

R.J.Hall & Associates Ltd.
First Floor Harcourts Building
41 Sophia St.,
Timaru 7910

29 June 2020

Save Our Hills (Upper Hutt) Inc.

c/o Stephen Pattinson

27 Elmslie Rd.

Pinehaven.

Dear Steve

You have requested that I provide Save Our Hills with a summary of my investigations to date of the flood event in the Pinehaven Catchment on 8 December 2019 in relation to the proposed Pinehaven Stream channel upgrades.

In simple terms, the Upper Hutt City Council's proposed channel upgrades will have a flood carrying capacity greater than that required for a 1 in 100 year flood.

I can confirm that I have been engaged by Save Our Hills Inc. to provide advice on matters relating to the hydrology of the Pinehaven catchment and have previously supplied a detailed assessment of the possible consequences of urban development both current and potential on the hydrology of that catchment. The subsequent investigations which are summarised here are based on analysis of an intense rainstorm over the catchment in the early hours of 8 December 2019 which resulted in significant flooding in Pinehaven and its environs. The following statements made are a true and accurate representation of what we have been able to determine of that rainstorm as a consequence of it.

The Rainstorm / Flood Event 8 December 2019

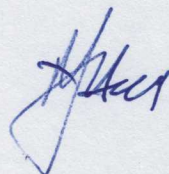
1. The GWRC automatic rain gauge located in the Pinehaven Reserve recorded some 52 mm in the two hours 3 am to 5 am, 8 December 2019.
2. Using the NIWA Hirds V4 Historic rainfall depth – duration – frequency tables this event had a 2 hour rainfall frequency in the order of 30 years.
3. The peak discharge in the Pinehaven Stream at the Dutch Reform Church footbridge has been estimated by us at between 11.4 and 11.7 cumecs.
4. Based on flood frequency relationships derived for that catchment by us we estimate the return period of that event to be in the order of a 1 in 23 to 1 in 25 year event.

On the basis of the above it is reasonable to conclude that the extent of the flooding experienced on the 8 December 2019 in Pinehaven and its environs was for all intents and purposes in the order of a 1 in 25 year flood event.

Further to that it is opined that the Wellington Water Ltd (WWL) flood mapping for a 1 in 25 year flood event clearly exceeds that which was experienced in the 1-in-25 year flood event that occurred on 8 December 2019. In our opinion, the flood flows calculated by WWL for a 1-in-25 year flood (both with and without the 20% increase in rainfall they have used to account for future climate change effects) actually exceed the flow of a 1-in-100 year flood.

In simple terms this means that the Upper Hutt City Council's proposed channel upgrades based on their design standard and Greater Wellingtons Regional Council's hydrology will in effect have a flood carrying capacity greater than that required for a 1 in 100 flood.

It is concluded that this disparity is a combination of both the overestimation of rainfall excess (rainfall runoff volume) previously reported and the use of a flood frequency relationship which is un-representative of this actual forested catchment.

A handwritten signature in blue ink, appearing to read 'Bob Hall', with a stylized flourish at the end.

Kind regards

Bob Hall

CMENGNZ (Civil)