

# Waikanae FMP Addendum 2012

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# 1. Executive Summary

The Waikanae FMP was completed in October 1997 following a five-year process of investigation, development and consultation. It was produced to provide an agreed blueprint for the management of the river and floodplain for 40 years. Feedback from the community, KCDC, GW staff and other users of the FMP is that it has largely worked well over the past 15 years. Implementation of the various structural, non-structural, river management and environmental measures is proceeding well. Nevertheless, regular review is an important part of the FMP process to ensure that progress is monitored and that critical elements are kept up to date.

The first review of the 1997 Waikanae Floodplain Management Plan (FMP) was completed in 2012. The outputs of the review are three documents which should be read in conjunction with each other:

1. The reprinted 1997 FMP, with highlighting where there have been changes (WGN DOCS #1140370)
2. The 2012 FMP Addendum, showing detail of the changes to the FMP (WGN DOCS #1063051)
3. The 2012 FMP Actions List (WGN DOCS #1066769).

The key issues, methods and outcomes of the FMP remain substantially unchanged. The reprinted FMP is highlighted in areas where the text, tables or figures have been updated in the review. Please refer to the Addendum for updated information in these areas. The Actions List lists outstanding tasks and will be updated at least annually. These tasks are either incomplete items from the FMP or new items that have arisen subsequently.

The review was a technical appraisal rather than a complete revision of the FMP, and covered the scope as listed in Table 7 of the FMP. Generally speaking, the review has assessed progress in meeting the original outcomes, and has updated the methods/guidelines/outcomes where necessary to bring the FMP up to date with current information, practices and expectations.

Some key changes/outcomes of the review are:

- Climate change is being taken into account explicitly in all river modelling and design
- Changes have been made to reflect the latest flood hazard zones and descriptions in the KCDC District Plan
- An Environmental Riverhand is being funded to carry out maintenance and help with implementing the environmental enhancements of the Environmental Strategy
- Management of gravel is an ongoing problem, and different options are being considered under a Sediment Transport Study

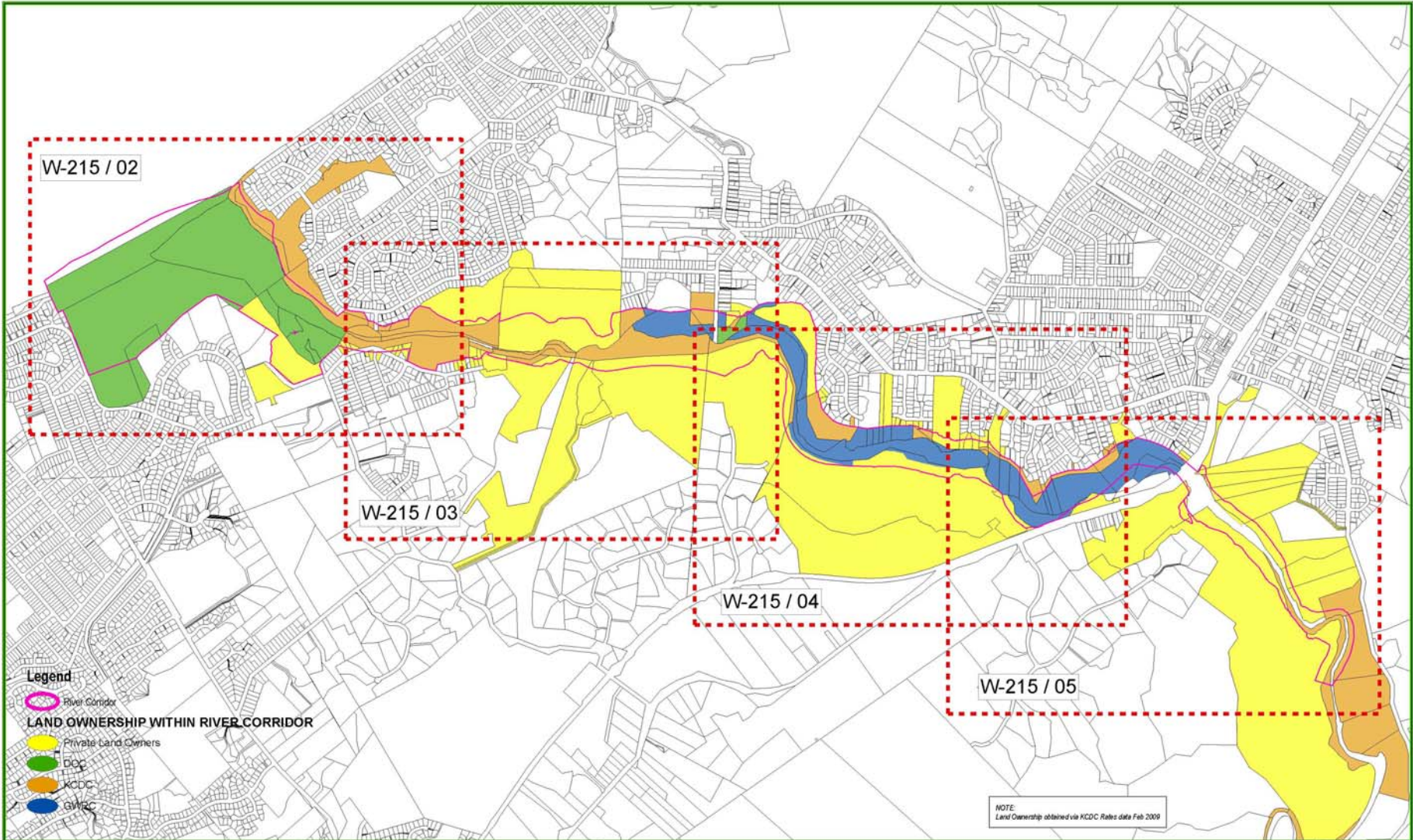
- Some appendices have been updated to reflect changes in Civil Defence Emergency Management.

The review was mainly carried out during 2010 and 2011, and is described in detail in the report “Waikanae Floodplain Management Plan – 10 year review: summary report for consultation” (WGN DOCS #722672). The summary report formed the basis for extensive consultation during late 2010 and early 2011. A Consultation Report (WGN DOCS # 961811) summarises the consultation results. Both of these reports provide detailed background information on the changes made in the Addendum and the further work items in the Actions List. Refer to these reports for more detail on the review itself and the reasons for the changes.

It is likely that the next review will include a complete revision and republishing of the FMP. This is anticipated to take place in 2022.

Plan Heading	Section	Page No.	Changes to WFMP
Non-Structural methods	3.1	Pg 23	
Land Management Planning	3.1.1	Pg 24	
Background to hazard categories	3.1.1.1	Pg 24	<p>Update 1<sup>st</sup> para:</p> <p>Nine Flood Hazard Categories have been identified on the Waikanae floodplain and are incorporated into the KCDC District Plan. These categories are:</p> <ul style="list-style-type: none"> <li>• <b>River Corridor.</b> The minimum area able to contain a flood of up to the 1 in 100-yr event magnitude and enable flood water to pass safely to the sea. It includes flood and erosion prone land immediately adjacent to the river, where the risk to people and development is significant.</li> <li>• <b>Stream Corridor.</b> The minimum area able to contain a flood of up to a 1 in 100-yr event magnitude and enable flood water to safely pass to the stream confluence or the sea. It includes flood and erosion prone land immediately adjacent to the stream.</li> <li>• <b>Overflow Path/Residual Overflow Path.</b> Overflow Paths generally occur in lower-lying areas on the floodplain which act as channels for flood waters. They can be natural, or artificially formed, and are often characterised by fast flowing water during a flood event. An Overflow Path may be a direct flood risk, or a residual flood risk where they are protected from flooding by structural measures, such as stopbanks or floodwalls, constructed to the 1 in 100-yr flood standard.</li> <li>• <b>Ponding Area/Residual Ponding Area.</b> These are floodplain areas where slower-moving flood waters could pond either during or after a flood event. A Ponding Area may be affected by a direct flood risk, or by residual flood risk where they are protected from flooding by structural measures, such as stopbanks or floodwalls, constructed to the 1 in 100-yr flood standard.</li> <li>• <b>Flood Storage Area.</b> Land that provides flood water storage either during or after a flood event. Flood Storage Areas are located on local streams only. They include land that has been identified as flood prone where loss of storage due to mitigating measures, or filling, will cause flooding elsewhere. Any proposal for development of these areas (including filling) will need to provide compensatory storage below set ponding levels.</li> <li>• <b>Flood Erosion Area.</b> Land adjacent to the River Corridor Zone that could potentially be eroded in flood events.</li> <li>• <b>Fill Control Area.</b> Fill Control areas are undrained “crater” type catchments where filling will raise the level of flooding on the property and on adjoining land.</li> </ul> <p>Refer to the KCDC District Plan for the latest hazard categories, maps and descriptions.</p>

Plan Heading	Section	Page No.	Changes to WFMP
	Figure 7	Pg 25	Hazard categories have changed. Refer to 3.1.1.1 above, KCDC District Plan and latest flood hazard mapping available from KCDC
	Table 2	Pg 26	Hazard categories have changed. Refer to 3.1.1.1 above and KCDC District Plan
Description of hazard categories for the Waikanae Floodplain	3.1.1.2	Pg 27	Update:  Flood hazard categories were revised in 2002 and included in the District Plan. Refer KCDC District Plan and 3.1.1.1 above.
d) Fringe area		Pg 28	Descriptions of Fringe areas have been replaced by Residual Overflow Path, Residual Ponding and Erosion Hazard categories in the KCDC District Plan. See 3.1.1.1 above.
District Plan Implications	3.1.1.3	Pg 28	
<ul style="list-style-type: none"> <li>Encourage KCDC to Protect upper and middle catchment</li> </ul>		Pg 29	Update:  Encourage KCDC to protect upper and middle catchment remnant bush, and that GW and KCDC coordinate restoration work with landowners
Extent of Flooding in extreme event	Fig 8	Pg 30	This map has not been updated from the 1997 publication of the FMP. GW intends to give updated extreme flood mapping to KCDC once the 2012/13 hydraulic modelling is complete. Residual flood hazard mapping is already available. Contact KCDC for the most up-to-date information.
River Corridor Land Ownership	Fig 9	Pg 32	Updated. Refer figure W-215/01



AMENDMENT	DWN	CHK	DATE	CATCHMENT MANAGEMENT FLOOD PROTECTION		
				DESIGN	COMPILED	7-2005
				DRAWN	P. COOK	7-2005
				CHECKED		
				RECOMND		
				APPROVED		

**WAIKANAE RIVER**  
**LAND OWNERSHIP WITHIN THE RIVER CORRIDOR**  
**OVERALL LAYOUT**  
**FEB 2009**

 <b>greater WELLINGTON</b> REGIONAL COUNCIL	FILE No.
	A3 SCALE
DRAWING No. <b>W-215 / 1</b>	SHEET No. 1 OF 5 SHEETS



Drawing Reference:  
File Ref: W-215-all.mxd

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Plan Heading	Section	Page No.	Changes to WFMP
<b>River Corridor Management</b>	3.1.1.5	Pg 31	
Facilitate utility services groups		Pg 31	Update:  The Council will facilitate utility services groups as required to co-ordinate and rationalise utility services within the River Corridor. The proposed Mackays to Peka Peka expressway may provide an opportunity to rationalise services.  In the absence of any general need to form a utility service group, GW will continue to identify opportunities for improvement as capital works proceed and utility services proposals are received.
<b>Community Preparedness</b>	3.1.2	Pg 33	
The Council role in flood awareness	3.1.1.2	Pg 33	
(i) Provide up-to-date information		Pg 33	Note:  Throughout the FMP, "Civil Defence" should now read "Civil Defence Emergency Management" or CDEM
Flood Preparedness	3.1.2.2	Pg 34	
(i) Insurance against flood loss and damage		Pg 34	Update:  As part of its role in flood awareness, the Council will encourage insurance for at-risk properties. Individuals are responsible for seeking and obtaining insurance, and advising insurance companies of the flood risk to their property.
(ii) Flood Warning		Pg 34	
The Council will maintain and improve the flood warning system by:  <ul style="list-style-type: none"> <li>Implementing a real-time flood forecasting model</li> </ul>		Pg 34	Update:  GW will continue to monitor developments in real-time flood forecasting technology and consider whether this could be applied to the Waikanae River.
Installing a back-up rain gauge system		Pg 34	Update:  Rainfall alarms are based on a network of three rainfall gauges. This is considered to give sufficient redundancy for alarm and flood prediction purposes.



Plan Heading	Section	Page No.	Changes to WFMP
			The river level gauge at the WTP has been rebuilt with two river level recorders, each with a separate communications system.
<b>Structural Methods</b>	3.2	Pg 34	
Road Raising	3.2.1	Pg 34	Update:  Greenaway Road was raised in 1997. Otaihanga Road south was raised in 2000. Makora Road west did not proceed at the request of residents. Makora Road (adjacent to the Otaihanga Domain) was replaced with a flood wall following consultation with KCDC and residents. There are no plans to carry out any further road raising at this time and no funds are allocated in the LTP.
Stopbanks	3.2.2	Pg 34	Update 3 <sup>rd</sup> para:  The western section of Woodleigh Stud/Howarth stopbank lies on land purchased by GW in 2008 and is to be maintained by GW.  All stopbank designs will be done in accordance with the latest GW policy on climate change or national guidelines where these are more appropriate.
Locations of Structural Methods	Figure 10	Pg 35	Table 3 and Figure 10 updated below.
Structural Methods Proposed	Table 3	Pg 36	See updated Table 3 below – separated into Table 3a (for outstanding works) and Table 3b (for completed works)

Table 3a: Outstanding structural methods proposed as part of the Waikanae Floodplain Management Plan (1997) in priority order (Updated 2012)

<b>Area</b>	<b>Location</b>	<b>Construction Cost 1997 (\$) Estimated</b>	<b>Status (July 2012)</b>
Jim Cooke Park	Re-construct existing stopbank	143,000	Programmed 2013-16
Jim Cooke Park	Retaining wall at the upstream end of stopbank	175,000	Programmed 2013-16
Waikanae Beach	Lengthen Fieldway Bridge	429,000	Under review, pending 2012-13 hydraulic modelling. Not in 10 current year plan
Waikanae Beach	Golf Course Stopbank	715,000	Under review, pending 2012-13 hydraulic modelling. Not in 10 current year plan
Jim Cooke Park	Ring bank Lion Park	33,000	Not in current 10 year plan
<b>Total</b>		<b>\$1,495,000</b>	

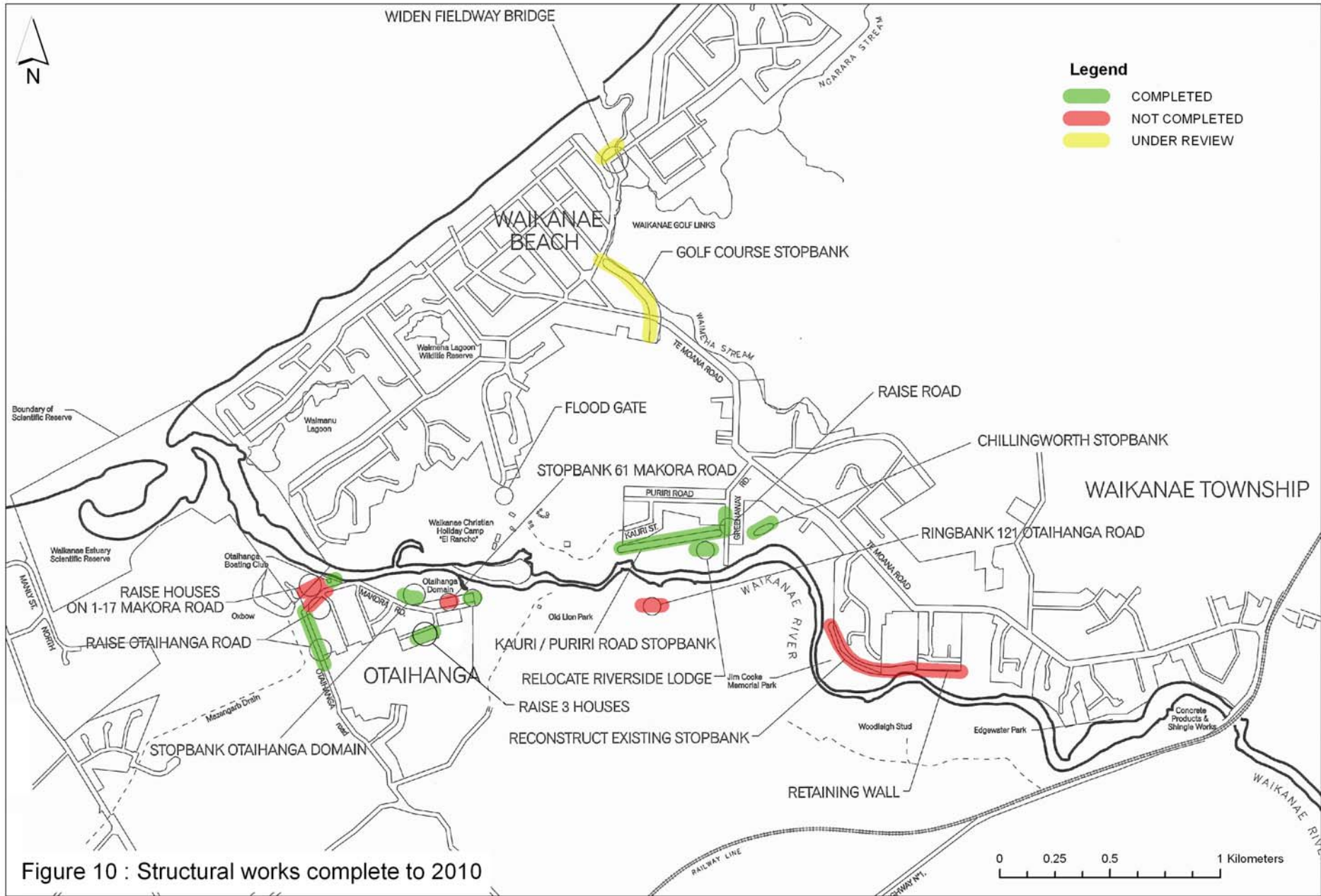
Note: (1) The costs do not include the cost of land purchase

Table 3b: Completed structural methods proposed as part of the Waikanae Floodplain Management Plan (1997) (Updated 2012)

Area	Location	Construction Cost 1997 (\$) Estimated	Status (July 2012)	Construction Cost 1997 (\$) (actual)
Otaihanga	Raise houses 1 – 17 Makora Road	400,000	House raising programme completed in 2011/12 with no further funding allocated at this time. Not all property owners chose to raise their houses.	56,000
Otaihanga	Raise Otaihanga Road	140,000	Completed 2000, except Makora Road west section between Nos. 2-22 which was cancelled by adjoining residents.	98,000
Otaihanga	Raise 73 Makora Road and 11 and 13 Toroa Road	125,000	Completed 2000	158,000*
Otaihanga	Otaihanga Domain Stopbank	184,000	Completed 2003. A floodwall was constructed instead of a stopbank.	136,000
Kauri Puriri Road	Stopbank	894,000	Completed 1997	538,000
Greenaway Road	Relocate Riverside Lodge	124,000	Completed 1997	0
Greenaway Road	Raise Road	36,000	Completed 1997	36,000
Chillingworth	Stopbank	228,000	Completed 1997	228,000
<b>Total</b>		<b>\$2,131,000</b>		<b>\$1,250,000</b>

Note: (1) \* Includes additional house raising at 15 Toroa Road and 21 Makora Road  
(2) The costs do not include the cost of land purchase

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Bridge lengthening	3.2.3	Pg 36	<p>Update:</p> <p>Lengthening of the Fieldway Bridge will be investigated as part of hydraulic modelling work being carried out in 2012/13. This work will confirm whether there is a need for the bridge to be lengthened and how this work would relate to the proposed golf course stopbank. No funding agreement with KCDC has been made yet.</p>
House raising	3.2.4	Pg 36	<p>Update:</p> <p>The following seven properties have been raised or flood-proofed with GW assistance: 11, 13 and 15 Toroa Rd; 17, 19 (boat club), 21 and 73 Makora Rd. No further applications for funding assistance were received by GW before the 30<sup>th</sup> June 2011 deadline and no further funding is available at this time.</p>
Priority	3.2.5	Pg 37	<p>Update:</p> <p>The outstanding structural measures are listed in priority order in Table 3a above. The Fieldway Bridge and Golf Course Stopbank have been moved to a lower priority due to uncertainties in:</p> <ul style="list-style-type: none"> <li>• Funding arrangements</li> <li>• Potential timing of the bridge lengthening – would typically be carried out at the time of bridge replacement and this is not currently programmed</li> <li>• The modelled flood risk, as there is a concern that the existing modelling overestimates the flood risk at this location</li> </ul> <p>The hydraulic modelling to be carried out in 2012/13 will confirm whether there is a need for the bridge lengthening and/or Golf Course Stopbank. The list will then be reprioritised with this new information.</p>



Plan Heading	Section	Page No.	Changes to WFMP
<b>River Management</b>	<b>3.3</b>	Pg 38	
Channel Alignment	3.3.1	Pg 38	Update:  Bibliography 3.2 reference should read Bibliography 3.1
River Training Methods	3.3.1	Pg 38	Note: With the completion of programmed major works the balance of types of methods has changed to reflect the increase in permanent works in the river and river corridor maintenance work required.
River Channel Maintenance	3.3.2	Pg 38	
Preferred Channel Alignment	3.3.2.2	Pg 38	Update:  Bibliography 3.2 reference should read Bibliography 3.1
Planting of native trees and shrubs	3.3.2.3	Pg 38	Note: the native planting is currently being carried out largely by the Friends of the Waikanae River (FWR). Approximately 10% of the willow planting budget is used for preparing sites for planting and maintenance (mostly weed control) of plantings by the FWR.  Due to the increase in permanent works in the river and less maintenance being required, it has been possible in some years to provide additional funding from the maintenance budget to assist with environmental enhancement works.  The 2013-2023 LTP has made allowance for funding a Kapiti Environmental Riverhand. It is envisaged that the Riverhand will spend approximately 1-2 days per week working on the Waikanae River.
Berm maintenance	3.3.2.3	Pg 39	Add:  All structures will be maintained to the agreed level of service. In the case of stopbanks constructed under this FMP, the agreed level of service is a 100-year flood. Improving existing structures to meet the agreed level of service will be a high priority and will be prioritised ahead of building new structures.
Programmed Major Works	3.3.2.4		Mouth: Options for works at the mouth to stabilise the south bank are being considered. This relates to future decisions to be made on sediment management and possible extraction.  Otaihanga: 180 m of rock lining was constructed on the south bank in 2010 to address bank erosion. No further work is programmed at this time.  El Rancho: The river channel was realigned onto the design channel alignment and a series of rock groynes and rock edge lines were constructed in 1997.  Greenaway Road/Jim Cooke Park: The river channel was realigned onto the design channel alignment and a series of rock groynes and a 250 m rock edge line were completed in 2007. The length of river channel downstream of Jim Cooke Park to Kauri St is proposed in the FMP for channel works but this is not currently programmed.  River Glade/Kebbels/Edgewater Park/SH1: Major river management works (rock weirs, rock edge protection and

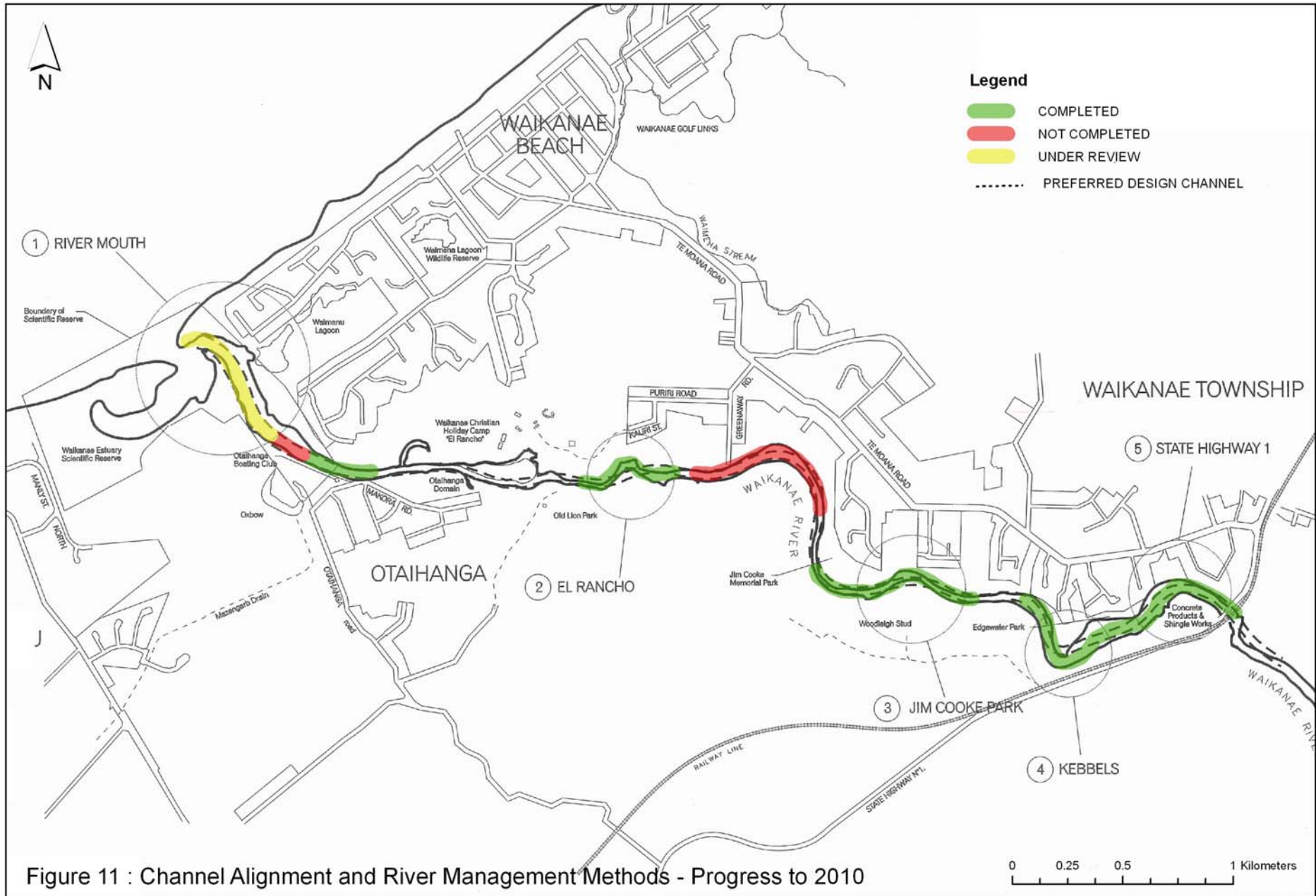
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			a rock grade control weir) were carried out in this reach and completed in 2000 in response to damage during the 1998 floods.
	3.3.3	Pg 39	
Allow for a 5mm/year rise in mean sea level in all design work affected by the tides.		Pg 39	Update. Carry out all design in accordance with the latest GW policy on climate change or national guidelines where these are more appropriate.
Gravel Extraction	3.3.4	Pg 39	
Allow the extraction of an average of 3,000 m <sup>3</sup> of gravel from the river annually, in locations that provide the maximum benefits to the river channel management, through consents applied for by the Council with private individuals undertaking the extraction.		Pg 39	Update: Gravel extraction volume and location to be as determined in the latest gravel analysis to maximise flood risk/river channel benefits, and in accordance with the relevant resource consent(s)
Table 4. Major Works		Pg 40	Table 4 updated

Table 4: Major Works (updated to 2009)

No. on Fig 11	Reach (metres upstream)	Named (major works)	Estimated Cost 1997 (\$)	Status (June 2012)	Construction Cost 1997 (\$) (actual)
1	0000-0500	Mouth	363,000	0% complete. Not in 10 year plan	-
	0500-2000	Otaihanga	414,000	38% complete in 2010.	77,000
2	2000-2600	El Rancho	570,000	100% completed in 1997	570,000
	2600-3900	Greenway Road	311,000	36% complete in 2007. Included in Jim Cooke Park section. Balance not in 10 year plan	-
3	3900-4300	Jim Cooke Park	570,000	80% complete in 2007. Included part of Greenaway Road section (see above). Balance not in 10 year plan	724,000
	4300-4900	River Glade	104,000	73% complete 2000. Balance not in 10 year plan	104,000
4	4900-5100	Kebbels	207,000	100% completed in 2000	191,000
	5100-5700	Edgewater Park	104,000	100% completed in 2000	96,000
5	5700-6100	State highway 1	207,000	100% completed in 2000	368,000
<b>Total</b>			<b>2,850,000</b>	60% completed overall (length) 75% completed overall (cost)	<b>2,130,000</b>



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Monitor River Processes	3.3.5	Pg 40	
Each year, take vertical aerial photographs of the Waikanae River using a standard 35mm camera.		Pg 40	Update: At least every 3 years, after a 20 year flood or greater, or as otherwise necessary, produce high level aerial digital colour photographs of the Waikanae River.
Take high-level aerial photographs (rectified image or othophotography) at five yearly intervals and after a 20 year flood or greater.		Pg 40	Update: At least every 3 years, after a 20 year flood or greater, or as otherwise necessary, produce high level aerial digital colour photographs of the Waikanae River.
Channel Alignment and River Management methods	Fig 11	Pg 41	Figure 11 updated



Plan Heading	Section	Page No.	Changes to WFMP
Review current knowledge on climate change every five years and revise figures used for flood mitigation methods if appropriate.		Pg 42	Update:  Implement the latest GW policy on climate change impacts on rainfall intensity and sea level rise
<b>Prepare and Implement an Environmental Strategy</b>	3.4	Pg 42	Rename section:  <b>Environmental Outcomes</b>  Update:  The FMP process highlighted the need to protect and enhance the physical environment of the Waikanae River (see Sections 4.5-4.6). This section identifies four general environmental principles that the Council will follow when implementing the primary outcomes described in sections 3.1 – 3.3. Specific guidelines are given in sections 4.5-4.6.
Environmental Principles	3.4.1	Pg 42	New section:  <ul style="list-style-type: none"> <li>▪ Minimise any adverse effects of flood mitigation works on the community including landscape, heritage, ecological, or recreational values.</li> <li>▪ Identify opportunities to enhance landscape, recreational and ecological values as part of river management and flood mitigation works, or other development within the River Corridor.</li> <li>▪ When designing works within the river environment ensure a diverse range of habitats remain, providing for native fish, plants, birds and invertebrates, and trout.</li> <li>▪ Retain and enhance public access to and along the river, where possible.</li> </ul>
Process for Implementing Environmental Principles	3.4.2	Pg 42	New section:  These principles will be implemented through the Environmental Strategy and the Environmental Code of Practice. Both documents are subject to ongoing development and review as needed, separately from the FMP review process.  The latest review of the Environmental Strategy incorporates the Ecological

Plan Heading	Section	Page No.	Changes to WFMP
			<p>Strategy. The Council will continue to implement the environmental strategy in terms of enhancing the landscape/amenity and environmental values of the river corridor and using a best practice approach to restoration work.</p> <p>The Strategy provides a structure and framework for enhancing the environmental values of the River Corridor, from Reikorangi to the river mouth, by identifying opportunities for improvements to the river environment. It will guide Council's structural and river maintenance works, non-structural methods, and the management activities of other parties involved in the River Corridor. It will identify areas where particular management or action is needed, and provide an overall framework for individual actions. It is intended for use by agencies and individuals involved in environmental management. They can use it to link their core functions and management plans into a joint management approach for the Waikanae River Corridor and its environs.</p> <p>Appropriate management of the river directed by the Strategy, should result in enhanced environmental values.</p> <p>The Code of Practice will set out the Council's environmental standards for all river maintenance and structural works. Because good work practices are generally the same for all rivers, the Code of Practice will be applied as a minimum standard regionally. River-specific guidelines for the Waikanae River are listed in sections 4.5-4.6.</p>
<b>Physical Environment</b>	<b>4.2</b>	Pg 45	
River Processes	4.2.1	Pg 45	
Issues	4.2.1.2	Pg 46	
<ul style="list-style-type: none"> <li>Flood mitigation methods have the potential to adversely affect the physical environment</li> </ul>		Pg 46	<p>Update issue as follows:</p> <p>Flood protection methods have the potential to adversely affect the environment both through both direct and indirect means within the Waikanae catchment</p> <p>Update issue explanation:</p> <p>If we are to be successful in managing a natural system, such as a river, it is important to understand how it works when it is not managed. Any flood protection methods are more likely to be successful long term when they work in sympathy with the natural processes of the river, rather than</p>

Plan Heading	Section	Page No.	Changes to WFMP
			working against them
<ul style="list-style-type: none"> <li>There is limited understanding of the complex natural processes occurring in the Waikanae River</li> </ul>		Pg 46	Update explanation:  Rivers respond unpredictably to natural events and human intervention. Developing a greater understanding of the river's long-term natural processes will assist in managing the river more effectively. Understanding these processes is a necessary and ongoing practice
Objectives	4.2.1.3	Pg 46	
		Pg 46	Additional objective:  To more fully integrate natural processes into flood mitigation measures including in stream and riparian edge works; taking into account river habitat, ecosystem and restoration needs for the river corridor, riparian margins and wetland areas in the wider catchment
Policies	4.2.1.4	Pg 46	
<ul style="list-style-type: none"> <li>To encourage conservation forestry in erosion-prone areas in the Waikanae Catchment through the Kapiti Coast District Plan</li> </ul>		Pg 47	Update Policy:  That GW and Kapiti Coast District Council work together to encourage restoration in erosion-prone areas in the Waikanae Catchment, through developing strategies, work programmes and mechanisms in the Kapiti Coast District Plan
		Pg 47	New policy:  Wherever possible, interplant willows with native species and restore riparian margins, and remove exotic species not needed for flood protection purposes
Methods	4.2.1.5	Pg 47	
Methods to achieve these policies are detailed in Section 3.3		Pg 47	Update:  Methods to achieve these policies are detailed in Section 3.3, 3.4 and 4.6.6
<b>Gravel Management</b>	4.2.2	Pg 47	

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Introduction	4.2.2.1	Pg 47	Update:  Latest analysis (2010 Gravel Analysis Report) suggests annual supply of bed material to the downstream reaches is approximately 6,000 m <sup>3</sup> /year
Objectives	4.2.2.3	Pg 48	
<ul style="list-style-type: none"> <li>To maintain bed levels at or about their current levels</li> </ul>		Pg 48	Update:  To maintain bed levels at or about 1991 levels.
<b>River Mouth and Coastal Environment</b>	4.2.3	Pg 48	
Issues	4.2.3.2	Pg 48	
<ul style="list-style-type: none"> <li>The Waikanae River mouth is a particularly dynamic and sensitive area.</li> </ul>		Pg 48	Update explanation:  No change to 1 <sup>st</sup> para.  2nd Para: Consideration of any options for stabilising the mouth must take the natural river and coastal processes into account. These processes are extremely complex, and the ways of assessing them are through modelling or research studies. This in turn means that management strategies selected now must be able to be modified when further information on river mouth processes comes to hand. Information suitable for modelling must continue to be collected
<b>Human Environment</b>	<b>4.3</b>	Pg 49	
The Community	4.3.1	Pg 49	
Issues	4.3.1.2	Pg 50	
<ul style="list-style-type: none"> <li>The risk of damage and social disruption to the Waikanae community from a flood event is high. The hazard created by this flood risk is increasing as development increases.</li> </ul>		Pg 50	Update:  The risk of damage and social disruption to the Waikanae community from a flood event is high. The consequences from flood risk are increasing as development intensity increases.
<ul style="list-style-type: none"> <li>Communities and people within Waikanae and Otaihanga are inadequately prepared for a flood event that could occur with</li> </ul>		Pg 50	Update:  Communities and people within Waikanae and Otaihanga need to remain

<b>Plan Heading</b>	<b>Section</b>	<b>Page No.</b>	<b>Changes to WFMP</b>
little or no warning.			adequately prepared for a flood event that could occur with little or no warning  Communities also need to be aware of what actions to take when given warning of a flood event
<ul style="list-style-type: none"> <li>There is uncertainty as to the responsibilities of KCDC and the Council with regard to flood preparedness and response.</li> </ul>			Note: these responsibilities are now more clearly defined with the implementation of the FMP and the 2002 CDEM Act. See appendices.
<b>Objectives</b>	4.3.1.3	Pg 52	
<ul style="list-style-type: none"> <li>To ensure that the community is aware of the responsibilities of KCDC and the Council with regard to flood preparedness and recovery.</li> </ul>		Pg 52	Update objective:  To ensure that the community is aware of the responsibilities of KCDC and the Council with regard to flood preparedness and recovery, and that the community is adequately prepared for responding to flood events.
<b>Policies</b>	4.3.1.4	Pg 52	
<ul style="list-style-type: none"> <li>To reduce or avoid the adverse effects of flooding through careful management and timing of flood mitigation methods, minimising any resulting inconvenience to the community.</li> </ul>		Pg 52	Update:  To reduce or avoid the adverse effects of flooding through avoidance/retreat as a first priority, and careful management and timing of flood mitigation methods, minimising any resulting inconvenience to the community.
		Pg 52	Insert Policy:  To ensure planning processes for post disaster recovery are in place, including redevelopment or retreat and sustainability of communities long-term, in areas adversely affected by flooding
<b>Industrial/Commercial</b>	4.3.2	Pg 52	
Introduction	4.3.2.1	Pg 52	Note: the concrete plant is no longer active and there is currently no commercial gravel extraction from the Waikanae River.
<b>Infrastructure/Services</b>	4.3.3	Pg 53	

<b>Plan Heading</b>	<b>Section</b>	<b>Page No.</b>	<b>Changes to WFMP</b>
Introduction	4.3.3.1	Pg 53	Update first para:  Currently, the Waikanae River has one road, one rail and two footbridge crossings. NZTA are presently consulting with the community for a proposed new road bridge crossing site for a four lane expressway. A twin-pylon electricity transmission line crosses the river at the upstream end of Jim Cooke Park, Nimmo Avenue West. These pylons have been relocated out of the River Corridor in order to remove this hazard to river corridor management. Additional underground services have been installed across the river at Otaihanga.
Issues	4.3.3.2	Pg 53	
<ul style="list-style-type: none"> <li>There is the potential for flooding to cause disturbance and damage to the infrastructure and services within the floodplain</li> </ul>		Pg 53	Update explanation:  The loss of services regarded as an integral part of people's daily lives can be a major source of stress. It can also seriously threaten public health. Extensive damage to infrastructure may occur during major floods, with disruptions to roads and rail services due to flood waters and/or scour damage.
<b>Economics</b>	4.3.4	Pg 54	
Objectives	4.3.4.3	Pg 55	
<ul style="list-style-type: none"> <li>To ensure individuals have sufficient insurance cover against loss or damage by flood.</li> </ul>		Pg 55	Update:  That individuals have sufficient insurance cover against loss or damage by flooding.
Policies	4.3.4.4	Pg 55	
<ul style="list-style-type: none"> <li>To encourage individuals to take out insurance cover against loss or damage by flood</li> </ul>		Pg 55	Update:  To recommend that individuals take out insurance cover against loss or damage by flooding.
<b>Ecology</b>	<b>4.5</b>	Pg 59	
Objectives	4.5.3	Pg 59	
<ul style="list-style-type: none"> <li>To avoid, remedy or mitigate any potential adverse effects</li> </ul>		Pg 59	Update:



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upon the ecology of the river and its floodplain.			To avoid, remedy or mitigate any potential adverse effects upon the ecology of the river, its floodplain and associated environmental enhancement works
Policies	4.5.4	Pg 59	
<ul style="list-style-type: none"> <li>To enhance the riparian environment wherever possible</li> </ul>		Pg 61	Update:  To incorporate environmental enhancement opportunities wherever possible
Guidelines	4.5.6	Pg 61	
<ul style="list-style-type: none"> <li>Carry out works in the river and other watercourses, and on their banks, in winter. This avoids spawning and migratory periods of fish species, especially those that are nationally threatened.</li> </ul>		Pg 61	Update:  Avoid carrying out channel works in rivers and other watercourses during the period 31 <sup>st</sup> May to 15 <sup>th</sup> September. This avoids disturbing fish spawning and migration, especially of some species that are nationally threatened.
		Pg 63	New guideline:  Interplant willows with native plants where possible, and reduce willow buffer widths where the full width is not needed, to provide opportunities for native planting.
<b>Recreation/Landscape /Heritage</b>	<b>4.6</b>	Pg 63	
Guidelines	4.6.6	Pg 65	
<ul style="list-style-type: none"> <li>Have regard to the Draft Regional Landscape Plan.</li> </ul>		Pg 65	This guideline is no longer relevant because the Regional Landscape Plan has not proceeded.
<ul style="list-style-type: none"> <li>Use suitable species in planting schemes. They may vary with location. For example, ornamentals would be more appropriate in Jim Cooke Park, and natives in more 'natural' areas.</li> </ul>		Pg 65	Update:  Use suitable eco-sourced plants, and suitable species, in planting schemes. They may vary with location. For example, ornamentals would be more appropriate in Jim Cooke Park, and natives in more 'natural' areas.
<ul style="list-style-type: none"> <li>Minimise cumulative effects of potentially visually intrusive features such as riprap. Sections of riprap should be no longer than 400 m, and an attempt should be made to achieve a 'natural' appearance by using local river boulders of differing size and shape, varying the slopes, and by encouraging</li> </ul>		Pg 65	Update:  Remove last sentence of explanation – extensive rock riprap protection may not be required.

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revegetation. This is particularly important in the reaches between Otaihanga and the mouth which require extensive riprap protection.			
<b>Planning and Land Use</b>	<b>4.7</b>	Pg 66	
Issues	4.7.2	Pg 67	
Objectives	4.7.3	Pg 69	
<ul style="list-style-type: none"> <li>To promote wise and rational use of flood-prone land</li> </ul>		Pg 69	Update:  To promote the sustainable and rational use of flood-prone land
Policies	4.7.4	Pg 69	
<ul style="list-style-type: none"> <li>To encourage reforestation of the upper and middle catchment through district and regional plans.</li> </ul>		Pg 69	Update:  Encourage the restoration of the upper and middle catchment through District and Regional plans and strategies, and provide assistance for reforestation through Council and KCDC programmes
<ul style="list-style-type: none"> <li>To prevent the inappropriate development of the River Corridor and overflow path.</li> </ul>		Pg 69	Update:  That subdivision and inappropriate new development is avoided in the River Corridor and overflow paths
<b>Land Use/Planning</b>	<b>5.6</b>		
<ul style="list-style-type: none"> <li>Future development, where possible, avoids natural hazards.</li> </ul>		Pg 71	Update:  Subdivision and inappropriate development is avoided in the river corridor and overflow paths
<ul style="list-style-type: none"> <li>The value of the wise use of flood-prone land is recognised and promoted throughout the community.</li> </ul>		Pg 71	Update:  The value of the sustainable use of flood-prone land is recognised and promoted throughout the community
<b>Elements to be Monitored</b>	<b>7.2</b>	Pg 77	Update explanation:  The items listed below will be monitored using the methods indicated and

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			reported on in the Implementation annual report
Community awareness		Pg 77	Update:  Community awareness. A repeatable methodology will be developed, and a monitoring timeframe set, for monitoring community awareness of flood risk.
Readiness of disaster agencies to respond		Pg 77	Update:  Flooding disaster response. The flood management outcomes of any Civil Defence exercises or flood emergencies will be reported annually. This is separate from the more detailed flood damage report which focuses on physical aspects of flood events.
Storm surge magnitude		Pg 77	Remove. Storm surge is included in considerations of sea level rise, and handled regionally as part of climate change policy.
River bed levels		Pg 77	Update:  River bed levels. Surveys are undertaken at least five-yearly to meet current consent conditions and a gravel analysis report is prepared.
Environmental Quality		Pg 77	Remove. This is carried out by Environmental Monitoring and is independent of Flood Protection.
New development in flood-prone areas		Pg 77	Update:  New development in flood-prone areas will monitored annually in conjunction with KCDC and included in the Implementation annual report
Sea level rise		Pg 77	Remove. This is handled regionally as part of climate change policy.
Natural river and coastal processes and the effect of physical works		Pg 77	Update:  Natural river and coastal processes and the effect of physical works will be monitored in an ongoing way during day-to-day Operations work, and annually during the condition assessment as part of the Asset Management Plan.

Plan Heading	Section	Page No.	Changes to WFMP
Percentage of implementation complete		Pg 77	Update: Percentage of implementation complete will be monitored annually.
Estimated value of assets at risk from a 100-year flood		Pg 77	Update: Estimated value of assets at risk during a 100-year flood and an extreme flood will be assessed at least every five years.
Effectiveness of the measures		Pg 77	Update: Effectiveness of all measures will be monitored during day-to-day Operations work and discussed annually with KCDC
Work priority		Pg 77	Update: Priority and timing of works will be reassessed annually by Flood Protection in conjunction with the Annual Plan and Long-Term Plan processes.
Performance of assets		Pg 77	New item: Asset performance. Performance of assets against the nominated service level (eg. 100-year flood for stopbanks constructed under this FMP) will be assessed on an annual basis as part of the Asset Management process
Environmental Strategy		Pg 77	New item: Environmental Strategy. Achievements in implementing the Environmental Strategy will be reported annually.
Hydrology and Hydraulic modelling		Pg 77	New item: Hydrology and Hydraulic Modelling. The current status of the hydrological information and they hydraulic model will be reported annually, along with any recommendations for updates.
<b>Appendices</b>			
Appendix B: Phases of Floodplain Management Planning		Pg 97	Not updated under this review, although note that FMP guidelines are currently being updated by GW

<b>Plan Heading</b>	<b>Section</b>	<b>Page No.</b>	<b>Changes to WFMP</b>
Appendix C: Regional Civil Defence Operations		Pg 98	Updated
Appendix D: Kapiti Coast Disaster Response procedures		Pg 102	Updated
Appendix E: National Recovery Plan		Pg 106	Updated
Appendix F: Flood Warning System		Pg 107	Updated

## **Appendix C: Regional CDEM Organisation**

### **C.1 Group CDEM Plan**

The Civil Defence Emergency Management Act 2002 (CDEM Act) requires every regional council and every territorial authority (TA) to unite to establish a Civil Defence Emergency Management Group (CDEM Group). The organisational structure and administrative arrangements of the Wellington Region CDEM Group are set out in the Wellington Group CDEM Plan.

Section 48 of the CDEM Act requires every CDEM Group to prepare and approve a Civil Defence Emergency Management Group Plan (CDEM Group Plan). The CDEM Group Plan provides the context and strategic direction for civil defence emergency management in the Wellington Region. It focuses on issues that the CDEM Group considers will benefit from a collective approach. The Group recognises that there are other emergency management issues that will be more appropriately dealt with by individual agencies or local authorities.

The Group CDEM Plan includes:

- Strategic direction, including a summary of the region's main hazards/risks and strategic planning for the Four Rs (Reduction, Readiness, Response and Recovery)
- An operational framework for describing the functions and responsibilities of various agencies
- Administrative arrangements relating to Group membership, finances and other matters
- Monitoring and review provisions.

The Group CDEM Plan can be obtained from the Council website [www.gw.govt.nz](http://www.gw.govt.nz).

### **C.2 States of Emergency**

A local state of emergency (within the district of one TA) may be declared in any of the following circumstances:

- It appears that an emergency has occurred or may occur within the area and it is unlikely that a declaration will be necessary in any other district within the next 24 hours
- The situation is causing or has the potential to cause loss of life, injury, illness, distress, or endangers the safety of the public or property
- The powers of sections 85-94 of the CDEM Act 2002 are required
- Emergency services advise they cannot deal with the situation
- A co-ordinated response is required, involving CDEM input.

In this case, the Local Emergency Operations Centre (EOC) will be fully active, with the Group EOC active in support. The emergency will be managed by the Local controller.

A regional state of emergency may be declared in any of the following circumstances:

- It appears that an emergency has occurred or may occur within the whole Group area or one or more districts within the area
- The powers of sections 85-94 of the CDEM Act 2002 are needed
- Emergency services across the Group area advise they cannot deal with the situation
- A co-ordinated response is required involving CDEM input
- More than one territorial authority area has a declaration or potential emergency in place
- The resources of the CDEM Group are needed to assist another area that has declared a state of local emergency.

In this case, the Local EOCs and the Group EOC will be active and the emergency will be managed by the Group controller.

A National state of emergency may be declared for an emergency affecting more than one CDEM Group or for other emergencies of national significance. These emergencies are managed by the National controller.

### **C.3 Flood Protection's role under the Group Plan**

The Regional Council's Flood Protection department has a defined role in the Group CDEM plan in two areas:

- Readiness. Flood Protection develops flood warnings for major river systems and disseminates these to TAs, emergency responders and pre-arranged landowners. Flood Protection also interprets weather warnings and other meteorological information to identify potential for flooding
- Response. Flood Protection is a support agency to TAs in providing resources and personnel to assist with local reconnaissance.

### **C.4 Flood Protection's other roles**

Flood Protection has other roles as defined in this FMP in addition to its roles under the Group Plan:

- Reduction and Readiness - education and community awareness of flooding, reduction in flood risk through structural measures and avoidance of flood risk through non-structural measures.

- Response - Flood Protection's response procedures are described in the Flood Procedures Manual 2007 which is currently under review. The Department's activities during a flood, as described in that manual, consist of providing information and advice, handling requests for information from the public, monitoring flood levels and performance of structures, data collection and providing other assistance to the TA as resourcing permits.
- Recovery – collecting information and flood damage reporting, providing advice, repairs to structures and flood damage within the river corridor.



## Appendix D: KCDC Response Procedures

### D.1 KCDC CDEM Plan

KCDC has a statutory obligation to take all necessary steps to undertake civil defence emergency management (CDEM) as required by section 59, Civil Defence Emergency Management Act 2002. This obligation is reinforced further by section 64 in that KCDC must plan and provide CDEM within its district and ensure that it is able to function to the fullest possible extent during and after emergencies.

The KCDC CDEM Plan enables KCDC to meet these obligations by setting out the structure, functional roles, authorities and responsibilities; to enable the District Council to deliver its goal of enhancing the resilience of the District's communities.

The Plan summarises the hazard risk that requires KCDC involvement and management.

It identifies the roles and responsibilities for CDEM that KCDC's internal organisations undertake and where they apply those for the local core emergency services and agencies (including GW Flood Protection) during the Readiness, Response and Recovery phases. An organisation and structure is described for each phase.

It also identifies a senior manager as the Local Controller and alternates.

The KCDC CDEM Plan can be found on the KCDC website, [www.kapiticoast.govt.nz](http://www.kapiticoast.govt.nz)

### D.2 CDEM Emergency Operations Centre (EOC) Standard Operating Procedures (SOPs)

These refer to the business of the EOC and are published under the authority of the Local Controller. They set down how it will function including the roles and responsibilities of its components. They are designed primarily for use by KCDC staff and are also of relevance to the emergency services' and agencies' liaison officers.

The purpose of the EOC is to provide a central location with trained Council staff that enables the Controller to direct and coordinate the use of personnel, material, information, services and other resources for the overall response effort during an emergency.

The EOC also provides the foundation for the Recovery Manager to plan for the recovery phase following the termination of an emergency.

#### *The role of the EOC*

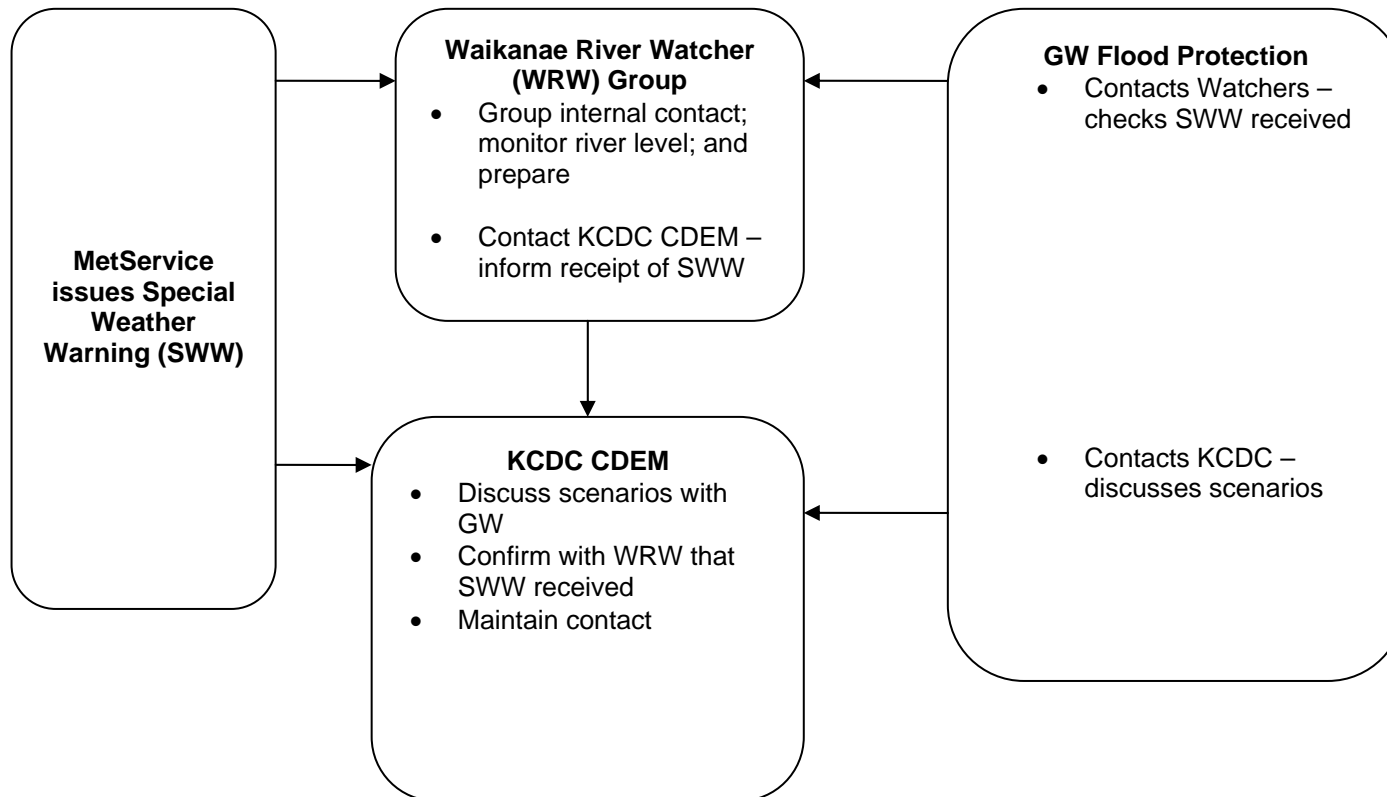
- During a non-declared emergency (Level 2 event) it **monitors and assesses** incidents which may lead to a civil defence emergency.
- During a declared emergency (Level 3 – 4) **controls and co-ordinates** the response.

### **D.3 Existing CDEM procedures in the event of a flood**

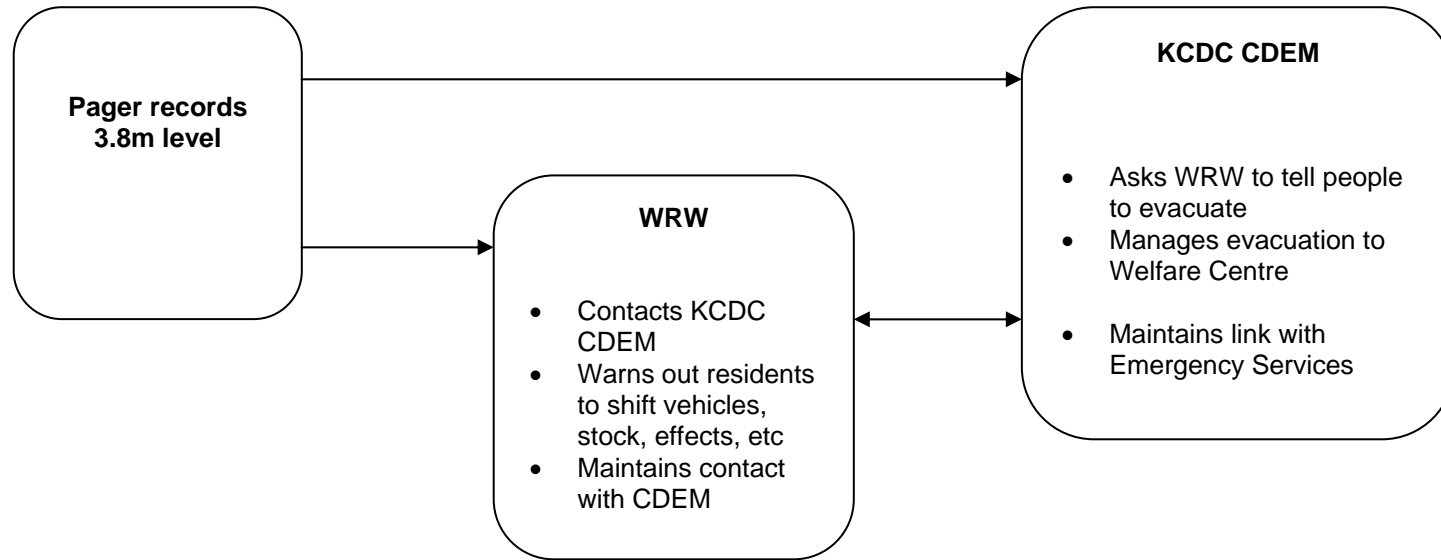
In accordance with its CDEM Plan and procedures, KCDC has enlisted assistance of the residents of the Otaihanga community on the south bank of the Waikanae River together with residents on the opposite north bank. This group is known as the Waikanae River Watchers and procedures for an impending flood event are illustrated in Figures 16 and 17.

## Waikanae River Watchers Operating Procedures

**Figure 16. Weather warning received:**



**Figure 17. High water level alarm:**



## **Appendix E: Recovery – Roles and National Assistance**

### **E.1 Local and Group CDEM Roles**

Recovery involves minimising the escalation of the consequences of an emergency, rehabilitation of the emotional, social, physical and economic wellbeing of communities, taking opportunities to meet future community needs, and reducing future exposure to hazards and risks.

The priorities to be followed in a recovery phase are:

- Safety of individuals – the safety of people remaining in the disaster area.
- Social recovery – the restoration of material and emotional needs of individuals and groups within the community.
- Economic recovery – facilitating the provision to the community of the tools needed to commence their own economic recovery.
- Physical recovery – restoring the built environment, consistent with appropriate risk management practices and principles.

Recovery activities should start when emergency response is still in progress. Key decisions during the response phase are likely to directly influence and shape recovery. Recovery management personnel and procedures should be put in place as soon as possible during response to an emergency.

Recovery should not just aim at recreating the past, but creating the future. Opportunities to reduce vulnerability to future hazard events should be sought and implemented during recovery.

The principles and responsibilities for recovery are defined in the KCDC and Group CDEM plans.

The CDEM Group has a statutory function to carry out recovery activities. However, neither the CDEM group nor the TA's recovery manager has any statutory powers during the recovery phase of an emergency.

The role of the CDEM Group in recovery is one of leadership and co-ordination of local recovery activities. The CDEM Group will:

- Appoint a Group Recovery Manager.
- Establish a multi-agency recovery management team with particular focus on key recovery issues.
- Provide advice and support to local recovery personnel.
- Report to central government departments.

Territorial Authorities will:

- Appoint local recovery managers.
- Establish a local recovery management team to facilitate recovery.
- Work with the Group Recovery Management Team.
- Plan for managed withdrawal of recovery input so that individuals and organisations within the community can, in the long term, manage their own recovery processes, albeit with support available if required.

## **E.2 Role of Central Government in Disaster Recovery**

The National CDEM Plan defines the aims of recovery:

*The aim of immediate recovery activity is to restore as quickly as possible the quality of life of those affected so that they are able to continue functioning as part of the wider community.*

In the medium to long term the aim is to seek the regeneration of a community by addressing the economic, social, natural, and built environmental effects of an emergency. This may take a short time or many years, possibly decades.

In the case of a national emergency, central government will appoint a National Recovery Manager, and possibly set up a national recovery office and appoint a group Recovery Coordinator to provide administrative assistance.

Generally, government assistance in recovery will only be considered in circumstances involving emergencies of an unusual type or magnitude, and will be made available only when recovery is beyond the capacity of the local community.

## **E.3 Central Government Assistance**

The aim of any government assistance is to provide the minimum level of assistance required to restore the capacity for self-help to the community and to provide the most appropriate long-term solutions. This does not imply an obligation to restore a community to a better state than existed before the emergency, and nor is there an obligation to restore to previous levels if those are not sustainable in the longer term.

Government assistance would typically be considered in the following circumstances:

1. Recovery procedures cannot be carried out without government assistance;  
or
2. There is a statutory requirement for action, or a need to invoke a statute to achieve the ends desired from the recovery process; or
3. Government assistance will aid the co-ordination of the recovery process to a significant extent; or
4. There are advantages of economies of scale.

Central Government assistance normally takes the form of:

- A. Emergency food, housing, and welfare assistance for affected people where this assistance is not available from other sources or agencies; and
- B. Transportation assistance if evacuation becomes necessary; and
- C. Restoration of those services and facilities that are the Government's responsibility to provide (for example, schools and highways); and
- D. Assistance in the assessment and appropriate restoration of those services and facilities that other agencies are responsible for providing if—
  - a. insurance cannot be obtained; or
  - b. the responsible agency cannot effect restoration within an appropriate time frame; and
- E. Technical assistance with respect to other damage (this will normally be restricted to providing additional expertise to assist in the detailed assessment of damage, establishing procedures, and any necessary support to expedite insurance claims and damage repair, and, if necessary, temporarily providing additional labour to expedite clean-up operations); and
- F. Coordination of the response from government through the Director and, if necessary, the appointment of a Recovery Co-ordinator and the staff and facilities necessary for the Recovery Co-ordinator to carry out his or her role.

Arrangements for government financial support for emergencies are determined by Cabinet. The provisions for government financial support apply whether or not there is a state of national emergency or a civil defence emergency of national significance.

Excepting the costs of the response and immediate welfare needs, which are generally reimbursed fully, Central Government policy is to reimburse 60 percent of other eligible response costs, combined with essential infrastructure recovery repair costs, above a threshold of:

- 0.0075 percent of the net capital value of the city council, district council or unitary authority involved;
- 0.002 percent of the net capital value of unitary authorities where the assets in question are of a type that ordinarily are managed by regional councils; or
- 0.002 percent of net capital value in the case of regional councils.

The Ministry of Social Development can provide civil defence relocation and reestablishment grants to low-income, uninsured families who have had their homes destroyed or damaged as a result of an adverse event. These grants provide assistance with replacements of essential household items (such as fridges, washing

machines, beds) and essential costs associated with moving to a new location. The authorisation of these grants is at the discretion of Cabinet.



## **Appendix F: Flood Warning System**

### **F.1 Summary of Existing Flood Warning System**

Warnings of potential flood events will normally be received from one of the following sources:

- Metservice (heavy rain warning).
- Environmental Monitoring & Investigations Department (rainfall gauges and river flow recorders).
- Field staff.
- Members of the public.

In a significant flood event, the Flood Manager disseminates information directly to the regional and local civil defence organisations. Other information pathways include radio, television, telephone and other public organisations who, after receiving a flood forecast, disseminate flood warnings to people potentially affected. Those who receive flood warnings then determine the degree of response needed, and the actions and responses needed. With the exception of the River Watchers group and a list of landowners that Flood Protection has agreed to contact, Flood Protection does not have a responsibility to issue flood warnings to the general public or to the media. These warnings are the responsibility of the Territorial Authority (TA) or, in the case that a Regional Civil Defence emergency is declared, the Wellington CDEM group.

### **F.2 Flood Detection**

Flood detection starts with the detection of heavy rainfall capable of leading to an increase in river levels. Several methods are available to predict if and how river levels may react to a heavy rainfall event, such as manual estimations, computer modelling, and past experience. The Council currently uses telemetered river level recorders and telemetered rainfall information to provide the necessary data to predict river levels and hence a flood. Council does not currently operate a flood forecasting system.

### **F.3 Flood Warning Time**

The warning time is how long a person subject to a flood has to react. The warning is determined by a combination of flood detection and recognition, plus the time taken to issue warnings and take action. The warning time in Waikanae is generally quite short (about two and half hours from when the alarms activate).

Improving warning times is difficult due to the nature of the Waikanae River Catchment. Alarm settings are currently based on two settings of 15mm and 20 mm/2 hours at the Warwick's, Waikanae WTP and Kapakapanui rain gauges. Alarm settings are reviewed in line with any updates to the Hydrotel rainfall-runoff model.

Certain water levels at the Waikanae WTP recorder trigger alarms and warning actions. These levels are provided by GW Environmental Monitoring to GW Flood Protection and to KCDC.

#### **F.4 Back-Up Systems**

Rainfall alarms are based on a network of three rainfall gauges. This is considered to give sufficient redundancy for alarm and flood prediction purposes.

The river level gauge at the WTP has been rebuilt with two river level recorders, each with a separate communications system.

Flood warning and response procedures are described in detail in Flood Protection's Flood Procedures Manual. The 2007 version is currently under review.