequately avoided or mitigated by managing the residual inundation* in accordance with clause (b)(ii);
and
 - (ii) any increase in flood risk; and
 - (iii) any reduction in the effectiveness of existing works or structures, including works and structures within River and Drainage Schemes, or natural landforms for avoiding or mitigating the effects of flood hazard events.
- (d) this Policy does not apply to new critical infrastructure*.

This Policy relates to Issue 10-1 and Objective 10-1.

- (b) Add the following term to the Glossary:

Residual inundation means innundation that will result if any one or both of the following occurs:

- i. a total or partial failure of the flood avoidance or mitigation measures occurs during a 0.5% annual exceedence probability (AEP) flood event,
- ii. a 0.2% annual exceedence probability (AEP) flood event occurs, the calculation of which accounts for climate change to the year 2090.

4.7 Chapter 10 – Policy 10-3 Activities that need to be located in areas prone to flooding

Table of Submitters, Submission Points and Recommendations

Submitter	Number	Point	Decision Sought	Recommendation
G N S SCIENCE	31	10	GNS Supports Policy 10-3	Accept in part
	X 494	17	RANGITIKEI AGGREGATES LTD - Oppose	Reject
PALMERSTON NORTH CITY COUNCIL	241	93	That Horizons adopt Policy 10-3.	Accept in part
	X 500	148	TARARUA DISTRICT COUNCIL - Support	Accept in part
	X 507	148	MANAWATU DISTRICT COUNCIL - Support	Accept in part
	X 515	148	HOROWHENUA DISTRICT COUNCIL - Support	Accept in part
	X 517	276	RANGITIKEI DISTRICT COUNCIL - Support	Accept in part
	X 532	148	WANGANUI DISTRICT COUNCIL - Support	Accept in part
RANGITIKEI AGGREGATES LTD	279	12	The following amendment is sought to Policy 10-3: An exemption to Policy 10-2 may be made for structures and activities that cannot be located outside floodways and other areas likely to be inundated by a 0.5% annual exceedance probability flood event because of functional constraints provided any adverse effects are avoided or mitigated. An example of such an activity would be gravel extraction activity that can assist with the removal of gravel in overburden reaches of a river.	Reject
	X 504	22	HIGGINS GROUP - Support	Reject
LANDLINK LTD	440	74	Policies 10-3 [is] completely unworkable. It is essentially being proposed that settlements areas subject to flooding will not be allowed to grow. Mitigation is a viable option and this policy should be removed.	Accept in part

4.7.1 Summary of submissions

- (a) Include specific reference to gravel extraction as an activity that cannot be located outside floodways and other areas likely to be inundated.
- (b) Remove Policy 10-3 as it will not allow settlements subject to flooding to grow.
- (c) General support for Policy 10-3.

4.7.2 Evaluation

- (a) Gravel extraction activities may fall within the exclusion created by Policy 10-3, particularly where the gravel extraction is being undertaken as an integral part of managing the Regional Council's flood mitigation works. However, given the variety of activities that may fall within the scope of Policy 10-3, and the need for the effects of activities (despite functional constraints requiring them to locate within a particular area) to be individually considered, I consider that it would be inappropriate to list individual activities such as gravel extraction, which in some situations may not be consistent with the Policy. For example, gravel extraction and stockpiling of gravel within a floodway may cause significant adverse effects on the floodway's ability to convey flood water during a flood. Therefore I do not consider that it is appropriate to list gravel extraction as an activity that should be able to take place within floodways.
- (b) The submitter is concerned that Policy 10-3 is unworkable and will not allow existing settlements to grow. Given my recommended changes to Policy 10-2 to incorporate the mitigation of flood hazard for new and expanded development, Policy 10-2 enables settlements to grow where the adverse effects associated with the flood hazard are avoided or mitigated. It does not provide for residential development within floodways, however, as this will generally be inappropriate as a 'functional constraint' that necessitates the development being located in a floodway would be difficult to demonstrate. Policy 10-3 provides for those activities that may need to locate within a floodway or a floodable area, as a result of their functional constraints, and is more relevant to infrastructure rather than urban development. I consider that the recommended amendments to Policy 10-2 resolve the submitter's concerns.
- (c) Submissions that provide general support for Policy 10-3 are agreed with and accepted to the extent that the implications of Policy 10-3 are retained despite the policy being integrated into Policy 10-2.
- (d) As discussed in section 4.6 of this report, it is recommended to integrate Policy 10-3 into Policy 10-2 to improve the readability of the policies. The recommended change also incorporates a list of effects that need to be considered when addressing proposals to establish activities in floodways or floodable areas, on the grounds that there is a functional constraint requiring them to do so. The inclusion of a list of effects will guide POP users and decision makers when considering proposals.

4.7.3 Recommendation NH 7

- (a) Reject submissions requesting the specific inclusion of gravel extraction.
- (b) Accept in part submissions requesting that Chapter 10 policies enable settlements subject to flooding to grow.
- (c) Accept in part submissions requesting that Policy 10-3 is supported or adopted.

4.7.3.1 Recommended changes to provision

- (a) Delete Policy 10-3 and integrate it into Policy 10-2. Please see Section 4.6 of this report for discussion on the recommended changes to Policy 10-2.

4.8 Chapter 10 – Policy 10-4 Critical infrastructure

Table of Submitters, Submission Points and Recommendations

Submitter	Number	Point	Decision Sought	Recommendation
G N S SCIENCE	31	11	GNS Supports Policy 10-4	Accept in part
VECTOR GAS LIMITED	115	8	Insert the following under section 10.4 Policies, Policy 10-4: Critical Infrastructure. "The placement of new critical infrastructure in an area likely to be inundated by a 0.5% annual exceedence probability flood event (including floodways mapped in Schedule I) or in an area likely to be affected by another type of natural hazard, shall be avoided unless there is satisfactory evidence to show that the infrastructure will not be adversely affected or cause any adverse effects on the environment in the event of a flood, or there are no other reasonable alternatives."	Accept in part
PALMERSTON NORTH CITY COUNCIL	241	94	That Horizons amend Policy 10-4 to exclude the proposed second bridge crossing or provide written confirmation to PNCC that in Horizons opinion there is no reasonable alternative to placing the second bridge crossing within an area prone to flooding.	Accept in part
	X 500	149	TARARUA DISTRICT COUNCIL - Support	Accept in part
	X 507	149	MANAWATU DISTRICT COUNCIL - Support	Accept in part
	X 515	149	HOROWHENUA DISTRICT COUNCIL - Support	Accept in part
	X 517	277	RANGITIKEI DISTRICT COUNCIL - Support	Accept in part
	X 532	149	WANGANUI DISTRICT COUNCIL - Support	Accept in part
POWERCO LIMITED	272	24	O1 Review of definitions and descriptions of terms such as "essential works" and critical infrastructure". See Submission P.	Reject

Submitter	Number	Point	Decision Sought	Recommendation
	X 511	379	TRUST POWER LIMITED - Support	Reject
WATER AND ENVIRONMENTAL CARE ASSN INC	311	60	10-4 INSERT We strongly recommend that the Foxton Beach Sea Wall decision be re-visited with specific reference to the supplied attachments.	Reject
MANAWATU ESTUARY TRUST	312	57	10-4 INSERT We strongly recommend that the Foxton Beach Sea Wall decision be re-visited with specific reference to the supplied attachments.	Reject
	X 515	286	HOROWHENUA DISTRICT COUNCIL - Oppose	Accept
GEORGE & CHRISTINA PATON	313	57	10-4 INSERT We strongly recommend that the Foxton Beach Sea Wall decision be re-visited with specific reference to the supplied attachments.	Reject
TRANSIT NEW ZEALAND	336	25	That the term 'critical infrastructure' be defined in Glossary 3 of the plan to include state highways.	Reject

4.8.1 Summary of submission points

- (a) Amend the policy to address the potential limitations that the words ‘there is no reasonable alternative’ create.
- (b) Amend definition of terms such as ‘essential works’ and ‘critical infrastructure’, including to specifically referring to state highways.
- (c) Revisit the resource consent decision for the Foxton sea wall.
- (d) General support.

4.8.2 Legislative assessment

The CDEM Act identifies ‘lifeline utilities’ which are utilities that provide important or essential services to the community during and after a civil defence emergency. Schedule 1 of the CDEM Act lists a number of specific entities, including radio and television broadcasters, airports and sea ports. It also lists a number of entities that provide network utilities such as gas, electricity, water, sewerage, etc.

Each lifeline utility has a duty under s60(a) of the CDEM Act in that it must “*ensure that it is able to function to the fullest possible extent, even though this may be at a reduced level, during and after an emergency*”. The CDEM Act therefore places significant onus on lifeline utilities themselves to design and operate their infrastructure in a way that enables them to fulfil their duty under s60.

4.8.3 Evaluation

- (a) Submitters have raised concern with the use of the phrase ‘there is no reasonable alternative’. Submitters are concerned that there are often alternatives for a proposed development that may be as appropriate as the proposed development (either location or design) but that there should not be an obligation to avoid building the infrastructure in the preferred location on the grounds that there is a reasonable alternative. For example, the preferred design and location for a second bridge over the Manawatu River to serve Palmerston North may be restricted because there is a reasonable alternative location and/or design that is available (perhaps a location or alignment as little as metres from the preferred alignment). The wording of the Policy as notified effectively prohibits development of infrastructure where there is a reasonable alternative, which there will be in many cases.

The Policy is intended to provide clear guidance to local authorities, communities and infrastructure providers that important infrastructure should be located and/or designed to avoid potential natural hazard areas as a preference. This is because this infrastructure is critical for communities to function, particularly in the event of a natural disaster, and the cost and impact on a large number of people would be significant if the infrastructure were to be damaged or destroyed.

However, important infrastructure such as bridges for road and rail, by their nature, has to be located in areas that are subject to natural hazards. It is therefore recommended that the policy be amended to provide for

infrastructure to be established in natural hazard areas where there is a functional requirement for this, and where the infrastructure is designed to avoid or mitigate the effects of the hazard. For example, a new bridge serving Palmerston North City and forming part of the strategic road network needs to be located in an area subject to flooding, but it should be designed to withstand the design flood event to ensure that it continues to provide the important community service for which it is designed.

It is also recommended to include a list of potential effects of the infrastructure on the hazard. The recommended list of effects is not exhaustive but it includes specific effects that the often large-scale structures associated with critical infrastructure are likely to cause. Again, the example of a bridge being constructed as part of the strategic road network would involve considering whether the structure would trap debris and cause significant up-stream flooding, and whether any failure of the bridge would result in significant down-stream effects. The list of effects is not exhaustive and does not exclude other effects (such as those listed in Policy 10-2) being taken into account in assessing any proposal. Mr Blackwood in his evidence describes the effects that need to be considered when assessing proposals for new infrastructure within hazardous areas.

- (b) Submitters seek to amend the definition of 'essential works' and 'critical infrastructure'. The phrase 'essential works' is not used in this chapter of the POP, and will be addressed in planning reports on other chapters.

The term 'critical infrastructure' is not used elsewhere in the POP and it the term in the context of natural hazards is intended to encompass the key pieces of infrastructure that are essential for communities to continue to function. This list does not include 'lifeline utilities' as defined in the CDEM Act – in fact the notified definition specifically excludes networks (such as water and sewerage networks) that connect communities to the critical infrastructure. The policy is intended to discourage the establishment of those activities within hazard-prone areas rather than to provide protection of those pieces of infrastructure from other activities. More discussion on the infrastructure listed in the Glossary under the definition of Critical Infrastructure is addressed in Section 4.18 of this report.

- (c) Submitters ask that the resource consent decision for a sea wall at Foxton Beach is revisited as part of the POP development process. The POP notification and hearing process does not provide an opportunity for resource consents to be considered or reconsidered. This request is therefore outside the scope of the POP.
- (d) Submissions offering general support for the Policy are agreed with, except where changes are recommended to address matters raised in other submissions. Further changes to the policy are recommended to improve the clarity of the policy.

4.8.4 Recommendation NH 8

- (a) Accept in part submissions requesting clarification in the Policy as to when critical infrastructure may be located in hazard-prone areas.

- (b) Reject submissions requesting changes to the definition of 'critical infrastructure' and revisiting a previous resource consent decision.

4.8.4.1 Recommended changes to provisions

- (a) Amend Policy 10-4 to:

Policy 10-4: Critical infrastructure

(a) The Regional Council and Territorial Authorities shall prevent the establishment ~~The placement~~ of new critical infrastructure* within an area likely to be affected by a natural hazard event, including the floodways* mapped in Schedule I and other areas likely to be inundated by a 0.5% annual exceedence probability flood event ~~(including floodways mapped in Schedule I)~~, or in an area likely to be affected by another type of natural hazard, shall be avoided unless there is no reasonable alternative. —

- (i) it is necessary to locate the critical infrastructure* within such an area owing to functional constraints; and
- (ii) the critical infrastructure* is designed so that the adverse effects of the natural hazard event on the critical infrastructure* are avoided or mitigated—

in which case the critical infrastructure* may be allowed.

(b) in circumstances where critical infrastructure* is allowed in accordance with clause (a), the following effects shall be avoided or mitigated:

- (i) any restriction to flood flows and any consequential increase in upstream flood levels of flow velocities; and
- (ii) any change in the course of flood flows; and
- (iii) any entrapment of flood debris; and
- (iv) any increase in erosion or scouring during flood events; and
- (v) any effect arising from a failure of the infrastructure* in the vicinity or, in the case of flooding, downstream where it may cause or exacerbate a debris blockage.

This Policy related to Issue 10-1 and Objective 10-1

4.9 Chapter 10 – Policy 10-5 Other types of natural hazards

Table of Submitters, Submission Points and Recommendations

Submitter	Number	Point	Decision Sought	Recommendation
G N S SCIENCE	31	13	[in relation to policy 10-5] Thought also needs to be given as to how the effectiveness of proposed mitigation measures will be measured, to ensure the mitigation does reduce the risk to people and property, and not increase it.	Reject
G N S SCIENCE	31	14	[in relation to policy 10-5] Issues around residual risk also require consideration.	Reject
PALMERSTON NORTH CITY COUNCIL	241	95	That Horizons adopt Policy 10-5.	Accept in part
	X 492	176	MINISTER OF CONSERVATION - Support	Accept in part
	X 500	150	TARARUA DISTRICT COUNCIL - Support	Accept in part
	X 507	150	MANAWATU DISTRICT COUNCIL - Support	Accept in part
	X 515	150	HOROWHENUA DISTRICT COUNCIL - Support	Accept in part
	X 517	278	RANGITIKEI DISTRICT COUNCIL - Support	Accept in part
	X 532	150	WANGANUI DISTRICT COUNCIL - Support	Accept in part
ENVIRONMENT NETWORK MANAWATU	356	38	ENM seeks clearer direction regarding other hazards	Reject

4.9.1 Summary of submission points

- (a) Thought needs to be given to measuring the effectiveness of mitigation measures to ensure the risk to people and property is not increased.
- (b) Consideration needs to be given to managing residual risk.
- (c) Clearer direction in relation to other hazards.
- (d) Adopt Policy 10-5.

4.9.2 Evaluation

- (a) Assessing the risk associated with a particular development will occur on a case-by-case basis as the characteristics of the proposal are developed. In order to mitigate the risk, a clear understanding of the risk first needs to be established, as well as a means of determining what mechanisms are required in order to mitigate it. This will necessarily require people to consider whether the proposed mitigation measures will actually be effective in achieving the outcome, and will generally involve the advice of technical experts.

Given the wide range of developments, hazards and degrees of risk likely to be encountered when applying this policy, it is not considered appropriate to provide any particular guidance for confirming that proposed mitigation will actually achieve the mitigation suggested.

- (b) Management of residual risk, being risk associated with existing development in existing hazardous areas and the remaining risk once mitigation measures are in place, is an important consideration for local authorities. This is particularly relevant where the hazard is poorly understood or the level of information about the hazard is limited. As better information and understanding of hazards is developed, areas that were previously not considered to be at risk may now fall within a hazard area.

In the majority of situations where residual risk exists, readiness, response and recovery efforts will generally be more applicable to existing development than reduction. In most cases, management of residual risk will be through the CDEM Group Plan by way of information to potentially affected people. The POP provides opportunity for residual risk to be managed to some degree, through the provision of information in other methods. However, it is not considered necessary to amend Policy 10-5 to account for this. Residual risk should also be assessed at the time the overall risk profile is considered, and the requirement of the policy in (a) to consider 'any increase in risk' provides sufficient scope for residual risk to be considered.

- (c) The mapping of other natural hazards affecting the Region is provided for in Method – Hazards Research, which provides for the investigation, identification and mapping of natural hazard areas in the Region. The level of information about different natural hazards varies and it takes significant time and resources to develop comprehensive information on these hazards. The Regional Council has been undertaking significant modelling and mapping work for the flood hazard in the Region, but has

also been involved in research on tsunami run-up, earthquake, liquefaction and other hazards to lesser degrees.

The complexity and time involved in developing information on natural hazards means that the information available improves over time. The Council has committed to developing and providing information via the methods in the POP, but also as a member of the CDEM Group. As information becomes available and is disseminated to local authorities and other organisations, the management of hazards will change over time as the better knowledge and understanding is interpreted into District Plans and other management tools. Until full information is available, people and local authorities need to manage activities based on the best knowledge currently available. No changes to the policy are recommended.

- (d) Submissions requesting that the policy is adopted are supported.
- (e) It is recommended to make a minor amendment in the form of a note to indicate that this Policy relates to Issue 10-1 and Objective 10-1. It is also recommended to include reference to the Regional Council and Territorial Authorities, to provide greater certainty that the policy is to be implemented by those organisations.

4.9.3 Recommendation NH 9

- (a) Reject submissions requesting:
 - i. changes to the Policy to account for measuring effectiveness of mitigation measures
 - ii. management of residual risk
 - iii. clarification of management of other hazards
- (b) Accept submissions requesting that Policy 10-5 be adopted.

4.9.3.1 Recommended changes to provision

- (a) Amend the first paragraph of Policy 10-5 to:

The Regional Council and Territorial Authorities shall manage future development and activities in areas susceptible to natural hazard events (excluding flooding) shall be managed in a manner which:

- (b) Add the following to the end of Policy 10-5:

This Policy relates to Issue 10-1 and Objective 10-1

4.10 Chapter 10 – Policy 10-6 Climate Change

Table of Submitters, Submission Points and Recommendations

Submitter	Number	Point	Decision Sought	Recommendation
G N S SCIENCE	31	15	Policy 10-6 is strongly supported	Accept in part
	X 492	177	MINISTER OF CONSERVATION - Support	Accept in part
SUSTAINABLE WHANGANUI	176	27	The effect of climate change should not be underestimated.	Accept in part
PALMERSTON NORTH CITY COUNCIL	241	96	That Horizons adopt Policy 10-6 and note that Policy 10-6(f) specifically refers to flood mitigation efforts as opposed to flood avoidance efforts.	Accept in part
	X 500	151	TARARUA DISTRICT COUNCIL - Support	Accept in part
	X 507	151	MANAWATU DISTRICT COUNCIL - Support	Accept in part
	X 515	151	HOROWHENUA DISTRICT COUNCIL - Support	Accept in part
	X 517	279	RANGITIKEI DISTRICT COUNCIL - Support	Accept in part
	X 532	151	WANGANUI DISTRICT COUNCIL - Support	Accept in part
WINSTONE PULP INTERNATIONAL LTD	288	29	WPI requests that Policy 10-6 be retained.	Accept in part
	X 501	55	ERNSLAW ONE LTD - Support	Accept in part
ENVIRONMENT NETWORK MANAWATU	356	40	ENM seeks how the effects climate change will be managed.	Reject
ENVIRONMENT WAIKATO	385	12	Environment Waikato supports the taking of a precautionary approach to climate change as is provided for in Policy 10-6.	Accept in part

Submitter	Number	Point	Decision Sought	Recommendation
LANDLINK LTD	440	75	<p>[Rewrite Policy 10-6 to:]</p> <p>Consideration shall be given to the effects of climate change and sea level rise on natural hazards, the precautionary principle shall be applied to decisions on:</p> <ul style="list-style-type: none"> (a) stormwater discharges and effluent disposal (b) coastal development and coastal land use (c) activities adjacent to rivers and streams (d) water allocation and water takes (e) activities on Highly Erodible Land (f) flood mitigation works (g) managing storm surge 	Accept in part
COLIN BOND	470	10	<p>I submit that we have responsibility to take any reasonable steps to moderate the effects of natural events and but that we must guard against extreme actions advocated by groups or individuals who wish to force their views, disruption and the associated expenses on others.</p>	Accept in part

4.10.1 Summary of submission points

- (a) Re-word the policy to provide greater clarity.
- (b) General support for the policy.

4.10.2 Evaluation

- (a) I agree in part with the submitter's request to amend the policy wording to improve clarity. In particular, the reference to 'unsustainable hill country' should be amended to just 'hill country'. While areas within the Highly Erodible Land (now recommended through the hearing on Land (Chapter 5) to be Erosion Management Areas) are likely to have a higher risk of erosion due to climatic changes, all hill country has the potential for erosion given different rainfall events. I also recommend that the reference to 'storm surge' be deleted as storm surge is not an activity that can be managed. It is a natural phenomenon and typically falls within the scope of managing coastal development.

Several submitters (primarily Territorial Authorities) request that Policy 10-6 provide clearer direction to Territorial Authorities on how to manage for sea level rise and climate change (see submission points 172/58, 280/61, 291/40, 291/41, 340/76, and 346/58 in Section 4.1 of this report).

The intent of the Policy 10-6 as notified is to require local authorities to take a precautionary approach to decision-making in relation to hazards which are likely to alter in their scale, intensity or extent as a result of climate change or sea-level rise. The Policy recognises that there is uncertainty about the scale of changes to natural hazards that will result from sea-level rise, but also that the amount and quality of information about these changes will improve over time. The policy is intended to provide Territorial Authorities and the Regional Council with clear guidance that consideration needs to be given to the changing circumstances around climatically influenced natural hazards when providing for land use activities, and that it is not sufficient to only implement response mechanisms to natural hazard events on the basis of limited information.

Consideration of this potential change is important particularly where development or land use will be in place for a long period of time (such as residential subdivision). Failing to consider changes to natural events over time may result in avoidance or mitigation measures being inadequate within a short period. An example would be establishing a subdivision within an area that will be protected by a stopbank which has only been designed to the current 0.5% AEP flood event, without including an additional margin for changes in the scale of flooding over time. As a result of climate change, the stopbank may be inadequate to protect the subdivision over a longer period of time.

However, the Policy cannot be specific about the measures that need to be taken in each case, and the best information available at the time in relation to the hazard being managed over time will need to be applied to the decision-making process.

The only way I can currently see to improve the certainty of the Policy is to provide specific parameters, such as a minimum coastal setback distance within which developers would need to undertake site-specific assessments of the hazard risk. However, the significant variability between locations means that this cannot be done effectively at a regional scale and is best applied by Territorial Authorities at a local level if there is sufficient information to do so.

Therefore I do not consider that Policy 10-6 is able to be clarified or made more prescriptive, as the application of the policy on a site-by-site basis will change over time as better information becomes available and greater certainty is achieved.

To improve the certainty of the Policy, I recommend inclusion of wording to specify that it is the Regional Council and Territorial Authorities who are responsible for implementing the Policy.

With regard to the wording to the remainder of the Policy, I consider that it is currently sufficiently clear that a precautionary approach is the preferred approach.

- (b) Submissions that providing general support for the Policy or seeking it is adopted or retained are accepted.

4.10.3 Recommendation NH 10

- (a) Accept in part submissions that request:
 - i. clarification of wording in relation to hill country
 - ii. retention of the policy
- (b) Reject submissions requesting the Policy provide clearer guidance to Territorial Authorities in relation to managing sea-level rise and climate change.

4.10.3.1 Recommended changes to provision

- (a) Amend Policy 10-6 to:

~~The Regional Council and Territorial Authorities shall take a precautionary approach shall be taken for managing the effects of climate change and sea level rise*, and any associated changes to the scale and frequency of natural hazards, in particular for:~~

- (a) stormwater discharges and effluent disposal,
- (b) coastal development and coastal land use,
- (c) activities adjacent to rivers and streams,
- (d) water allocation and water takes,
- (e) activities on or near ~~unsustainable~~ hill country, and
- (f) flood mitigation ~~efforts~~ activities, and
- (g) ~~storm surge~~.

This Policy relates to Issue 10-1 and Objective 10-1

4.11 Chapter 10 - Method – Hazards Research

Table of Submitters, Submission Points and Recommendations

Submitter	Number	Point	Decision Sought	Recommendation
G N S SCIENCE	31	18	GNS Science supports hazard research, including investigations of hazards, risks and consequences	Accept
G N S SCIENCE	31	21	Methods related to provision of natural hazards information to Territorial Authorities and the public are supported.	Accept
RUAPEHU DISTRICT COUNCIL	151	122	(vii) Regional Council to retain the method stated in Section 10.5 of the One Plan.	Accept
	X 481	187	PALMERSTON NORTH CITY COUNCIL - Support	Accept

4.11.1 Summary of submission points

- (a) General support.

4.11.2 Evaluation

- (a) I agree with the submissions recommending that Method – Hazards Research be retained. To maintain consistency with recommended formatting changes from hearings on previous chapters, a Method numbering system is proposed, as are other minor amendments.
- (b) The introductory paragraph to the Methods section does not accurately reflect the content of the section. I therefore recommend that it be amended to simply explain that the Methods within the section are non-regulatory methods for implementing the policies of Chapter 10.

4.11.3 Recommendation NH 11

- (a) Accept submissions requesting that the method be retained.

4.11.3.1 Recommended changes to provision

- (a) Amend Method – Hazards Research and the introduction to the Methods section to:

~~The Regional Council is managing the environmental impacts of natural hazards from the following non-regulatory approach:-~~

The following are non-regulatory Methods to implement the Policies of Chapter 10:

Project Name Method 10-1	Hazards Research
Project Description	This project Method provides for the investigation, identification and mapping of those parts of the Region that are at risk from natural hazards, including seismic, volcanic, subsidence, tsunami flooding and coastal erosion hazards. It includes ing consideration of sea level rise* and climate change implications on those hazards. This information will be provided to Territorial Authorities for District Planning purposes and to other interested parties, and maps will be updated as required.
Who	Civil Defence and Emergency Management Group, Regional Council, Territorial Authorities and research institutes.
Links to Policy	This project links to Method implements Policies 10-1, 10-54 and 10-75.
Target	Hazards are mapped by 2010 and updated regularly as required.

4.12 Chapter 10 – Method - Floodable Areas Research

Table of Submitters, Submission Points and Recommendations

Submitter	Number	Point	Decision Sought	Recommendation
G N S SCIENCE	31	19	It would be expected that outcomes of climate change research will be incorporated into flood hazard models.	Accept in part
G N S SCIENCE	31	24	Methods related to provision of natural hazards information to Territorial Authorities and the public are supported.	Accept
RUAPEHU DISTRICT COUNCIL	151	125	(vii) Regional Council to retain the method stated in Section 10.5 of the One Plan.	Accept in part
	X 481	190	PALMERSTON NORTH CITY COUNCIL - Support	Accept in part

4.12.1 Summary of submission points

- (a) An expectation that the climate change research will be integrated into flood hazard modelling.
- (b) General support.

4.12.2 Evaluation

- (a) I agree with the requests of submitters in relation to this Method. The modelling techniques that will be used by the Regional Council to develop updated maps are understood to include climate change adjustment factors, as has been outlined in the evidence of Mr Blackwood. Integrating climate change data into the modelling of the flood hazard is likely to be more efficient and certain than requiring Territorial Authorities and others to add in a factor for climate change on maps provided to them.

I recommend that the Method be retained but with minor amendments to reflect the integration of climate change information into flood modelling and to improve the readability of the Method.

4.12.3 Recommendation NH 12

- (a) Accept in part submissions requesting:
 - i. clarification that climate change will be factored into flood area modelling.
 - ii. retention of the method.

4.12.3.1 Recommended changes to provision

- (a) Amend Method – Floodable Areas Research to:

Project Name-Method 10-2	Floodable Areas Research
Project Description	A region-wide study of floodable areas, <u>which incorporates climate change influences</u> , will be carried out to update flood maps and information in order to assist Territorial Authorities in the development of District Plans, and the Regional Council's advice service.
Who	Civil Defence and Emergency Management Group, Regional Council, and research institutes.
Links to Policy	This project links to <u>Method implements</u> Policies <u>10-1, 10-2, 10-3, 10-4 and 10-65</u> .
Target	Hazards are mapped by 2010 and updated as required.

4.13 Chapter 10 – Method - Natural Hazard Information and Advice

Table of Submitters, Submission Points and Recommendations

Submitter	Number	Point	Decision Sought	Recommendation
G N S SCIENCE	31	23	Methods related to provision of natural hazards information to Territorial Authorities and the public are supported.	Accept in part
RUAPEHU DISTRICT COUNCIL	151	124	(vii) Regional Council to retain the method stated in Section 10.5 of the One Plan.	Accept in part
	X 481	189	PALMERSTON NORTH CITY COUNCIL - Support	Accept in part

4.13.1 Summary of submission points

- (a) General support.

4.13.2 Evaluation

- (a) I agree with the requests of submitters in relation to this Method. I recommend that minor amendments are made to the method to improve readability.

4.13.3 Recommendation NH 13

- (a) Accept in part submission supporting the Method.

4.13.3.1 Recommended changes to provision

- (a) Amend Method – Natural Hazard Information and Advice to:

<u>Project Name</u> <u>Method 10-3</u>	Natural Hazard Information and Advice
<u>Project Description</u>	The Regional Council will provide Territorial Authorities and other interested parties with up-to-date natural hazard information to assist in the assessment of land development <u>resource consents applications</u> , particularly subdivisions.
<u>Who</u>	Regional Council.
<u>Links to Policy</u>	This project links to <u>Method implements</u> Policies 10-1, 10-2, 10-3, 10-4, <u>and</u> 10-5, 10-6 and 10-7 .
<u>Target</u>	Ongoing advice to Territorial Authorities and other interested parties.

4.14 Chapter 10 – Method - Public Information - Natural Hazards

Table of Submitters, Submission Points and Recommendations

Submitter	Number	Point	Decision Sought	Recommendation
G N S SCIENCE	31	22	Methods related to provision of natural hazards information to Territorial Authorities and the public are supported.	Accept
RUAPEHU DISTRICT COUNCIL	151	123	(vii) Regional Council to retain the method stated in Section 10.5 of the One Plan.	Accept
	X 481	188	PALMERSTON NORTH CITY COUNCIL - Support	Accept
BRUCE & MARILYN BULLOCH	237	16	Add to this project by incorporating the signposting of potential hazards. (E.g. notices warning of tsunami risks on coast, potential for cliff collapse in popular picnic areas)	Reject
MANAWATU BRANCH OF N Z GREEN PARTY	433	52	Add to this project by incorporating the above request for signposting of potential hazards.	Reject

4.14.1 Summary of submission points

- (a) General support.
- (b) Include reference to signposting of potential hazards.

4.14.2 Evaluation

- (a) I agree with the requests of submitters supporting this method.
- (b) Providing signposting and warning information at particular sites will be an appropriate technique in some locations and for some hazards. However, providing a requirement in the POP, which is a regional-level guiding document, is considered to be too specific. There is a large number of public information tools available to be used to implement this Method and I do not consider that it would be helpful to readers to specify all of these tools within the POP. The precise public information tools to be used in each situation should be addressed on a case-by-case basis, taking into account a range of factors such as the number of people that need to be informed, the nature of the hazard, the level of risk, and the physical extent of the hazardous area. I consider that the Method is currently broad enough to enable signposting to be used where appropriate. Therefore I do not recommend making changes to the Method other than to improve readability and to clarify that climate change is not a hazard in itself but may influence hazards.

4.14.3 Recommendation NH 14

- (a) Accept submissions that generally support the method.
- (b) Reject submissions requesting reference to signposting of potential hazards.

4.14.3.1 Recommended changes to provision

- (a) Amend Method – Public Information – Natural Hazards to:

Project Name <u>Method 10-4</u> Public Information – Natural Hazards	
Project Description	Easily accessible information will be developed and provided to increase public awareness of the risks of natural hazards, including seismic, volcanic, subsidence, tsunami, flooding, and coastal erosion, and climate change hazards, and the effects of climate change. Up-to-date natural hazard information will be provided to the general public and other interested parties (for example, advance warning flood and lahar systems and civil defence literature), together with advice on appropriate options for avoiding or mitigating natural hazards.
Who	Civil Defence and Emergency Management Group, Regional Council, Territorial Authorities, research institutes and other relevant agencies.
Links to Policy	This project links to <u>Method implements</u> Policies 10-1, 10-2, 10-3, 10-4, and 10-5, 10-6 and 10-7.
Target	Information provided via website and available in paper form by 2010.

4.15 Chapter 10 – Anticipated Environmental Result – Table 1, Row 1

Table of Submitters, Submission Points and Recommendations

Submitter	Number	Point	Decision Sought	Recommendation
G N S SCIENCE	31	25	A desirable environmental result relating to the public's awareness of hazards and how to cope with hazard events could also include of the following indicators: the inclusion of hazard areas on planning maps, the establishment of community liaison groups for pre-event recovery planning, community meetings held to discuss local hazards issues, community surveys to measure levels of public understanding of hazards and risks etc	Accept in part

4.15.1 Summary of submission points

- (a) Suggest that several additional indicators could be added to measure Anticipated Environmental Results (AERs).

4.15.2 Evaluation

- (a) Other than community surveys, the other indicators proposed by the submitter would provide limited data with which to measure the achievement of the Anticipated Environmental Results. The establishment of community liaison groups and community meetings is a useful and often effective method for achieving the results, but does not necessarily provide effective measurement indicators. Attendance and membership of such groups and meetings may be highly variable so holding say 10 community meetings may involve hundreds of people or only a few.

The inclusion of hazard areas on planning maps, and rules in District Plans controlling land use activities in hazard-prone areas, would be an indicator of a level of control over activities in high-risk areas. This information would assist in determining whether a level of scrutiny is being applied to development proposals, in order to reduce the risk to property and life and would therefore be of assistance to determining how and why activities may be establishing in hazardous areas. Therefore I recommend including an additional indicator which refers to the inclusion of hazardous areas on planning maps and regulation of land use activities in those areas.

I agree that the use of community surveys would be a useful tool for measuring Anticipated Environmental Results and this data source is already identified in the table (in row 2).

I note that the list of indicators and data sources is not exhaustive and some of the indicators suggested by the submitter may still be used where the data is considered appropriate.

4.15.3 Recommendation NH 15

- (a) Accept in part the submission requesting that additional indicators be added to the Anticipated Environmental Results table.

4.15.3.1 Recommended changes to provision

- (a) Amend Row 1 of the Anticipated Environmental Results table to:

Anticipated Environmental Result	<u>Links to Policies and Methods</u>	Indicator	Data Source
By 2017, the risk to people, property and critical infrastructure will be the same or less than before this plan became operative.	Natural Hazards Policies: 10-1, 10-2, 10-3, <u>10-4</u> , <u>10-5</u> , <u>10-6</u> and 10-	<ul style="list-style-type: none"> The number of new dwelling houses in floodable areas 	<ul style="list-style-type: none"> Territorial authorities. Operations Group maintenance records.

	<p>47. <u>Methods: 10-1, 10-2 and 10-3</u> Land Policies: 5-1, 5-2, 5-3 and 5-5. Water Policies: 6-29, 6-31, 6-33 and 6-34.</p>	<p>consistent with policy 10-2.</p> <ul style="list-style-type: none"> • Number of incidents where activities are affecting Schemes, especially stop banks. • Natural Hazard information shared with Territorial Authorities and interested parties. • <u>District plans incorporating hazardous areas on planning maps and associated regulation of land use in those areas.</u> 	<ul style="list-style-type: none"> • Compliance database. • Incidents database.
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4.16 Chapter 10 – Anticipated Environmental Result – Table 1, Row 2

Table of Submitters, Submission Points and Recommendations

Submitter	Number	Point	Decision Sought	Recommendation
MANAWATU BRANCH OF N Z GREEN PARTY	433	51	Incorporate this into 10.6 Anticipated Environmental Results (paragraph 2) (page 10-6) [Decision 433/50 Extend the scope of 10.1 (a) (I) (page 10-3) Monitoring if people are in fact prepared for emergencies, such as by phone survey.	Accept in part

4.16.1 Summary of submission points

- (a) Include monitoring to determine people’s preparedness for emergencies.

4.16.2 Evaluation

- (a) Monitoring for preparedness is considered to be a component of monitoring people’s ability to cope with a hazard. Coping with a hazard encompasses not only the response once a natural event occurs, but also how well people are prepared to cope when a disaster occurs. I consider that this is implicit in the existing wording but that it would assist plan users to include reference to preparedness.

Public surveys are already specified in the Anticipated Environmental Results table as a data source to determine whether people are more aware of hazards. It is considered that the submitter’s request is already met by the existing wording in the AER table and therefore I do not recommend making a further specific reference to phone surveys.

The AER in Row 2 of the table is certainly related to the provision of information and managing land use activities in areas prone to natural hazards. However, I note that the majority of the preparedness and response to natural hazard events is managed through the responsibilities of various organisations under the CDEM Act. Therefore any monitoring undertaken as part of those responsibilities will also inform the AERs of the POP.

4.16.3 Recommendation NH 16

- (a) Accept in part the submission requesting reference to preparedness.

4.16.3.1 Recommended changes to provision

- (a) Amend Row 2 of the Anticipated Environmental Results to:

<p>By 2017, people will be more aware of the risks of natural hazards in the Region and how to <u>prepare for and cope with them</u> than they were before this Plan became operative.</p>	<p>Natural Hazards Policies: 10-1, 10-2, <u>10-3</u> and <u>10-3-4</u>. Methods: 10-1, <u>10-2</u>, 10-3 and <u>10-4</u></p>	<ul style="list-style-type: none"> • Public perception • Number of requests for information 	<ul style="list-style-type: none"> • Customer surveys • SED database
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4.17 Chapter 10 – Explanations and Principal Reasons

Table of Submitters, Submission Points and Recommendations

Submitter	Number	Point	Decision Sought	Recommendation
RANGITIKEI AGGREGATES LTD	279	13	The following amendment is sought to paragraph 5 of the Explanation and Principal Reasons in Chapter 10: Policies 10-2, 10-3 and 10-5 also include provisions seeking to ensure that the effectiveness of existing hazard mitigation measures is not undermined by future activities. It is acknowledged that due to the nature of gravel extraction, and the benefit that the activities have on flood management, it may be appropriate to locate such activities in areas prone to flooding.	Reject
	X 504	23	HIGGINS GROUP - Support	Reject

4.17.1 Summary of submission points

- (a) Include reference to gravel extraction activities and their benefits for managing flood control works.

4.17.2 Evaluation

- (a) As discussed previously, gravel extraction is one of a range of activities that may need to be located within floodable areas or floodways. However, it is not considered necessary to list this or other activities, particularly where some gravel extraction activities may not necessarily be appropriate due to other adverse effects on the environment. Gravel extraction activities, as with other activities, should be considered on a case-by-case basis to determine their appropriateness to be located in hazard-prone areas. As such, I do not agree with the submitter's request to amend Chapter 10, including the explanatory text, to refer to gravel extraction specifically.

To reflect recommend changes to Policy 10-2, including the insertion of a new Policy 10-3, I recommend that the explanatory text in relation to Policy 10-2 is amended accordingly to reflect the changes. I also recommend other minor changes to improve readability (please refer to the attached tracked changes document).

4.17.3 Recommendation NH 17

- (a) Reject the submission requesting reference to gravel extraction.

4.17.3.1 Recommended changes to provision

- (a) To reflect recommended changes to Policy 10-2, amend the third paragraph of Explanation and Principal Reasons to:

Policy 10-2 targets floodways and floodable areas, as flooding is the most significant natural hazard in the Region. Floodable areas are defined as those areas that would be inundated by a 0.5% annual exceedence probability flood event. This is a change from the previously used standard for delineating floodable areas of a 1% annual exceedence probability flood event, in order to take into account the likely effects of climate change. Policy 10-2 generally seeks to avoid residential development and other new activities in areas likely to be affected by flooding, due to the risks to human life and property. It is recognised, however, that some activities have a functional constraint to be located in floodable areas (Policy 10-32), or that measures, taking into account residual risk for dwellings and other activities, (for example, access outside of floodable area and building design) can be put in place to avoid any increase in impacts of floods (Policy 10-2).

- (b) Make other minor changes to reflect re-numbering of policies.

4.18 Glossary – Term - Critical infrastructure

Table of Submitters, Submission Points and Recommendations

Submitter	Number	Point	Decision Sought	Recommendation
AIRWAYS CORPORATION OF NEW ZEALAND	36	21	<p>Amend the definition of critical infrastructure as shown below:</p> <p>"Critical infrastructure means infrastructure necessary to provide services which, if interrupted, would have a serious effect on the people within the Region or a wider population, and which would require immediate reinstatement. Critical infrastructure includes infrastructure for-</p> <p>(a)....</p> <p>(h) Healthcare institutions including hospitals,</p> <p>(i) An airport as defined in section 2 of the Airport Authorities Act 1966, and</p> <p>(j) A navigation installation as defined in section 2 of the Civil Aviation Act 1990"</p>	Reject
	X 476	14	PALMERSTON NORTH AIRPORT LTD - Support	Reject
VECTOR GAS LIMITED	115	2	<p>(a)Amend the definition of "Critical Infrastructure" within the Glossary to read as follows:</p> <p>"Critical Infrastructure means infrastructure necessary to provide services which, if interrupted, would have a serious effect to the people within the Region or a wider population, and which would require immediate reinstatement. Critical infrastructure includes infrastructure for:</p> <p>(f) high pressure gas pipelines that transmit natural or manufactured gas including above-ground stations that support these pipelines"</p>	Reject

Submitter	Number	Point	Decision Sought	Recommendation
RUAPEHU DISTRICT COUNCIL	151	31	(a) Council seeks to have the description of infrastructure and critical infrastructure amended to include:	Reject
			- Solid Waste Services: The Solid Waste Services and Infrastructure include the collection of both refuse, and material for recycling from the community. Infrastructure is processing plant, including composting, cleanfills, transfer stations and resource recovery facilities, which are owned or administered by the Council.	
			- Stormwater Network: A network of open drains and pipes which conveys Stormwater, including Flood Protection Management by TAs.	
			- All the roading network developed and maintained by District Councils is of Regional importance. The roading infrastructure components include the side slopes, batters, associated water courses, carriageway, bridges and culverts, berm, land and fill.	
			- Water Supply Network: The collection, conduction, treatment, storage, piped networks and associated structures that provide water to the public.	
			- Wastewater Network: The reticulation, treatment, storage disposal structures, and pipe networks that service the public.	
	X 481	96	PALMERSTON NORTH CITY COUNCIL - Support	Reject
	X 492	360	MINISTER OF CONSERVATION - Oppose	Accept
TRUST POWER LIMITED	358	136	Amend the definition of 'Critical infrastructure' to include specific reference to wind farms and hydro electricity facilities.	Reject
			Any similar amendments to like effect.	
			Any consequential amendments that stem from the amendment of this definition as proposed in this submission.	
	X 487	159	FONTERRA CO-OPERATIVE GROUP LIMITED - Oppose	Accept

Submitter	Number	Point	Decision Sought	Recommendation
	X 522	448	MERIDIAN ENERGY LIMITED - Support in Part	Reject
	X 525	235	GENESIS POWER LTD - Support	Reject
	X 527	49	TARARUA - AOKAUTERE GUARDIANS INC (T A G) - Oppose	Accept
MIGHTY RIVER POWER	359	135	Include electricity generation facilities within the definition of critical infrastructure.	Reject
	X 487	158	FONTERRA CO-OPERATIVE GROUP LIMITED - Oppose	Accept
	X 511	545	TRUST POWER LIMITED - Support	Reject
	X 521	64	Allco Wind Energy N Z Ltd - Support	Reject
	X 525	97	GENESIS POWER LTD - Support	Reject
MERIDIAN ENERGY LIMITED	363	197	Meridian requests the definition is amended as follows: Essential infrastructure (a) electricity substations and associated lines and cables Any consequential amendments necessary to give effect to this submission	Reject
	X 525	80	GENESIS POWER LTD - Support	Reject

4.18.1 Summary of submission points

- (a) Include additional infrastructure in the definition of 'critical infrastructure', including:
- i. an airport as defined in section 2 of the Airport Authorities Act 1966, and a navigation installation as defined in section 2 of the Civil Aviation Act 1990
 - ii. high pressure gas pipelines and support structures
 - iii. solid waste management facilities
 - iv. water supply, sewerage, roading and stormwater networks
 - v. electricity generation facilities, including wind farms and hydro
 - vi. electricity transmission lines and substations.

4.18.2 Evaluation

The reference to 'critical infrastructure' within Chapter 10 is to identify infrastructure that should not be located within areas subject to natural hazards unless there is a functional reason for it to be located there. Therefore the intention is for Policy 10-4, as originally notified, to be restrictive and to discourage the establishment of critical infrastructure in particular areas. The policy is not intended to provide protection of the infrastructure from other land use activities.

The infrastructure listed as 'critical infrastructure' is currently very limited. The infrastructure listed is primarily infrastructure that is large and would have a major impact on a large number of people if it were to be damaged or destroyed as a result of a natural hazard event. It is also infrastructure that could not be replaced or repaired within the space of a few days, as pipe or cables can generally be. The listed critical infrastructure represents facilities that have a high value to the community and would be extremely costly if they had to be replaced. Policy 10-4 recognises the value of these few pieces of infrastructure and directs decision-makers to avoid placing it in areas where it is at greater risk of damage than would otherwise be the case.

In relation to the location and design of new infrastructure, and as discussed in the section of this report that addresses submissions on Policy 10-4, the POP provisions are guided by s60 of the CDEM Act, which requires 'lifeline utilities' to ensure that the utility is able to function to its fullest possible extent during an emergency. This suggests that lifeline utility providers need to carefully consider the location and design of utility infrastructure at the time of construction to minimise the chances of that infrastructure being impacted during an emergency. Of the infrastructure requested by submitters to be included in the definition of critical infrastructure, only solid waste management facilities are not specified as 'lifeline utilities' in Schedule 1 of the CDEM Act.

While there is some cross-over between Policy 10-4 and the CDEM Act responsibilities of lifeline utilities, I consider that this is appropriate where Policy 10-4 identifies only those pieces of infrastructure that are of particular value to the community. Providers of other infrastructure would be wise to locate it outside areas subject to natural hazards wherever possible, but it is

not considered necessary for the POP to require this separately where there is already an obligation under the CDEM Act.

It appears that some submitters have requested amendments to the definition of critical infrastructure on the understanding that it is relevant to Chapter 3 – Infrastructure Energy and Waste. However, the term ‘critical infrastructure’ is only used in Chapter 10 and is intended to identify only significant infrastructure, as discussed above. Critical infrastructure is not a term that is used in Chapter 3.

I consider that the current list of critical infrastructure represents infrastructure that, where possible, should not be established in areas subject to a natural hazard. I note that the list of infrastructure is not exclusive as the wording of the definition says ‘critical *includes* infrastructure for ...’ Where it is proposed to establish new infrastructure that would otherwise fall within the definition of critical infrastructure but which is not otherwise listed, Policy 10-4 may still be applied to the consideration of the proposal if relevant.

4.18.3 Recommendation NH 18

- (a) Reject submissions requesting amendments to the definition of ‘critical infrastructure’.

4.18.3.1 Recommended changes to provision

- (a) None.

4.19 Glossary – Term – Floodway

Table of Submitters, Submission Points and Recommendations

Submitter	Number	Point	Decision Sought	Recommendation
PIRIE CONSULTANTS LTD, PACIFIC FARMS LTD, HOULT CONTRACTORS LTD, KEEGAN CONTRACTORS LTD, PARANUI CONTRACTORS LTD, RYMAN HEALTHCARE LTD, M & M EARTHMOVERS LTD, TITAN1 LTD AND O'HAGAN CONTRACTING LTD	303	10	Amend definition so that it relates only to Maps I:2, I:3, I:3 and I:4.	Reject

4.19.1 Summary of submission points

- (a) Amend definition so that it only refers to the maps in Schedule I that show the floodways.

4.19.2 Evaluation

At present, the maps in Schedule I are a little unclear and it is difficult to identify floodways. However, if the maps in Schedule I are modified as recommended below to more accurately show the floodways, and remove existing ambiguity, it is considered that the relevant maps would be self-explanatory and do not need to be specified in the Glossary entry.

4.19.3 Recommendation NH 19

- (a) Reject the submission requesting amendments to the Glossary term 'floodway'.

4.19.3.1 Recommended changes to provision

- (a) None.

4.20 Schedule I – General

Table of Submitters, Submission Points and Recommendations

Submitter	Number	Point	Decision Sought	Recommendation
HORIZONS REGIONAL COUNCIL	182	147	Replace Map I:3 with a new map (attached to submission as appendix 6) which shows updated information on the floodable area of the Taonui Basin Spillway.	Accept in part
PALMERSTON NORTH CITY COUNCIL	241	122	That Horizons remove the confusion arising between "floodable areas" within the Policy and "spillways" within the maps included in Schedule I.	Accept in part
	X 500	312	TARARUA DISTRICT COUNCIL - Support	Accept in part
	X 507	312	MANAWATU DISTRICT COUNCIL - Support	Accept in part
	X 515	314	HOROWHENUA DISTRICT COUNCIL - Support	Accept in part
	X 517	300	RANGITIKEI DISTRICT COUNCIL - Support	Accept in part
	X 532	312	WANGANUI DISTRICT COUNCIL - Support	Accept in part
MANAWATU DISTRICT COUNCIL	340	129	Change Schedule I to show the Drainage Schemes administered by the Manawatu District Council, and any other TAs.	Reject
	X 481	685	PALMERSTON NORTH CITY COUNCIL - Support	Reject
MANAWATU DISTRICT COUNCIL	340	79	The Floodable Area Maps in Schedule I need to be of a larger scale and more definitive if the Territorial Authorities are to apply specific provisions to these areas.	Reject
	X 481	635	PALMERSTON NORTH CITY COUNCIL - Support	Reject
ENVIRONMENT NETWORK MANAWATU	356	37	ENM seek clarification of floodways and floodable areas	Accept in part

4.20.1 Summary of submission points

- (a) Replace Map I:3 with map showing updated floodable areas.
- (b) Resolve the confusion associated with the terms 'floodway', 'spillway' and 'floodable area'.
- (c) Show drainage schemes administered by Territorial Authorities in the maps in Schedule I.
- (d) Increase the scale of floodable areas maps.

4.20.2 Evaluation

- (a) Horizons have made a submission on the POP to include more up-to-date mapping data on the Taonui Basin floodway. This is considered appropriate to ensure that the maps represent the current information on floodways. The map actually identifies the Taonui Basin *floodway* and it is therefore recommended to amend the map to be annotated as for the other floodway maps discussed below.
- (b) The current set of maps showing the floodways in the Region creates some confusion due to the labelling of features on the maps. It is considered that the purpose of the maps is to enable Plan users to identify the extent of 'floodways'. Some of the maps refer to the floodways as 'floodable areas', and include annotations of spillways. Spillways are where flood waters enter or exit floodways. It is therefore recommended to remove the 'floodable area' annotation from the maps and insert 'floodway' annotations. Spillways will still be identified on the maps to provide reference points for users, but will be printed in a smaller font size to indicate that they are for information only.
- (c) Drainage schemes that are administered by Territorial Authorities have not been included in the maps in Schedule I, primarily because there is no policy direction in Chapter 10 of the POP that refers to them directly. While they may fall within floodable areas, they are not managed or administered by the Regional Council and therefore are not afforded the same protection as floodways. Territorial Authorities are able to manage land use activities in and near drainage schemes that they administer via their own District Plans or local bylaws.
- (d) The scale of Figures I2, I4 and I5 currently provides sufficient detail to determine the general location and extent of floodways, with property boundaries relatively easily identifiable. I consider that these three maps could be used by a property owner to determine whether a floodway affects their property. However Figure I3 (Taonui Basin) is at a scale where property boundaries are difficult to identify. To assist with the clarity of the POP, I recommend that the scale of Figure I3 be amended to a similar scale to that of the other figures. This requires the map to be separated over several pages.

The precise location and extent of these floodways is better mapped at a smaller scale in District Planning maps (as is required by Policy 10-1(c)(ii)). To assist in this process, all Territorial Authorities will be provided with electronic data defining the floodways for inclusion in their GIS systems. Mr Blackwood provides a summary of the information

transfer process in his evidence. Therefore I do not consider it necessary to increase the scale of the maps, other than the map of the Taonui Basin.

4.20.3 Recommendation NH 20

- (a) Accept in part submissions that request to:
 - i. Replace Map I:3
 - ii. Resolve the confusion with the current maps

- (b) Reject submissions that request to:
 - i. Show drainage schemes administered by Territorial Authorities
 - ii. Increase the scale of the maps

4.20.3.1 Recommended changes to provision

- (a) Replace Map I:3 with the map included as Appendix 6 in Horizons Regional Council's submission, subject to changes to all maps for clarification reasons.

- (b) Amend maps showing floodways (see Appendix 1 for recommended maps).

4.21 Schedule I – Figure I:3 Taonui Basin Spillway

Table of Submitters, Submission Points and Recommendations

Submitter	Number	Point	Decision Sought	Recommendation
PALMERSTON NORTH CITY COUNCIL	241	116	That Horizons adopt Schedule I, in particular Figure I:3 Taonui Basin Spillway.	Accept in part
	X 500	306	TARARUA DISTRICT COUNCIL – Support	Accept in part
	X 507	306	MANAWATU DISTRICT COUNCIL – Support	Accept in part
	X 515	308	HOROWHENUA DISTRICT COUNCIL – Support	Accept in part
	X 517	294	RANGITIKEI DISTRICT COUNCIL – Support	Accept in part
	X 532	306	WANGANUI DISTRICT COUNCIL – Support	Accept in part

4.21.1 Summary of submission points

- (a) Adopt Map I:3 showing the Taonui Basin Spillway.

4.21.2 Evaluation

- (a) As discussed in section 4.20 of this report, it is recommended to replace the notified Figure I:3 with the revised Figure I:3, as submitted by Horizons Regional Council. The revised map more accurately defines the Taonui Basin Floodway.

4.21.3 Recommendation NH 21

- (a) Accept in part the submission requesting that Map I:3 be adopted.

4.21.3.1 Recommended changes to provision

- (a) Replace Figure I:3 with the revised Figure I:3, as submitted by Horizons Regional Council, with such modifications as recommended in Recommendation NH 20 (including to increase the scale to aid readability).