greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

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Committee	Hutt Valley Flood Management Subcommittee
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Updating the Wainuiomata River Flood Hazard Information - Progress Report and Consultation Process

1. Purpose

To advise the Subcommittee of updated flood hazard information available for the Wainuiomata River floodplain. To seek endorsement for changes to the Flood Hazard Information Sheets, and approve the proposed community consultation process.

2. The decision-making process and significance

The matter requiring decision in this report has been considered by officers against the requirements of Part 6 of the Local Government Act 2002.

2.1 Significance of the decision

Officers have considered the significance of the matter, taking the Council's significance policy and decision-making guidelines into account. Officers recommend that the matter be considered to have low significance.

Officers do not consider that a formal record outlining consideration of the decision-making process is required in this instance.

In making this assessment Officers are not seeking to assess the importance placed on the issue by specific individuals, groups or agencies in the community. Officers acknowledge that the matters referenced in this report may have a high degree of importance to affected or interested parties.

3. Background

On 23 June 2011 options for updating the Wainuiomata River flood hazard were put to the Hutt Valley Flood Management Subcommittee (Report 11.228).

The Subcommittee subsequently recommended to Council that budget is made available for Option 2 in the 2011/12 Annual Plan.

Council approved additional funding of $100,000 for hazard mapping across the region, including Hutt Valley, Wainuiomata, Kapiti and Wairarapa at the Council meeting of 29 June 2011 (Report 11.278).

From within this funding Council undertook remapping of the flood hazard based on Option 2, as recommended in Report 11.228.

Option 2 is detailed as follows:

Plot current flood level into LiDAR to get refined flood extents and depths. Re-publish the information sheets with the updated information, mail out to all affected landowners, and make available for HCC LIMS.

- Plot current flood hazard extent over LiDAR using 2000 hydraulic model levels.
- For missing LiDAR area use the historic terrain from the original model.
- Use existing erosion hazard and structural damage lines, with minor refinements.
- Present the information as the more accurate flood hazard area and without the water depth classes shown.
- Re-publish the information sheets with the updated information, mail out to all affected landowners, and make available for HCC LIMS.

An update of the hydraulic modelling has been carried out, and a modelling report produced. A presentation showing the results of the hydraulic modelling report will be given to the Subcommittee at the meeting on 1 December 2011.

4. Comment

Updated Hydraulic Modelling

The hydraulic modelling process carried out has exceeded the requirements detailed in Option 2 (above). The main points of variance are as follows:

- An updated hydrological analysis was carried out using the 13 years of extra data available (since the 1998 analysis used in the original model) and the rating curve for the flow meter at Leonard Wood Park updated.
- The model was recalibrated and refined using the available data that was collected from the 2004 flood event.

- Further flood level data was collected following meetings with a number of the local residents and used in the recalibration of the model.

As a consequence, based on the results of comparison of the calibration runs and the comparison of the aerial photos with the flood spread, we have a high level of confidence that the model is producing results within an acceptable level of accuracy for the production of flood hazard maps.

Purpose of the Hazard Maps and Map Comparisons

The purpose of the flood and erosion hazard information is to identify areas where new development should be avoided. Where development does take place it needs to be compatible with the flood risk.

A comparison between the results of the 2000 flood hazard and the updated (2011) flood hazard is included as Attachment 1. Note that for planning purposes and avoiding future development in flood hazard areas, the flood extent of both models is relatively similar. Due to the nature of the modelling and differences in the model input data (hydrology and LiDAR), there are, however, differences in the modelled flood depths.

Updated Flood and Erosion Hazard Information Sheets

The Flood Hazard information to be shown on the updated Flood and Erosion Hazard Information Sheets will be given as a graduated change in colour (as in Attachment 1) instead of the depth classes shown on the November 2010 maps.

Hutt City Council (HCC) has formally undertaken to protect and repair Coast Road in the event of an erosion problem, so the Erosion Hazard Area on the updated Flood and Erosion Hazard Information Sheets will be adjusted to Coast Road rather than crossing the road.

The structural damage area in the 2000 report and on the November 2010 Flood and Erosion Hazard Information Sheets was based on flood velocity and flood momentum (which is a combination of water depth and velocity). The flood velocity information is not available from the updated modelling, and the water depths have changed, which means that the Structural Damage Area shown on the 2000 report is no longer valid. The updated Flood and Erosion Hazard Information Sheets will not show a Structural Damage Area. The potential for structural damage will be considered on a site specific basis on request.

Updated draft Flood and Erosion Hazard Information Sheets will be presented to the Subcommittee on 1 December 2011.

Climate Change

Climate change has not been included in the modelling to date. However, as the hydraulic model has been updated, calibrated and refined it is recommended to extend the hydrologic analysis to include climate change, and rerun the hydraulic model. As climate change increases the rainfall intensity

and allows for sea level rise, this will increase the flood spread and water depths from those shown for the remodelled flood spread shown in Attachment 1.

An initial model run to show an 'order of magnitude change' due to climate change based on a 20% increase in discharge is being carried out. The results of this to will be given in the Subcommittee presentation on 1 December 2011.

5. Proposed Amendments to the Hazard Information Sheets

Resulting from the information in this report, staff propose the following:

- Climate change is included in the model before the updated information is released to the public.

- That the flood hazard information on the updated Flood Hazard Information Sheets be shown as a graduated change in colour (as in Attachment 1) instead of the depth classes shown on the November 2010 maps.

- That the structural damage area shown in the 2000 report is removed before updated Flood Hazard Information Sheets are released to the public.

- Where future development is being considered within the flood hazard area, the potential for structural damage should be considered on a site specific basis.

6. Communication

On 23 September, staff met with residents of 6 properties to investigate observed flood levels from the 16 February 2005 flood for model calibration.

A meeting was also held on 31 October 2011 with 6 residents of Coast Road to discuss the draft flood maps. Notes from the 31 October meeting are included as Attachment 2.

Proposed Consultation Process

The proposed process for consultation regarding the Wainuiomata Flood Hazard is:

1. Prepare draft hazard maps showing the remodelled flood hazard and the adjusted erosion hazard. ***(Action: November-December 2011).***

2. Inform Councillors and HCC staff about this information and work with them to refine the wording to be given in the LIM reports ***(Action: December 2011).***

3. Mail the draft hazard maps with a cover letter to all affected residents, with information about a drop-in/information session to be held in early February ***(Action: December 2011).***

4. Hold drop-in information/discussion evening at a public venue in Wainuiomata ***(Action: February 2012).***

5. Finalise hazard maps and updated information sheets, mail to affected landowners and make these available for HCC LIMS ***(Action: March 2012)***.

7. Recommendations

That the Subcommittee:

1. ***Receives*** *the report.*

2. ***Notes*** *the content of the report*

3. ***Endorses*** *the proposed amendments to the Flood Hazard Information Sheets as proposed in Section 5 of this report.*

4. ***Supports*** *the Consultation Process proposed in Section 6 of this report.*

Report prepared by:	Report approved by:	Report approved by:
Sharyn Westlake Senior Engineer, Strategy and Advisory Specialist	Jan van der Vliet Team Leader Investigations, Strategy and Planning	Graeme Campbell Manager, Flood Protection

Report approved by:

Wayne O'Donnell
General Manager, Catchment Management

Notes from the meeting with Wainuiomata residents held on 31 October 2011.

Present:

Residents: Bill Voisey, Godfrey Fernandez, Shane Edwards, Ian Turner, David Lewis, Ken Jackson

GWRC: Matthew Gardner, Sharyn Westlake

Matthew Gardner explained that the hydrology for the Wainuiomata Valley has been updated by Consultants to reflect the last 10 (or so) years of information and the updated hydrology used as input for the reruns of the hydraulic model for the Wainuiomata River flooding. He also explained his flood modelling methodology and calibration, and showed draft flood maps and comparison with the aerial photographs from the February 2004 floods.

Points of discussion:

- Hydrology used for the modelling was discussed. GWRC noted rainfall is not uniform across the valley, and the new hydrology used for draft flood maps represents this variation.

- Availability of information from the Catchpool rainfall gauges - available from Rural Fire. GWRC stated Catchpool information taken into account by Consultants who carried out the update of hydrology.

- How the flood maps are presented. These are currently in blue with deeper areas shown darker. Discussion was around

    - Should there be a key for water depth?

    - Should the river channel be shown in a different colour, with different depth zones across the floodplain?

    - Should lines be shown across the floodplain (at house locations) with different depths shown at points on the lines?

- Flood spread is shown across the houses - this does not necessarily mean that a house may flood. The model does not pick up houses. GWRC noted that all flood maps have a similar representation - i.e. flood spread shown over the house for the aerial photo background.

- Will the maps for consultation have the same legend as previously? These include potential bank erosion, structural damage area, erosion hazard area and major tributaries? To be confirmed by GWRC, however initial thoughts are that the erosion hazard area is likely to be similar as that is mapped from the river meanders and where Hutt City Council have undertaken to protect the road, the erosion hazard line will likely move to the road edge. The structural damage area may change depending on the information available from the remodelling, as it is based on river velocity and water depth.

- The margin of error for the model was discussed, the allowance of freeboard queried and also whether the allowance for freeboard is too high.

- GWRC noted that freeboard of 0.6m was used for the model. This was not changed from the 2000 model and analysis of how the freeboard was determined is included in the 2000 modelling report. Freeboard is defined as an allowance to take account of the uncertainties associated with:

- Precision of the modelling.
- Physical processes that have not been allowed for in the design water level, e.g. debris build-up, wave action, changes in bed level.
- Uncertainty in the prediction of physical processes (e.g. rainfall patterns) that affect the design water level.

The inclusion of a freeboard allowance provides an upper confidence level that ensures that the water levels will have a high degree of certainty of not being exceeded. It is intrinsic to the model, and should not be regarded as an 'optional extra'.

- GWRC noted that climate change is not included in the current draft maps. Current GWRC Flood Protection policy is to model an increase in rainfall intensity of 16% and sea level rise of 0.5m by 2100 for new hydraulic models. As this project was a re-run of the 2000 model, climate change has not been included yet. However, GWRC is looking at a project on the region-wide vulnerability to climate change, and an update of the Wainuiomata River flood hazard to include climate change is likely to be carried out (potentially in 2012).

- The process for consultation was queried, and 'where to from here'. Residents requested that maps of their property showing the flood hazard be sent to every resident. GWRC stated that the process for consultation has yet to be discussed, and is to go to the Economic Wellbeing Committee on 24 November for approval.