



**Report**            **04.144**  
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**Committee**       **Environment Committee**  
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## **The February floods - hydrology and meteorology**

### **1. Purpose**

To inform the Committee of the completion of two technical reports on the hydrology and meteorology of the February storms, and to summarise their key findings.

### **2. Strategic context**

This work supports the Take 10 Safety & Hazards success measure of *no major damage or loss of life from flooding*.

### **3. Background**

Hydrological analysis of floods can help us to issue appropriate flood warnings in the future, and to design effective flood protection measures. There were several storm events during February 2004 that affected many parts of the Wellington region. A report has been produced on the largest event that had region-wide impacts, which occurred on 15 and 16 February. At the request of Wellington City Council, a second technical report was produced on the heavy rainfall that caused localised flooding in Miramar on 17 February.

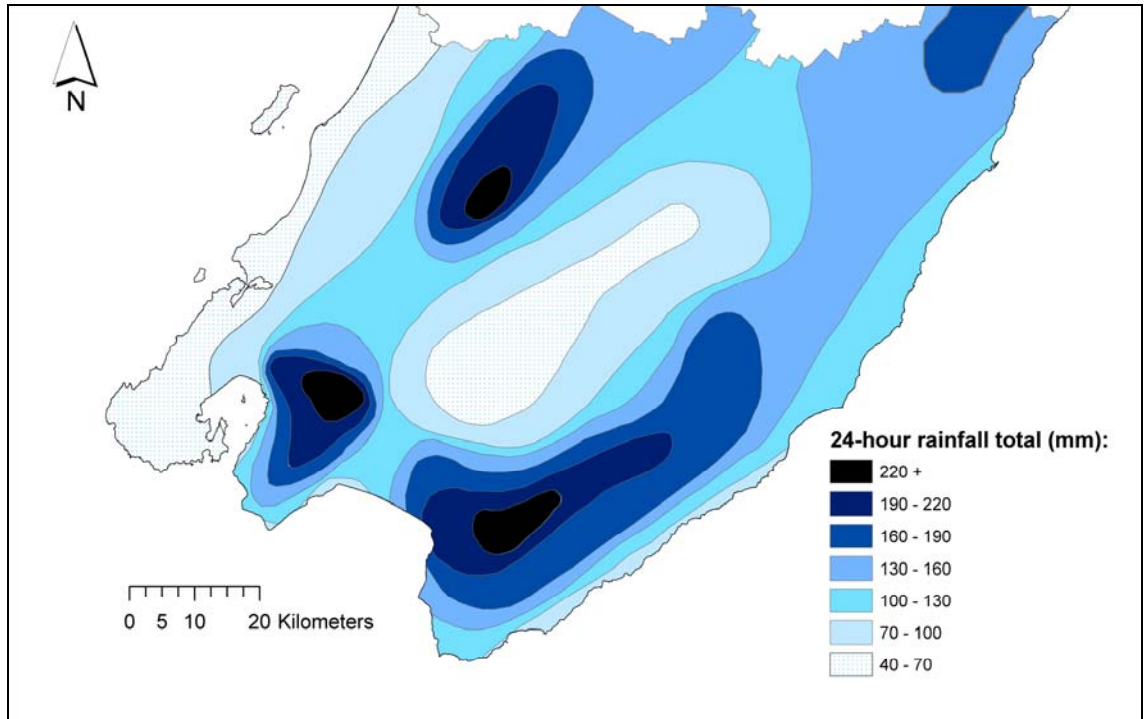
### **4. Summary of findings**

The storm on 15 and 16 February was caused by a low-pressure centre that deepened east of the North Island and drew in moist air from the tropics, resulting in rain and strong southeasterly gales. Overnight on 15 February a small but intense low moved in close to the Wairarapa coast and accentuated the wind and rain, with the heaviest rain occurring between midnight and 6 am on Monday 16 February.

The most rainfall during the storm occurred in the Aorangi ranges, Rimutaka ranges, Wainuiomata, Lower Hutt and parts of the Tararua ranges (Figure 1). However, the event was unusual in that the Tararua ranges did not receive the most intense rainfall, and that the low-lying area of Lower Hutt received such a

high rainfall total. The storm was also characterised by a long period of sustained rainfall rather than short intense rainfall.

**Figure 1: 24-hour rainfall totals for the Wellington region, from 8 am 15 February 2004**



The river flows that resulted from the storm were significant in many of the region's rivers, with the highest flows on record in some catchments. The return period of the peak flow was up to 50 years in the Waiwhetu Stream and Ruamahanga River, 30 to 50 years in the Wainuiomata River, and between 12 and 30 years for the eastern Wairarapa rivers. The high rainfall in the days leading up to the storm (creating wet antecedent conditions) and the prolonged nature of the rainfall contributed to the rivers peaking at such high flows.

The following day (17 February 2004) a low-pressure system moved across Wellington city bringing northwesterly rainfall. As the low moved away from Wellington a southerly airstream developed, and a convergence zone formed over Miramar and Seatoun. The convergence zone resulted in a brief period of very heavy rain in Miramar: there was 14.3 mm of rain in 10 minutes and 29.7 mm in the hour from 10 am. However, the rainfall was so localised that during the same period Wellington airport received only one-third of the rainfall that Miramar received. The rainfall intensity experienced in Miramar is estimated to have a return period of about 20 years.

## 5. Communications

The report on the 15-16 February 2004 storm event has been sent to territorial authorities and the Ministry of Civil Defence and Emergency Management. The report on the Miramar rainfall event of 17 February has been sent to

Wellington City Council. Copies of both reports are available to councillors on request.

## 6. Recommendations

*It is recommended that the Committee:*

1. *receive this report; and*
2. *note the contents.*

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