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Hutt River Floodplain Management Plan

Principles for Non-structural Measures

Attachment 1 to Report 00.460

June 2000

1. Introduction

This document covers broad principles supporting a range of non-structural measures recommended for:

- including as provisions in district plans
- additional information to support the provisions and voluntary actions
- adopting as emergency management measures.

The document includes:

- summary of River Corridor and Floodplain hazard areas, which determine how land use activities are affected in those areas
- principles supporting a mixed criteria and zoned-based approach for land use regulatory methods in the upper catchment, river corridor, and floodplain
- general requirements for emergency management measures
- voluntary land use methods, including general information required to support methods
- transitional measures as structural measures are implemented
- definitions

2. Basis : River Corridor and Floodplain Hazard Areas

River Corridor

The River Corridor contains:

- Primary River Corridor Hazard Zone
 - PRC Flooding Area
 - Baserock Erosion Area
 - Alluvial Erosion Area
 - Narrative Erosion Area
- Secondary River Corridor Hazard Zone

The River Corridor is confined by the:

- outside toe of existing and proposed stopbanks
- 2800 cumec flood extent where no stopbank exists or is proposed
- the erosion hazard areas where they exist outside the 2800 cumec flood extent
- landward line of existing developed areas

Floodplain Risk Areas

These floodplain areas comprise:

- Higher Risk Floodplain Areas (not protected by stopbanks)
- Moderate Risk Floodplain Areas (protected by 2300 stopbanks)
- Lower Risk Floodplain Areas (protected by 2800 stopbanks)

Including Hazard Information in District Plans

The River Corridor Plans and Floodplain Risk Area Maps form the basis for assessing the flood hazard risk. These plans will need to be included in the District Plans to support recommended land use provisions provided below.

3. Explaining Flood Hazard Effects

Defining Adverse Flood Hazard Effects

Flood hazard effects include both one-off and cumulative effects¹. They involve:

- diverting, blocking or displacing flood flows
- introducing debris to flood flows
- increasing erosion and sediment supply from the upper catchment
- increasing peak flows in flood events

Consequences of Flood Hazard Effects

Flood hazard effects have potential to cause:

- damage to flood protection structures and works
- rising upstream flood levels which may compromise flood defence system effectiveness
- loss of flood storage and flow buffering areas
- damage to other structures and land
- *ultimately*, reduced safety for individuals and the wider community

Mitigating Flood Hazard Effects

Flood hazard effects can be mitigated by:

- elevating floor levels
- elevating building sites
- building relocatable structures
- strengthening buildings and structures to withstand flood hazard effects
- providing structural protection

4. Principles for Non-structural Measures: A Summary

Proposed non-structural measures are considered under the following use categories and activities, or locations.

- 1. Measures for the Upper Catchment**
- 2. Habitable buildings**

¹ The term 'effect' is defined by s.3 of the Resource Management Act 1991.

- 3. Accessory buildings and ancillary structures**
- 4. All other buildings**
- 5. Subdivision**
- 6. Earthworks**
- 7. Hazardous substances**
- 8. Critical facilities**
- 9. Capacity of new bridges**
- 10. Information on Property Titles**
- 11. Voluntary Actions and Emergency Management Measures**

5. Land Use Measures

5.1 Measures for the Upper Catchment

Rate of Earthworks

UHCC will have the ability to control the annual rate of earthworks, as requested in the WRC submission on the UHCC Proposed District Plan.

Policy in District Plan

Policy in the UHCC District Plan will clearly recognise:

- flood hazard management responsibilities between UHCC and WRC
- general effects on the flood risk

5.2 Habitable Buildings

Primary River Corridor

Constructing any habitable building in erosion hazard areas will not be permitted.

OR

Constructing any habitable building to the 2300 cumec standard on land zoned for that purpose will require 1900 (developed areas) or 2300 (greenfields areas) standard erosion protection to be provided.

The land owner or developer will provide protection. Ongoing maintenance and ownership responsibilities, and costs, will also need to be considered. The protection standard will be either the 1900 or 2300 standard depending on the location, but would still require a buffer area of 20–30m behind the erosion protection structures to maintain them.

This second option is unlikely to be feasible for single lot developments because the required erosion protection standard is very expensive to provide. Criteria needs to clearly identify the significant requirements associated with building in these areas. Despite being protected from erosion, severe flow effects also make these areas highly unsuitable for building habitable dwellings. This option would need strong policy backing discouraging building in erosion hazard areas and the remaining Primary River Corridor, reflecting prevailing floodplain management philosophies.

This option is more suitable to Belmont, rather than Birchville or Te Marua. It is unwise floodplain management practise to artificially hold the river's alignment in undeveloped areas, like Te Marua. The 20–30 metre buffer would also preclude new buildings in the Baserock Erosion Area at Birchville.

Constructing habitable buildings in the Primary River Corridor will be strongly discouraged.

Remaining River Corridor

Mitigating Flood Hazard Effects

Constructing habitable buildings in greenfield areas currently zoned for that use will require 2300 flood event effects to be mitigated.

Constructing new habitable buildings will be discouraged in areas not currently zoned for that land use.

No Adverse Flood Hazard Effects Caused

Constructing habitable buildings will require adverse flood hazard effects to be avoided or mitigated.

Mitigation Methods

Stopbanking for multiple lot development is acknowledged as a mitigation measure, although it is not considered a sensible floodplain management planning solution for new development in greenfield areas. Considerations for new stopbanks include:

- any significant diversion effect to adjacent land and structures
- any significant loss of flood storage
- construction standards
- river edge protection works to protect stopbanks
- who owns and operates the structures
- who pays for ongoing maintenance and repair
- providing ability to disperse ponded flood waters
- providing for residual risk

Habitable buildings intended for sites adjacent narrative erosion areas may need erosion protection provided, with provision made for ongoing maintenance of that protection. Individual buildings will be discouraged from siting in these locations.

Higher Risk Floodplain Areas

Mitigating Flood Hazard Effects

All new habitable buildings and significantly redeveloped habitable buildings will be required to mitigate the flood effects of a 1900 cumec flood event.

Developers and land owners will be strongly encouraged to mitigate the effects of a 2300 cumec flood event.

Low to Moderate Risk Floodplain Areas

Mitigating Flood Hazard Effects

Developers and land owners protected by stopbanks will be encouraged to consider mitigating the effects of flooding from stopbank breaches or overflows.

5.3 Accessory Buildings and Ancillary Structures

Primary River Corridor and Higher Risk Floodplain Areas Associated with Residential Zones

Building Permitted

Accessory buildings and ancillary structures will be permitted in erosion hazard areas and higher risk floodplain areas currently zoned for residential purposes.

Mitigating Flood Hazard Effects and Alternative Sites Encouraged

Where practicable, developers and land owners will be encouraged to site accessory buildings and ancillary structures outside the erosion hazard areas and flow paths. Where alternative siting is not possible or desired, encouragement will be given to:

- strengthen buildings/structures to withstand flood hazard effects
- elevate floor levels
- build relocatable buildings

Remaining River Corridor

No Adverse Flood Hazard Effects

Accessory buildings and ancillary structures will require adverse flood hazard effects to be avoided or mitigated.

The setback distance from flood protection structures, and dimensions and orientation of structures, will determine whether effects are likely to be minor.

Mitigating Flood Hazard Effects and Alternative Sites Encouraged

Where practicable, developers and land owners will be encouraged to site accessory buildings and ancillary structures outside the Primary River Corridor.

Where alternative siting is not possible or desired, encouragement will be given to:

- strengthen buildings/structures to withstand flood hazard effects
- elevate floor levels
- build relocatable buildings

5.4 All Other Buildings excluding Habitable Buildings, Accessory Buildings and Ancillary Structures

Primary River Corridor

Constructing any building (including habitable buildings) in erosion hazard areas will not be permitted, excluding accessory buildings and ancillary structures.

OR

Constructing any building (excluding accessory buildings and ancillary structures) in the Primary River Corridor is non-complying.

Any building will need to provide erosion protection, and ongoing maintenance and ownership responsibilities, and costs, will also need to be considered. The protection standard will be either the 1900 or 2300 standard depending on the location, but would still require a buffer area of 20–30m behind the erosion protection structures to maintain them.

The second option applies to out of zone (non-complying) activities.

This second option is unlikely to be feasible for single lot developments because the required erosion protection standard is very expensive to provide. Criteria needs to clearly identify the significant requirements associated with building in these areas. Despite being protected from erosion, severe flow effects also make these areas highly unsuitable for building habitable dwellings. This option would need strong policy backing discouraging building in erosion hazard areas and the remaining Primary River Corridor, reflecting prevailing floodplain management philosophies.

This option is particularly unsuitable for greenfield areas. It is unwise floodplain management practise to artificially hold the river's alignment in undeveloped areas, like Te Marua. The 20–30 metre buffer would also preclude new buildings in the Baserock Erosion Areas .

Constructing buildings in the Primary River Corridor will be strongly discouraged.

Remaining River Corridor and Higher Risk Floodplain Areas

New Buildings Discouraged

Land owners and developers will be strongly discouraged from siting new buildings in the River Corridor. Exposing new buildings to the flood hazard in high risk areas represents unwise floodplain management planning. Selecting alternative sites away from the River Corridor will be encouraged.

No Adverse Flood Hazard Effects

All buildings and associated site modification must not cause flood hazard effects

Compatible with HRFMP Environmental Strategy

Buildings in the River Corridor need to be compatible with the predominant uses in the river corridor including open space, recreation and rural activities. These uses are also generally consistent with the Linear Park concept, and general vision for the river corridor area promoted through the HRFMP Environmental Strategy.

River Corridor Land Remaining in Public Ownership

Land should remain in public ownership enabling:

- flood hazard effects to be more easily managed
- land uses to be actively discouraged from siting in the River Corridor.

Buildings Associated with Strong Community Reliance

Managing the 2300 Flood in Greenfield Areas

New buildings constructed in greenfield areas currently zoned for that land use will require mitigating the effects of a 2300 flood event.

Managing the 1900 Flood in Existing Developed Areas

New buildings and significantly redeveloped buildings in areas already developed will be required to mitigate the effects of a 1900 flood event.

Land owners and developers will be strongly encouraged to mitigate the effects of a 2300 flood event.

Buildings with Lesser or No Measurable Community Reliance Which Concentrate People

Developers and land owners will be strongly encouraged to mitigate the 2300 cumec event effects for new buildings that concentrate people infrequently. These buildings include community halls, sports clubrooms, and smaller scale commercial and industrial developments.

Buildings Adjacent Narrative Erosion Areas

Providing Erosion Protection

Land owners and developers may need to provide erosion protection and the ongoing maintenance of that protection, for buildings intended on sites adjacent to narrative erosion areas. Erosion protection requirements are additional to mitigating other flood hazard effects.

Individual buildings will be discouraged from siting in these locations because it may not be feasible to provide erosion protection for single houses. Considerations for new erosion protection include:

- construction standards
- who owns and operates the structures
- who pays for ongoing maintenance and repair
- providing ability to disperse ponded flood waters
- providing for residual risk

Low to Moderate Risk Floodplain Areas

Mitigating Flood Hazard Effects

Developers and land owners protected by stopbanks will be encouraged to mitigate the effects of flooding from stopbank breaches.

5.5 Subdivision

River Corridor and Higher Risk Floodplain Areas

Erosion Hazard Areas : Purpose is Constructing Habitable Buildings

Subdivision in erosion hazard areas where the purpose is to construct new habitable buildings will not be permitted.

Restrictions Outside Existing Zones

Subdividing land intended for uses outside existing zones will be non-complying, apart from minor boundary adjustments.

New Subdivision Discouraged

Subdivision will be strongly discouraged where the resulting uses expose people and assets to an increased flood hazard level.

5.6 Earthworks

River Corridor and Higher Risk Floodplain Areas

No Adverse Flood Hazard Effects Caused

Earthworks, including filling and excavation, will be required to avoid or mitigate adverse flood hazard effects.

The setback distance from the stopbank, volume and orientation of earthworks will determine whether effects are likely to be minor.

5.7 Hazardous Substances

River Corridor and Higher Risk Floodplain Areas

Existing Areas Zoned for Using Hazardous Substances

Securing Stored Substances

Stored hazardous substances must be secure in a 1900 cumec flood event.

Additional Mitigation Encouraged

Developers and land owners will be given information to mitigate to the effects of a 2800 cumec flood event.

New Uses Discouraged

Intended new commercial and industrial land uses that require hazardous substances as a key part of their daily operations will be discouraged from siting in the River Corridor.

5.8 Critical Facilities

River Corridor and Higher Risk Floodplain Areas

Healthcare Facilities and Emergency Services Managing Flood Effects

New in-patient healthcare facilities will be required to show they can operate services in a 2800 cumec flood event.

New out-patient facilities and emergency services will be required to produce contingency plans detailing how they will manage a 2800 cumec flood event.

Alternative Siting Encouraged

Alternative siting of healthcare facilities and emergency services away from higher and moderate risk floodplain areas will be encouraged.

Key Network Utilities Managing Flood Effects

Key network utility facilities will be required to ensure they can operate in a 2800 cumec flood event. Alternative siting away from the River Corridor will be promoted.

Moderate and Lower Risk Floodplain Areas

Emergency Services, Healthcare Facilities and Network Utilities Managing Flood Effects

New and existing in-patient healthcare facilities will be required to show they can operate services in a 2800 cumec flood event with breaches.

New and existing out-patient facilities and emergency services will be encouraged to produce contingency plans detailing how they will manage a 2800 cumec flood event with breaches.

5.9 Capacity of New Bridges

Passing the 2800 cumec Flood

New bridges will be required to pass a 2800 cumec flood without adversely affecting any flood defences, or raising upstream flood levels. Akatarawa Bridge (Birchville) is excluded from the 2800 cumec requirement.

5.10 Information on Property Titles

Tagging hazard information on new property titles

Hazard information will be tagged on new property titles where proposed structural works would not protect those properties from:

- an identified river erosion hazard²
- a 2300 flood event affecting greenfield areas, or 1900 event in existing developed areas.

5.11 Voluntary Actions and Emergency Management Measures

Upper Catchment

1. Monitoring and investigating vegetation clearance and soil excavation in the upper catchment.
2. Forwarding forestry development and harvesting notices to WRC
3. Monitoring land use changes
4. Monitoring rural subdivision
5. Developing WRC policy affecting WRC upper catchment land
6. Developing WRC policy to manage the flood risk in the upper catchment

River Corridor

1. Provide information for a range of flood scenarios to support:
 - constructing ancillary structures and accessory buildings
 - constructing other buildings to the 2300 flood standard, and siting in alternative locations

Floodplain

1. Provide information for a range of flood breach scenarios affecting moderate and lower risk areas to support:
 - constructing buildings to manage flooding effects, including ponding and flow
 - appropriate siting of emergency services
 - placing fill

² Uses sections 221(1) and 224(c) of the Resource Management Act 1991 to achieve this.

2. Providing information for the 2300 cumec event affecting higher risk areas to support
 - constructing ancillary structures and accessory buildings to withstand flow effects
 - constructing habitable buildings to manage flood effects

Emergency Management

1. ***Review Measures Regularly***

Conduct regular reviews of all emergency management programmes and procedures to ensure they are:

- relevant
- current
- appropriate

2. ***Covering extreme events***

Ensure measures adequately cover extreme flood events beyond the design standard event.

3. ***Programming enhancements***

Plan to enhance measures identified during the initial review of emergency management measures (December 1999 to March 2000). Considerations include:

- options for enhancing measures
- time-frames for implementation
- funding and resourcing requirements
- expected outcomes

4. ***Considering time-frames for structural measures***

Provide information on the timing for structural works. A focus should be on milestones when works significantly improve safety of floodplain areas.

5. ***Providing information***

Provide the community simple, visual, correct, and accessible information.

6. ***Prioritising Communities at Risk***

Ensure that people in flood prone areas are receiving an acceptable level of emergency management information and advice. Residents in higher risk floodplain areas are first priority to receive new information and advice.

7. ***Modifying information according to risk***

Modify advice and information to highlight differences in the risk and likely consequences of flooding across flood prone areas.

8. ***Improving connections with the media***

Improved links between the media and emergency managers are necessary to ensure the community has basic and accurate information during and following flood events.

9. ***Improving links with emergency services***

The councils and emergency services need a co-ordinated approach to emergency management.

Providing Information to Support Voluntary Actions

WRC will provide flood hazard information to UHCC and HCC, and directly to the community where appropriate. UHCC and HCC have the primary responsibility for passing information directly to the community.

Information will include:

- Floodplain Risk Area Maps
- River Corridor Plans
- Flood extent maps
- More detailed depth and flow information for all flood prone areas.

This information will be re-produced through LIMS and PIMS³ as appropriate.

Flood hazard information should also be provided in brochures on flood risk, targeting localised areas. Basic emergency management material targeting local areas will support this information to provide a full round-up of non-structural measures.

Brochures describing localised floodplain management planning measures are intended as support for the Plan document. They would be produced by WRC, and would not be immensely detailed. Therefore both HCC and UHCC would need to consider producing more detailed information in a promotional form.

³ Including all publicly available hazard information in LIMS and PIMS is a statutory requirement. Guidance may be given for the way this information is presented.

5.12 Transitional Measures

Transitional measures are required for areas that will be affected by improved structural protection proposed under the Hutt River Floodplain Management Plan. Measures shall remain in place until works are completed for each affected area.

Tagging Hazard Information on New Property Titles

Hazard information will be tagged on new property titles exposed to the flooding hazard, until programmed structural measures improving protection are completed. The flood hazard information will equate to:

- an identified river erosion hazard⁴
- a 1900 cumec flood event

Tagging Information on Property Titles for New Buildings and Significant Extensions

Hazard information will be tagged on property titles for new building or significant extensions where buildings will be exposed to the flooding hazard, until programmed structural measures improving protection are completed. The flood hazard information will equate to:

- an identified river erosion hazard⁵
- a 1900 cumec flood event

This measure would not apply to accessory buildings or ancillary structures.

Emphasis on Emergency Management Measures

Strong emphasis will be placed on emergency management measures until all structural measures are in place.

River Corridor Boundary at Belmont

Sections of the River Corridor boundary at Belmont will be moved riverward to an appropriate position, following completion of bank edge protection works proposed under the Hutt River Floodplain Management Plan.

⁴ Uses sections 221(1) and 224(c) of the Resource Management Act 1991 to achieve this.

⁵ Uses section 36(2) of the Building Act 1991 to achieve this.

6 Definitions

The **2300 cumec flood event** is the risk-based design standard recommended to the Wellington Regional Council by an advisory committee of political representatives from the Regional Council, Hutt City Council and Upper Hutt City Council. The 2300 cumec flood equates to the flow measured at Taita Gorge.

The **2300 cumec flood standard** is a standard of flood hazard mitigation. It requires that development mitigate the effects of the flood hazard using appropriate solutions (identified in section 3)

Flood prone areas includes the river corridor and any land on the floodplain affected by a flood event with breaches.

Mitigation options to meet the 1900 and 2300 cumec flood standard include, but are not limited to:

- flood proofing
- elevating sites
- building up floor levels
- strengthening structures

Habitable buildings are buildings that people use for a range of living activities including sleeping.

Accessory buildings means a building which is not part of the principal building on the site, the use of which is incidental to the principal building(s) on the site. Where no principal building is erected on a site, it is a building accessory to the use of the principal building permitted on the site. Accessory buildings include, but are not limited to:

- a tool or garden shed
- garage
- playroom
- recreation room
- glasshouse
- swimming pool
- spa pool
- buildings accessory to rural land uses
- buildings for providing utility services
- accessory buildings constructed for industrial or commercial land uses

Accessory buildings do not include any habitable buildings or rooms.

Ancillary structures include, but are not limited to:

- fences
- posts
- railings
- street light poles

Ancillary structures also include any network utility structure, other than a building.

Other buildings are not habitable buildings, accessory buildings or ancillary structures. They include, but are not limited to:

- industrial and commercial buildings
- buildings used for education and public assembly, and other buildings which concentrate people
- healthcare and emergency service buildings
- buildings used for recreation

Critical facilities are essential facilities that add a whole dimension to the consequences of a flood event situation should the facilities be inundated. They include emergency services, emergency assembly points, hospitals, nursing homes, network utilities, hazardous waste facilities, facilities housing crucial records, and the like.

For habitable buildings **significant redevelopment** means large extensions or rebuilding around 40 % or more of existing habitable floor area in any one redevelopment phase.

Flood hazard effects include both erosion and flooding effects.

Minimising adverse effects means taking all practical and reasonable steps to limit adverse effects. This implies allowing minor effects, but does not mean that all adverse effects must be eliminated.

Strong community reliance occurs where the community will experience significant disruption due to flood damages. The community can be reliant on goods and services sold in the building, employment associated with the building, or services supplied by the building that regularly concentrate people, such as education facilities.

Greenfield areas include land zoned for that purpose but not presently developed, such as residential zoned land upstream of Birchville.

Existing developed areas refer to those areas that are already developed with intensive land uses.

Flood defences are physical features that protect the community from flooding. They include stopbanks, river berms protecting stopbanks, and bank edge protection works.