

How Did the Councils Grossly Exaggerate the Pinehaven Flood Maps?

Greater Wellington Regional Council (in partnership with Upper Hutt City Council) has used inaccurate assumptions that exaggerate the Pinehaven flood maps:

1. GWRC's model assumes that the Pinehaven hills, instead of being covered with forest, are bare and hard. Therefore, in Council's model, nearly all rainfall runs off the hills ...



Instead of modelling the forest like this ...



Council modelled the forest as if it's like this!

Council's flood model assumes that during storms nearly all rainfall runs off the hills, causing massive flooding in Pinehaven and Silverstream. This isn't so. On-site tests have shown that the forest soaks up huge volumes of rainfall, significantly reducing runoff and flooding. Take the forest away, like Council did in their model, and flooding increases dramatically.

[MWH's Hydstra hydrological model of the Pinehaven catchment assumes 5mm Initial Loss and 2mm/hr Continuing Loss. By back-calculating, R J Hall & Associates Ltd found that this is equivalent to a CN (rainfall loss) value of CN96 in HEC-HMS, similar to an asphalt carpark. The forest has infiltration rates ranging from 500 to 900 mm/hr, determined by field tests.]

2. All the rainfall coming down off the hills in Council's model floods overland because Council's model assumes all channels upstream from Pinehaven Reserve are blocked up...



Instead of modelling the streams like this ...



Council modelled the streams totally clogged!

In Council's flood model, all stream channels in Pinehaven Rd Elmslie Rd, Forest Rd, Jocelyn Cres are clogged up; floodwater has nowhere to go except all over everybody's properties.

[In the upper catchment SKM's hydraulic model assumes Manning's $n = 0.2$ channel roughness]

3. Council's model blocks culverts ... then assumes extra flood depth again for blockages!



Council's flood model assumes all culverts up to 1.2m diameter are 100% blocked, sending floodwater out over roads and properties. This is one way of allowing for blockages in a storm.

But then Council increased the flood depth in their model a second time for blockages as another fudge factor.

4. Council's model assumes the 2.1m dia. pipe installed after the 1976 flood isn't there.



The photo (left) shows the 2.1m diameter pipes that were installed in Whitemans Road after the 1976 flood to improve drainage. By adding this large pipe alongside the existing 1.8m pipe, the capacity of the drainage down Whitemans Road was doubled.

But Council's model assumes both large pipes are 50% blocked, which is the same as assuming the newer one is 100% blocked. This effectively removes the new big pipes, making Council's model of the drainage system in Whitemans Road like it was before 1976.

5. Council's model assumes the Hulls Creek detention dam isn't there.



After the 1976 flood a detention dam was built to hold water from Heretaunga back so that during a big storm the water level in Hulls Creek would be low, allowing the Pinehaven Stream to empty out into Hulls Creek, reducing flooding in Silverstream. Council's model assumes a high water level in Hulls Creek (as if the detention dam isn't there), increasing flooding in Silverstream.

The combination of these wrong or inaccurate assumptions results in grossly exaggerated flood maps of the situation in Pinehaven and Silverstream as it is now (before any Guildford development on the hills). An inflated baseline model defeats 'stormwater neutrality' rules, resulting in two very negative outcomes for Pinehaven and Silverstream: 1) there will be much bigger floods in future if a large-scale Guildford development is built on the hills; and 2) ratepayers pay for dealing with Guildford's floodwater which Guildford should be dealing with on site. This is all because of Council's flawed model; the baseline model must be fixed!