Warning Signs from the Hills

Forestry Runoff, Debris and Flood-Modelling Risk in Pinehaven and Silverstream

Report on the 18 April 2026 Storm

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Executive Summary

On Saturday 18 April 2026, Pinehaven and Silverstream experienced another rapid, sediment-laden flood. Dirty brown water flowed across roads, into driveways and garages, through private properties, and over culverts and bridges. Several residents reported that the April flood rose quickly and, in some places, was worse than the similar flood two months earlier on 16 February 2026.

The importance of the 18 April flood is not only its size. Based on observed stream levels at the original Pinehaven Stream gauge site, the event is estimated to have been about a 1-in-15 to 1-in-20-year flood. More importantly, the flood revealed a pattern of physical damage that has now appeared repeatedly in Pinehaven and Silverstream: fast runoff from the hills, dirty water, gravel, rocks, sediment, woody debris, blocked culverts, scoured stream banks, debris dams, and landslide risk.

This report documents several serious warning signs. Near 108A Wyndham Road, a road culvert was blocked by gravel, rocks, wood and sediment, causing silt-laden water to overtop and run down Wyndham Road. At 125 Pinehaven Road, the stream channel and driveway culvert had already been filled with gravel, rocks and debris during the 16 February flood. About 30 m^3 of material was later removed at the owners' cost, yet the culvert overtopped again on 18 April. In the upper Pinehaven Stream valley, a large debris dam formed or enlarged during the February and April storms, raising the stream bed by about 1.6 metres and leaving a large volume of sediment, gravel, rocks and debris upstream of a pipe intake. Above Silverstream homes, a landslide occurred on recently harvested GTC hillside land during the February storm.

This report does not claim that recent GTC forestry clearance is the only possible cause of every observed problem. But the location of the clearances, the downhill flow paths, the type of material being mobilised, and the timing of the February and April 2026 events are consistent with a known hazard pathway: forestry clearance and disturbed hillside land can increase runoff, scour stream beds and banks, mobilise sediment, gravel, slash and debris, block culverts and pipe intakes, and increase flooding and landslide risk downstream.

That hazard pathway was already known. Pinehaven's 1976 flood history included forestry slash, debris dams, erosion, sediment movement and landslides after GTC harvesting on the hills above the community. Save Our Hills raised this risk with Upper Hutt City Council in 2018, asking for special controls for forestry activity on steep land above urban areas. Independent flood expert Bob Hall later warned that increased runoff in steep catchments can cause stream-bed incision, bank erosion, sediment loading, aggradation, blocked culverts and debris-dam risk. The February and April 2026 events show those warnings were not theoretical.

The 18 April flood also provides another real-world test of Greater Wellington Regional Council's Pinehaven flood model and flood maps. GWRC's 1-in-10-year flood map shows Pinehaven Reserve and many surrounding properties as flooded. Yet Pinehaven Reserve did not flood on 18 April 2026, just as it did not flood during the 8 December 2019 and 16 February 2026 events. This is now the third observed flood event larger than a 1-in-10-year flood in which the official mapped flooding did not occur in key areas. The evidence indicates that the official flood model and flood maps substantially overstate present-day flooding.

That matters because the model is not merely a warning map. It is the baseline against which future development effects may be assessed. If the baseline already exaggerates existing flooding and runoff, then future development can appear to add little or no extra effect. In that way, an inflated baseline can hide the true impact of development.

This is especially serious for GTC's proposed "Silverstream Forest" development on the hills above Pinehaven and Silverstream. Hydraulic neutrality depends on a reliable baseline. A developer should have to show that post-development runoff will be no greater, no faster and no more damaging than runoff from the true existing catchment. But if the "existing" baseline already treats the forested hills as if they behave more like developed land, or treats upper stream channels as if they are already clogged, then the comparison becomes unsafe. The model has already built the future damage into the present baseline.

That is the central issue in this report. The danger is not simply that the flood maps are too large. The deeper danger is that an inflated baseline may allow large volumes of future development runoff, sediment and debris risk to be treated as "neutral" because the model assumes those effects already exist. If that happens, Pinehaven and Silverstream could be left exposed to greater flooding, erosion, blocked culverts, debris movement and landslide risk while the modelling says there is no significant increase.

The response must be urgent and independent. The debris dam in the upper Pinehaven Stream valley must be properly removed and the affected pipe intake and debris-trap structures assessed. Known local drainage failures, including the 108A Wyndham Road culvert, the 122 Pinehaven Road culvert and the isolated Jocelyn Crescent road sumps, need practical attention. GTC must be required to manage runoff, sediment, slash and debris from recently harvested land. Most importantly, the Pinehaven hydrology and hydraulic model must be independently reviewed, recalibrated against the 2019, February 2026 and April 2026 flood observations, and rebuilt with a correct existing baseline before any reliance is placed on it for GTC's fast-track development, future streamworks, LIM information or planning decisions.

The warning signs are already here. They should not be dismissed as isolated private-property drainage problems. They are evidence of a connected catchment-scale hazard above residential communities. Unless the baseline model is fixed and the hillside runoff, sediment, debris and landslide risks are properly investigated, the present warning signs may become the future reality.

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Illustrations

1. Observed Runoff Below GTC Forestry Clearance

This chapter focuses on impacts during intense rainfall in December 2019, February 2026 and April 2026 at locations downstream of Guildford Timber Company (GTC) forestry clearance. Intense rainfall has caused surface flooding, blocked drains, overtopped culverts and debris movement across parts of Pinehaven and Silverstream. The evidence does not prove that the cleared hillsides were the only cause, but the location of the clearances, the downhill runoff pathways, and the type of sediment, gravel, rocks, wood and debris are consistent with runoff from cleared hillside areas contributing to blocked drainage and worsening local flooding.

1.1 Blocked Culvert near 108A Wyndham Road

On the morning of Saturday 18 April 2026, rainfall started to become heavy at around 8:00am.

Rainwater flowed down Wyndham Road (on the right in Figure 1 opposite) and ran into Jocelyn Crescent, seen as sheet flow rippling down Jocelyn Crescent in this photo (left).

Note that at this stage the surface water is clear.

Figure 1 Jocelyn Crescent - Wyndham Road intersection

Higher up on Wyndham Road, water runs out of the road gutter and drops into a small stream (Figure 2) near 108A Wyndham Road. The stream runs into a drain under the road. Steel grating protects the intake (

Figure *3*). The drain discharges to an open channel on private land on the other side of the road.

Figure 2 Wyndham Rd, water flowing to culvert

Figure 3 Culvert intake by 108A Wyndham Rd

On the morning of 18 April 2026, the drain intake near 108A Wyndham Road became blocked, causing sediment-laden water to overtop onto the road.

Figure 4 Overtopped culvert near 108A Wyndham Road, 18 April 2026, 9:49am

Figure 5 Wyndham Rd culvert blocked, 9:49am

Efforts were made to clear the culvert intake (Figure 5) but it was not possible until after the storm had passed. The intake was buried under rocks, gravel, wood and other debris (Figure 6). Where did this material come from?

Figure 6 Gravel, rocks cleared from culvert

Figure 7 Runoff pathway from recently cleared hillside areas upstream of the blocked culvert near 108A Wyndham Road

Forest clearance on steep hillsides can increase the speed and volume of stormwater runoff. During intense rain, runoff can mobilise exposed soil, gravel, forestry slash and eroded stream-bank material, carrying it into stream channels and culverts.

The culvert near 108A Wyndham Road was blocked by gravel, rocks, wood, debris and sediment. This does not prove that the recently cleared hillside was the only source of the blockage. However, the location of the forest clearance, the downhill runoff pathways, and the type of material found at the culvert are consistent with that explanation.

This is a plausible explanation for why sediment-laden water overtopped the culvert near 108A Wyndham Road on 18 April 2026.

1.2 Clogged Channel at 125 Pinehaven Road

Flooding at 125 Pinehaven Road on 18 April 2026 (Figure 8) was a repeat of flooding that occurred at the same property two months earlier, on 16 February 2026 (Figure 9).

Figure 8 Blocked driveway culvert at 125 Pinehaven Road, 18 April 2026, 10:05am

Figure 9 Flooding of driveway at 125 Pinehaven Road, 16 February 2026, 11:37am

Figure 10 shows peak flow at 125 Pinehaven Road on 18 April 2026. At that time, floodwater was flowing across the full width of Pinehaven Road. The driveway culvert overtopped.

Figure 10 Flooding fully across roadway and in driveway at 125 Pinehaven Road on 18 April 2026

After the 16 February flood, the owners removed a large quantity of gravel, rocks and debris from the stream channel. Figure 11 shows part of that material piled beside the driveway. The owners said this was only about half of the material removed; the remainder was used to reinstate land behind the garage that was scoured away by the floodwater.

Figure 11 Gravel and debris from 16 February 2026 flood

Figure 12 Contractor removed about 30m^3 of gravel and debris from the stream channel at 125 Pinehaven Rd

Figure 13 Some of the gravel, rocks and debris removed from the stream channel at 125 Pinehaven Road

Figure 14 Photograph looking upstream at driveway culvert intake, 125 Pinehaven Road (Photo: 8 May 2026)

The owners said that during the 16 February 2026 flood, the driveway culvert and the stream channel shown in Figure 14 were completely filled with rocks, gravel, debris and sediment.

Upper Hutt City Council referred them to Greater Wellington and private contractors. Greater Wellington did not assist, saying the problem was on private property. The owners then engaged a private contractor who removed approximately **30 m^3** of gravel, rocks and debris from the channel. The work took six hours and cost the owners **$1,150**. Insurance did not cover this work.

The clogged channel on 16 February diverted a torrent of water over the driveway and through the garage (Figure 9). The owner said the water reached 18 inches / 450mm deep in the garage. The floodwater damaged the car, which was written off and covered by insurance. Some tools and other equipment were also damaged.

A similar problem occurred again on 18 April 2026, when the driveway culvert was again unable to convey the flood flow and water overtopped the driveway (Figure 8).

The owners have lived at 125 Pinehaven Road for 21 years. They said they had never seen debris clog the channel or culvert before on their property, including during the December 2019 storm. The February and April 2026 events were the first time this had occurred.

The owners suspect the sudden appearance of large volumes of gravel, rocks and debris may be related to forestry clearance on the hills upstream. This warrants investigation because of the potential connection between hillside disturbance, sediment/debris mobilisation, blocked channels and increased flood damage downstream.

---------- Forwarded message ---------
From: **Peri Zee** <peri.zee@uhcc.govt.nz>
Date: Tue, 24 Feb 2026 at 5:08 PM
Subject: Follow up - property flooding
To: fionastrongmc@gmail.com <fionastrongmc@gmail.com>
Cc: Tim Harty <tim.harty@uhcc.govt.nz>, Ros Connelly <ros.connelly@gw.govt.nz>, Jack Mace <jack.mace@gw.govt.nz>

Kia ora Fiona,

I'm reaching out after our interaction on Facebook regarding flooding at your property last Monday. I hope you are recovering well from the ordeal, I'm sure it would have been very stressful.

In response to your question around responsibilities with the management of the Pinehaven flood management I've sought clarification from Greater Wellington Regional Council. They have confirmed what our officers said during the welfare visit – that culverts on your property are to be privately managed. They have provided the following response:

> "GW and UHCC have a shared responsibility for maintaining flow through the main channel of the Pinehaven Stream where this forms part of the managed reach (with GW being responsible for the reach downstream of Pinehaven Reserve). Outside of the managed reach, private landowners are responsible for the drainage of stormwater from their property e.g. via stream channels, culverts or overland flow on their land, and for the maintenance and clearance of such drainage.
>
> GW operates a small Isolated Works fund that can partially subsidise works outside of managed reaches, where these works provide a community benefit (e.g. protecting community infrastructure or multiple private properties)."

The fund mentioned would be for any future works to prevent future flooding – and does not apply to recovering private costs from repair works following floods.

Furthermore, in answer to your question about the management of forestry slash - GWRC regulatory team have a role in checking forestry companies' compliance with the National Policy Statement for Commercial Forestry. They do proactively visit logging sites but can also respond to alleged breaches. Potential breaches can be reported through their hotline on 0800 496 734 and will be investigated.

Thanks,

Peri Zee

Mayor | Koromatua

Te Kaunihera o
Te Awa Kairangi ki Uta
Upper Hutt City Council

Figure 15 Email from UHCC Mayor Peri Zee to Fiona McIntosh, 24 February 2026

Mayor Peri Zee's email to the owners of 125 Pinehaven Road (Figure 15) treated the clogged stream channel and culvert as a private-property drainage issue and referred forestry-slash concerns separately to GWRC compliance. It does not address the wider catchment issue of increased runoff, stream-channel scour, gravel, rocks, sediment and woody debris moving downstream from recently cleared forestry areas.

1.3 Debris Dam in the Upper Pinehaven Stream Valley

A residential property near the upper end of Pinehaven Road sits immediately downstream of the intake of a piped section of Pinehaven Stream. The pipe carries runoff and flow from forestry land in the upper Pinehaven Stream valley down to the open channel near the cul-de-sac at the end of Pinehaven Road. A small debris trap is located a short distance upstream of the pipe intake. A larger debris trap is located a little further upstream.

The residents report two serious changes during the February and April 2026 storms. First, stormwater flowed down the hillside from recently cleared forestry areas above the property and flooded the back yard. The current owners have lived at the property for 17 years and say this had never happened before. A previous owner, who lived there for 21 years, also said the back yard had not flooded while they lived there.

Second, and more concerning, a large debris dam started forming at the larger debris trap during the February 2026 storm and was substantially enlarged during the 18 April 2026 storm. Gravel, rocks, sediment and debris filled the stream channel upstream of the trap, raising the stream bed by about 1.6 metres. The deposited material appears to extend across the full channel width of about 4–5 metres and for approximately 20–30 metres upstream of the trap. The debris dam may contain in the order of 150–200 m^3 of material. This is an approximate field estimate only, because the depth and width of the deposited material are not uniform.

The strength and integrity of the steelwork in the debris trap is unknown. The residents are concerned that during the next storm additional scoured and eroded material from upstream could either wash over the top of the debris trap, or place pressure on the trap itself. If further sediment, gravel, rocks and debris are mobilised in the next heavy rainfall event, there is a credible risk that the debris trap and pipe intake could be overwhelmed. This could cause rapid blockage and overtopping, sending sediment-laden floodwater through the property and potentially into the house:

> *A big downpour will cause water to pour over the catcher and flow quicker into the pipe, likely carrying more gravel and debris with it. As the pipe at the top of our garden was at 100% capacity on 18 April, during the rainfall event that filled the debris trap, I believe this situation now equals significantly increased flooding risk at our house and downstream during future heavy rain events. [Comment by affected resident]*

The owners contacted the Upper Hutt City Council on Monday 20 April. UHCC referred the matter to Wellington Water Ltd who visited the property on Wednesday 22 April.

The owners received a text message from Wellington Water Ltd on Wednesday 29 April stating that the “fault” had been “investigated / repaired” and that if the owners wanted any further information they were to contact UHCC.

It is not clear from this message what Wellington Water considered to have been “repaired”, whether the structural condition of the debris trap had been assessed, or whether the pipe intake capacity had been checked against the new volume of upstream debris.

Figure 16 Approximate location of debris dam in upper Pinehaven Stream valley

Flooding in the back yard

Water ran down the hillside from cleared forestry areas and flooded the back yard during the February and April 2026 storms at the affected property, something that hadn't occurred before.

Figure 17 Flooding in the back yard, 18 April 2026

Photo: Affected resident

The owner of the affected property followed the gushing water up the hillside to see where it was coming from.

Figure 18 "We've never had this before", 16 February 2026. Photos: Affected resident

Affected resident, 16 February 2026: "We've never had this before... Huge amounts of water coming down the gully from the forestry clearing up top. ... So this is just coming down from the forestry, and we've never had water coming down like this before ... one long stream coming down the hill."

The Debris Dam

Just beyond the affected property's back yard is the intake of a pipe that runs down to the open channel near the cul-de-sac at the end of Pinehaven Road. A little upstream from the pipe is a small debris trap (Figure 19), and a little further again upstream is a larger debris trap (Figure 20). "The debris traps and pipe here were pretty bad during the February storm, then higher flow and more gravel came down and filled the larger trap on 18 April" (affected resident).

Figure 19 The intake pipe (left, view downstream) and a small debris trap (right, view upstream)

Figure 20 Upstream is a larger debris trap (both views looking upstream). *Photos: FloodingUs NZ Ltd*

Figure 21 The debris dam began forming in February and then was substantially enlarged on 18 April, 2026

Photo: Affected resident

Figure 22 A debris dam 18 April 2026 raised the stream bed 1.6m. Photo: Flooding Us NZ Ltd

The debris traps and pipe were already under pressure during the 16 February 2026 storm. The larger debris trap appears to have trapped some material during that event. However, the more serious debris dam formed, or was substantially enlarged, during the 18 April 2026 storm, when gravel, rocks, sediment and debris filled the stream channel upstream of the larger trap.

Figure 23 The debris dam - many tonnes of sediment, gravel, rocks and debris

Photos: Flooding Us NZ Ltd

The affected resident commented that:

> *"the most significant erosion (scouring of bank, new gravel and debris, fallen trees) occurred in the 18 April event. My teenager goes exploring upstream regularly with our dog and has noticed significant changes after that rainfall event."*

Figure 24 Bank erosion upstream of the debris dam. Photos: Flooding Us NZ Ltd

Figure 25 Stream bank erosion and debris

Photo: Flooding Us NZ Ltd

Figure 26 More examples of bank erosion upstream from the debris dam

Photos: Flooding Us NZ Ltd

Figure 27 Another example of severe bank erosion

Photo: Flooding Us NZ Ltd

Figure 28 Scouring of the stream banks and bed. Photos: Flooding Us NZ Ltd

The affected resident commented further that:

"the streambed had some changes higher up after 16 Feb, with gravel filling one of the deep holes and a few changes in the meandering - but we noticed after 18 April that much more change had occurred, especially in the lower reaches near our house - the streambed is higher and wider, corners have been carved off, lots of gravel and debris, trees are down and fallen into the stream. My concern is that this progressive loss of complexity in the streambed has turned it into a chute, delivering water and debris faster downhill into Pinehaven during high rainfall ... it's sad to see this happen to Pinehaven Stream."

Figure 29 Much loose material in the stream bed, from scouring and erosion?

Photos: Flooding Us NZ Ltd

Figure 30 An example of eroded logging cuttings on the GTC hillside

Photo: Flooding Us NZ Ltd

Figure 31 Water channels in old GTC logging tracks.

Photo: Flooding Us NZ Ltd

Figure 32 View from below - forest clearance above Pinehaven Road. Photo: Flooding Us NZ Ltd

Figure 33 View from above - looking down towards Pinehaven Reserve. Photo: Flooding Us NZ Ltd

Figure 34 Cracks in GTC ground after forest clearance

Photos: Flooding Us NZ Ltd

"Homeowners living on or near slopes are encouraged to be alert to early warning signs of instability, such as cracks in the ground … or changes after heavy rainfall."

Source: *"Landslides result in more claims than any other natural hazard" — RNZ, 13 May 2026*

Flooding Us NZ Ltd has concerns about what might happen during the next storm if heavy rain and runoff cause more erosion and scouring and there is no longer any effective debris trap capable of holding back the sediment, gravel and debris.

Figure 35 Drainpipe filled to capacity during the storm on 18 April 2026, 9.38am.

This photo (left) is a screenshot of the drainpipe at 100% capacity, taken from a video by the affected resident during the heavy rainfall event on Saturday morning, 18 April, 2026.

Figure 35 shows the pipe running at full capacity during the 18 April 2026 storm. Flooding Us NZ Ltd believes this is significant because the same storm also deposited a large volume of gravel, rocks, sediment and debris in a dam at the larger debris trap. If that debris trap remains full or compromised, the next heavy rainfall event could send additional material downstream toward a pipe system that would not be able to cope with more flow.

The concern is therefore not hypothetical. The February and April storms have already shown new hillside runoff, new backyard flooding, substantial stream-bank erosion, large volumes of mobilised material, and a pipe intake operating at full capacity.

The immediate question is whether the debris dam will be properly removed, whether the debris-trap structure has been assessed, and whether the downstream pipe can safely convey future flows if further sediment and debris are mobilised from the cleared hillside.

1.4 Slip above 136A Pinehaven Road: Forestry Risk and Missing Safeguards

During a storm on 8 December 2019, a slip on the edge of forestry harvesting sent debris through 136A Pinehaven Road, highlighting risks from forestry, seen in disasters at Tolaga Bay (2020) and Gisborne (Cyclone Gabrielle, 2023).

There are still no effective safeguards for the public from Pinehaven forestry in:

- GWRC's Pinehaven Flood Management Plan (FMP), 2016
- UHCC's District Plan Change 42, 2019, or
- National Environmental Standard for Commercial Forestry (NES-CF)

Local and central government must implement enforceable rules to ensure runoff, sediment, slash and debris from forestry activity on GTC land are properly managed, so downstream communities are protected. This is not optional. It is essential to prevent property damage from forestry activity like in the 1976 flood.

Figure 36 Slip on edge of forestry harvesting, 8 December 2019 (Photo: Janis Martins)

"A huge deluge of water ... carrying tons of silt and stones.... causing an immense amount of damage to our properties ... The drive was full of mud, stones and silt, well over nine inches deep in places ... I started to get quotes for its removal. ... We estimate 26 tons of earth ended up on our land and our neighbours from one event. In total we paid just under $4000 to deal with this event.... My partner and neighbour trekked back up the hill, tracking up the stream to the ridge, and remain convinced after viewing the slip that it originated at the top, by the logging area."   Owner at 136A Pinehaven Road

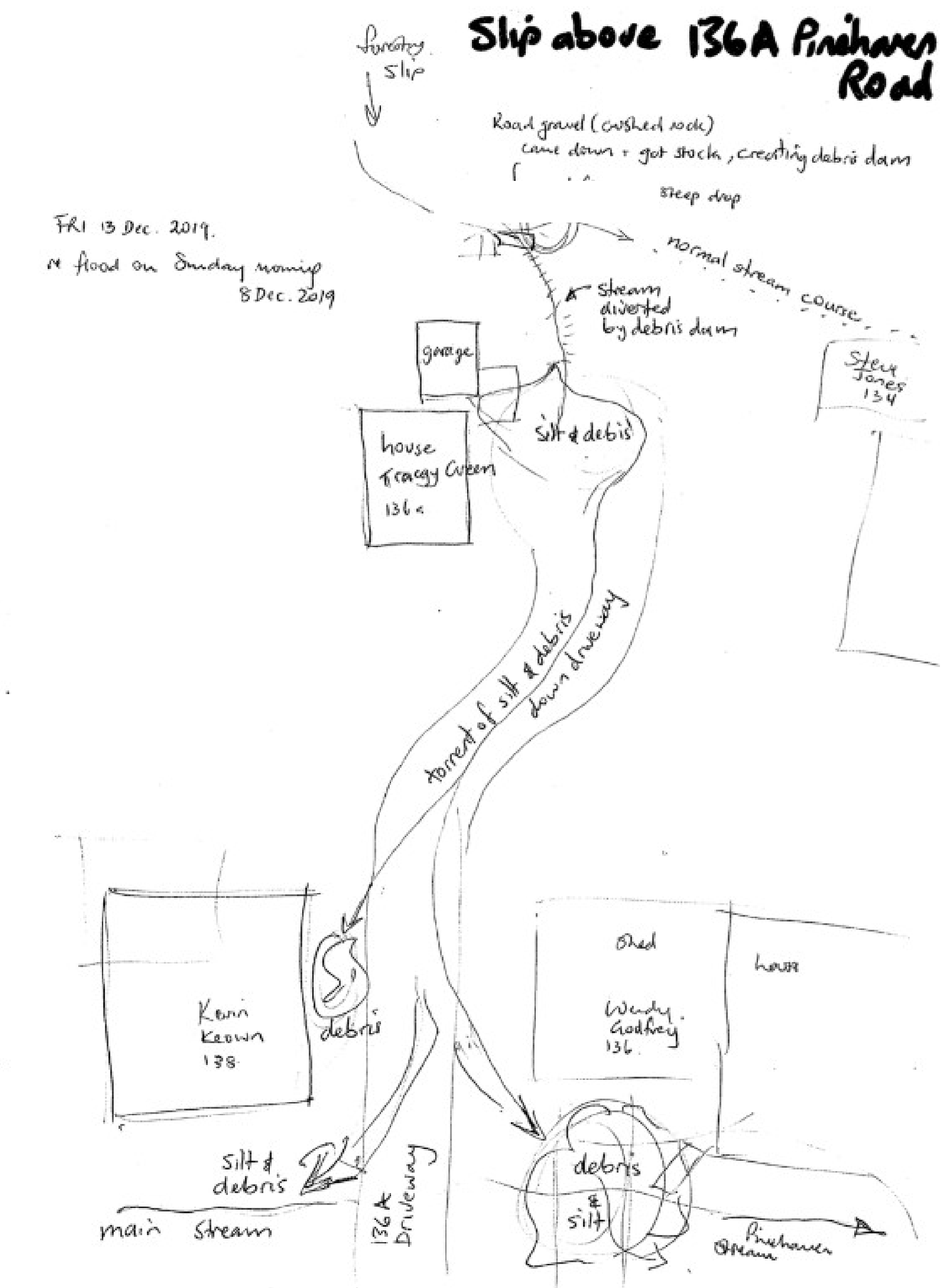


Figure 37 Sketch (by nearby neighbours) of the slip at 136A Pinehaven Road

This was reported by the owner to GWRC. The following is the affected owner's account and opinion. This report does not make a final finding on legal responsibility for the 2019 slip, but the account shows why residents remain concerned about forestry-related runoff, slips and debris from the hills above Pinehaven: "*We again contacted GWRC. They again investigated and denied Guildford's were involved. We are at an impasse. And Guildford Timber Company has again closed the hills for logging. We need to make our council reconsider its actions as regards to flood works and building consents. This could happen to you.*"

1.5 Landslide on Recently Harvested GTC Hillside above Silverstream Homes

Figure 38 Landslide on harvested hillside, 16 February 2026. Photo: Flooding Us NZ Ltd

The landslide shown above (Figure 38) occurred during the storm on Monday 16 February 2026, on steep GTC land above homes in Silverstream where pine forest had recently been harvested.

The slip occurred on the edge of a forestry road cutting (Figure 40). The gully in which it occurred drains down toward the stormwater pipe intake in the small public reserve between Pioneer Grove, Sorrento Way and Kurth Crescent.

This matters because landslides, erosion and sediment movement on steep harvested hillsides do not stay on the hillside. During heavy rain, eroded soil, gravel, rocks and woody debris can be washed down gullies and into stormwater networks, reducing pipe capacity and increasing blockage and flooding risk downstream.

Independent flood expert Bob Hall has warned that increased runoff in steep catchments can cause stream-bed scour, bank erosion, increased sediment loading, aggradation of stream beds and blocking of culvert entries. The February 2026 Silverstream landslide is an example of exactly the kind of hillside instability and downstream stormwater risk that Bob Hall and residents have been warning about.

The Google map below shows the approximate location of the landslide. Before harvesting, this area was in pine forest. The photographs that follow show the exposed landslide scar, loose eroded material and the steepness of the land above existing Silverstream housing.

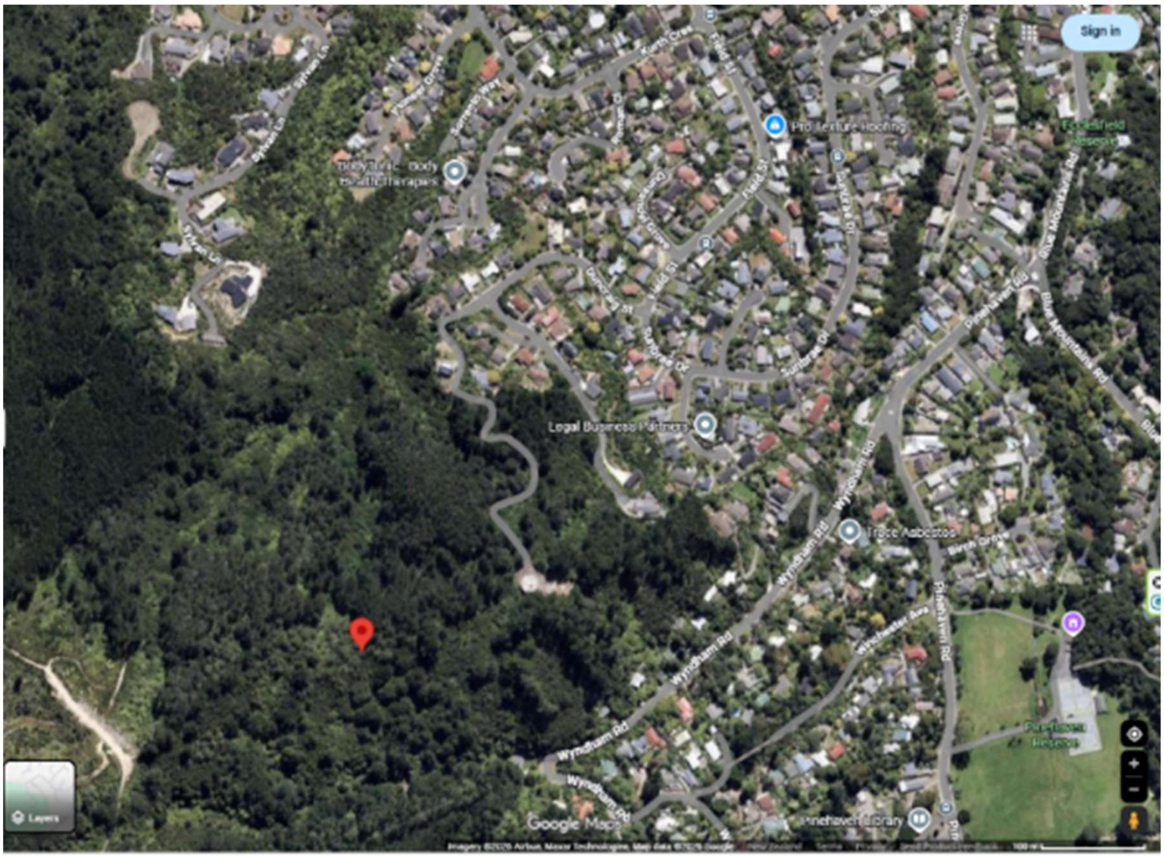


Figure 39 Google map showing approximate location of landslide (by Dennis Clark)

The Google map above (Figure 39) shows that the landslide location was previously in pine forest before harvesting. The slip occurred on the edge of a forestry road cutting (Figure 40).

Figure 40 Landslide occurred on edge of GTC logging track (Photo: Dennis Clark)

Figure 41 Landslide on steep GTC hills above housing in Silverstream (Photo: Dennis Clark)

"... steep hillsides, heavy rainfall, and unmanaged surface water can combine to produce sudden ... slope failures. ... hydrological processes are closely connected to landslide risk. Increased stormwater runoff from large-scale development on steep, forested hillsides can alter soil moisture, groundwater levels, and surface flow paths. Where runoff is not properly managed, these changes can increase the likelihood of slope instability, erosion, and landslides, particularly during extreme rainfall events." [Flooding Us, Rev 3, p12]

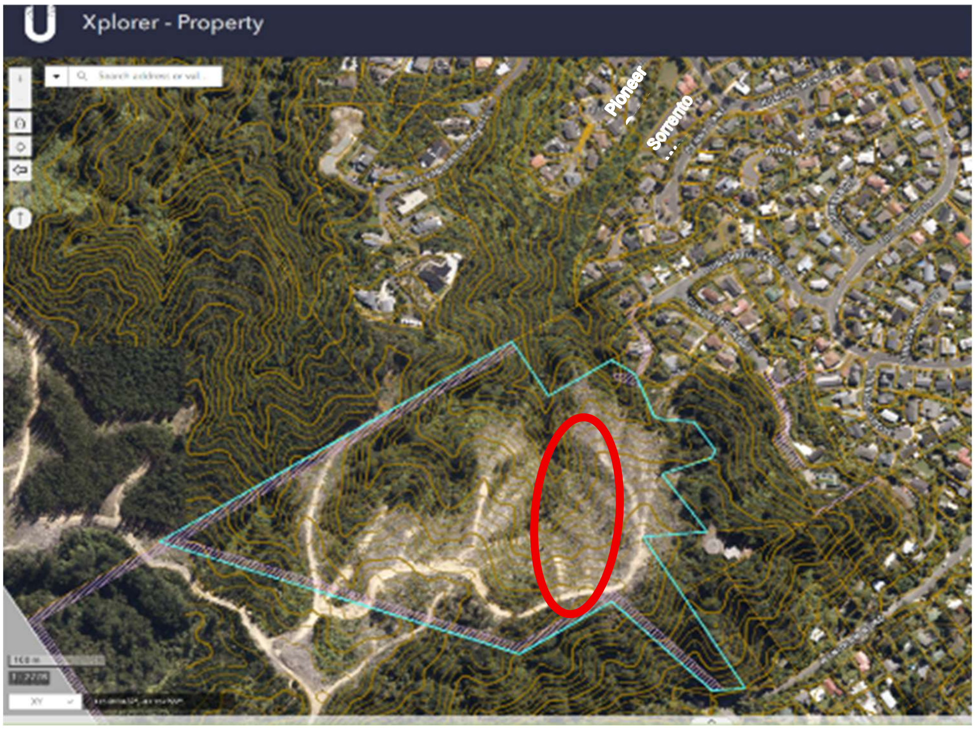


Figure 42 Approximate location (red ellipse) of landslide on 16 February 2026

There is evidence of gravel, sediment and debris reaching the stormwater intake (Figure 43) below that gully in a reserve between Pioneer Grove and Sorrento Way. That matters because this is the same hazard pathway: hillside disturbance and erosion above residential areas, followed by material moving down gullies and into public stormwater infrastructure.

Figure 43 Pioneer Grove culvert, 20 Feb 2026, after storm 16 Feb 2026. *Photos: Flooding Us NZ Ltd*

Based on information released publicly by GTC in 2007, 2016 and 2023, it is GTC's intention to develop in the vicinity of the Feb 2026 landslide with medium-density housing (Figure 44 below).

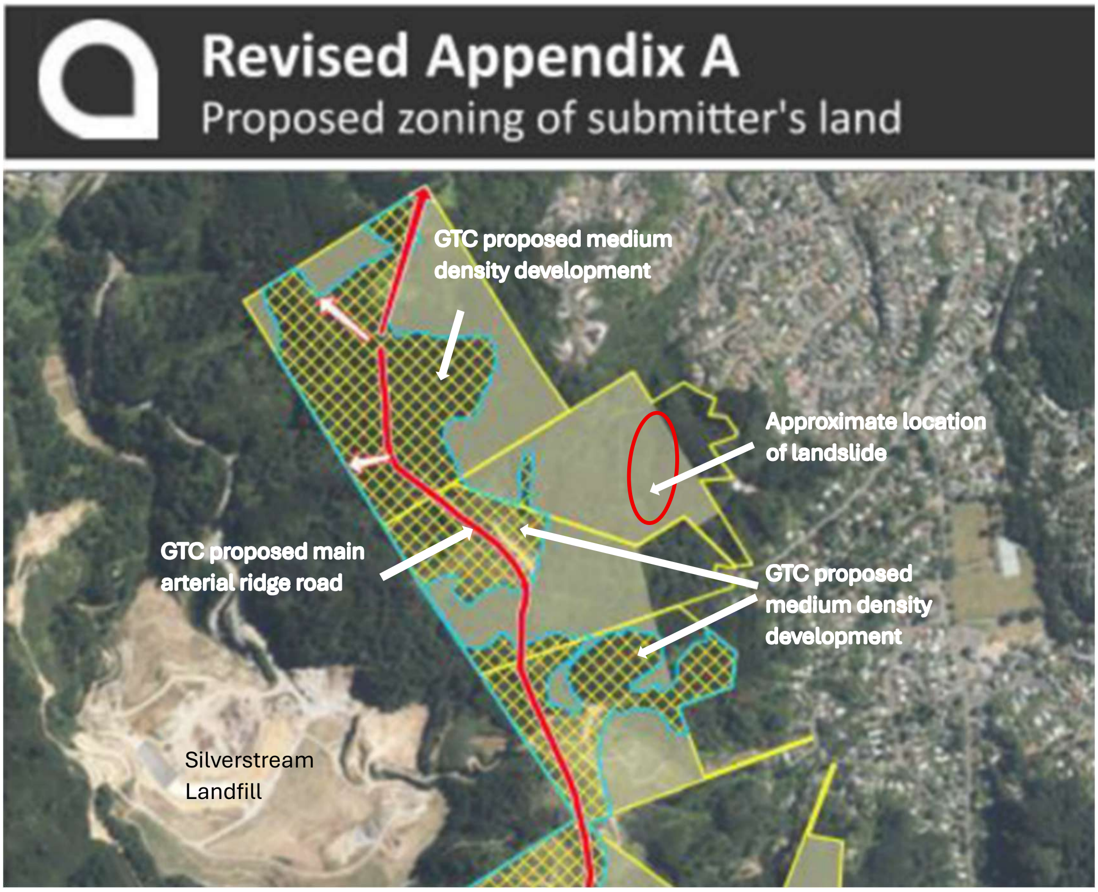


Figure 44 Our notes added to GTC PC50 Submission, Appendix A, Nov 2023 to UHCC

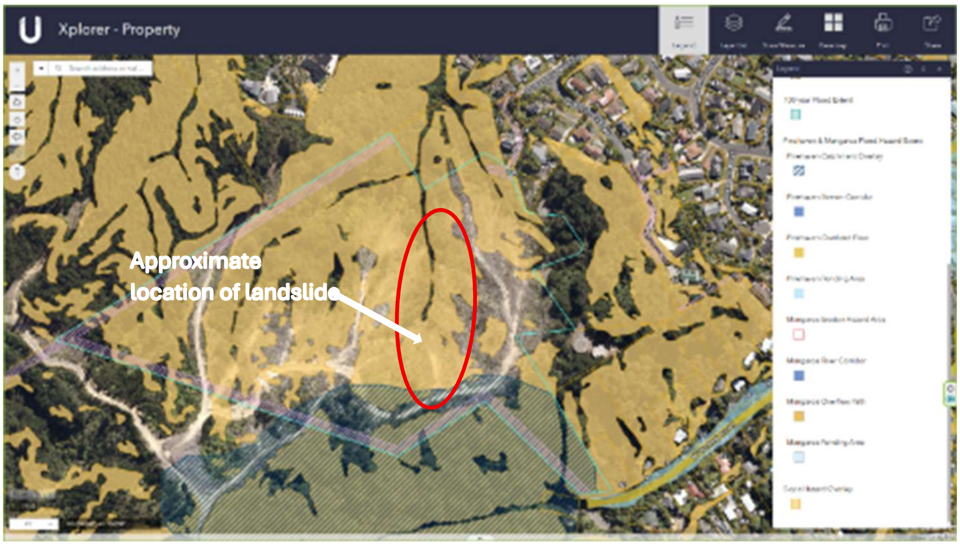


Figure 45 UHCC Slope Hazard Overlay (brown shading)

Most of GTC's site on which the landslide occurred is within the known 'slope hazard' overlay (Figure 45) due to the steepness of the land. Part of GTC's site below the landslide is zoned 'General Residential', with apparent access for residential development on GTC's site from the top end of Duncraig Street.

The combination of land-use change (whether forestry harvesting or development) plus steep unstable land plus heavy rainfall can be lethal, as the recent tragic events in the Bay of Plenty have shown.

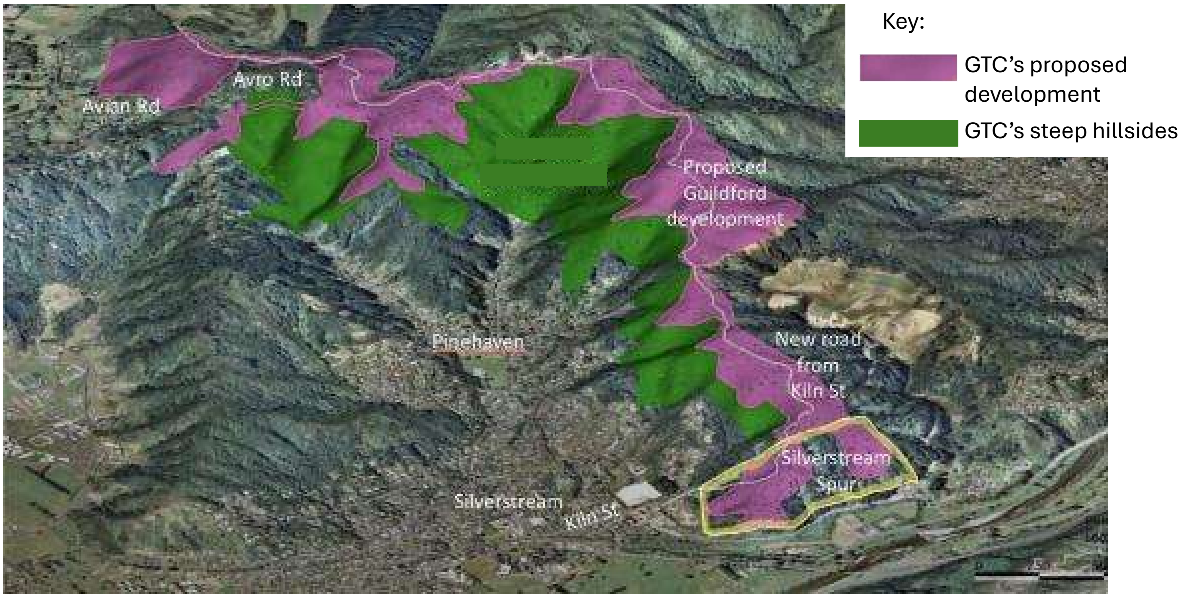


Figure 46 Indication of the scale of GTC's proposed development (Source: Sophie Grant)

The immediate concern is not only the landslide itself. It is the combination of steep harvested land, exposed soil, forestry roads/cuttings, heavy rainfall, loose sediment, and existing homes and stormwater infrastructure directly below. The 16 February 2026 landslide shows why forestry clearance, stormwater management and future development on these hills must be assessed as a connected downstream hazard, not as an isolated hillside event.

2. Known Forestry Runoff, Debris and Landslide Hazard

Chapter 1 identified five recent warning signs below GTC forestry clearance: the blocked culvert near 108A Wyndham Road on 18 April 2026; the clogged channel at 125 Pinehaven Road on 16 February and 18 April 2026; the debris dam in the upper Pinehaven Stream valley, which began forming on 16 February and enlarged on 18 April 2026; the slip above 136A Pinehaven Road on 8 December 2019; and the landslide above Silverstream homes on 16 February 2026.

Taken together, these events should not be dismissed as isolated drainage problems. They point to a wider hazard pathway: after forestry clearance on steep hillsides, increased runoff can scour stream beds and banks, mobilise gravel, rocks, sediment, slash and woody debris, block culverts and debris traps, and increase slip and landslide risk downstream.

This chapter explains why that hazard is already known and foreseeable. Chapter 3 then explains why the risk becomes more serious if GTC's proposed hillside development proceeds while Council continues to rely on an inflated baseline flood model that may hide the true runoff effects of future urban development.

That risk is not new or unforeseeable. During the extreme December 1976 storm, flooding and property damage in Pinehaven and Silverstream were reportedly exacerbated by slash and debris from recent GTC forestry harvesting on the hills above the community. A slash/debris dam burst during that event, releasing water, mud, timber and debris downstream. Some houses were partly buried. There were also many landslides, some of which caused severe property damage. Historic UHCC photographs from the 1976 flood show houses affected by mud, timber and forestry debris following GTC forest harvesting (Figure 47 and Figure 48).

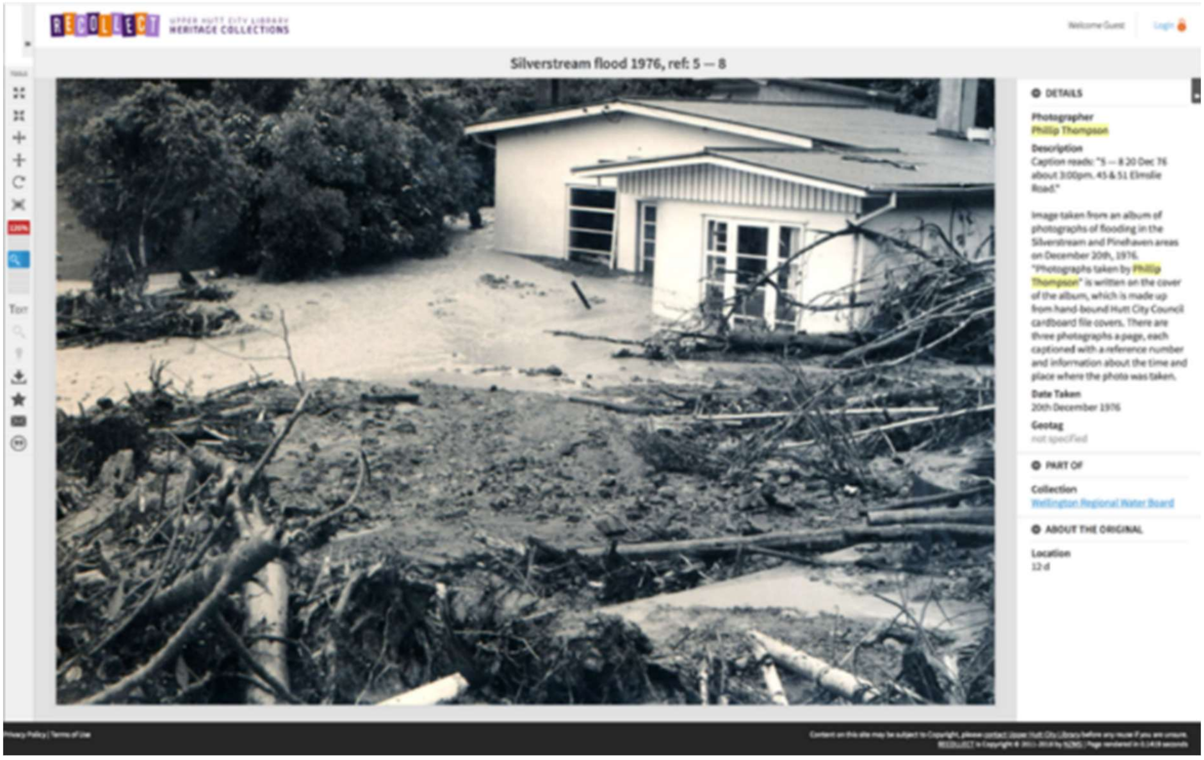


Figure 47 UHCC Library Archives: Phillip Thompson Photos – 20 December 1976 flood following GTC forest harvesting

Figure 48 UHCC Library Archives: Phillip Thompson Photos – 20 December 1976 flood following GTC forest harvesting

The recent events described in Chapter 1 show why that 1976 history remains directly relevant. The 2019 slip above 136A Pinehaven Road, the February 2026 landslide above Silverstream homes, and the February/April 2026 flooding, blocked channels and debris movement at 125 Pinehaven Road and the upper Pinehaven Stream valley all point to the same hazard pathway: steep cleared hillsides, increased runoff, erosion, sediment and debris movement, blocked culverts or pipe intakes, and damage or risk downstream. These events are not isolated surprises. They are recent examples of a known forestry-runoff, debris and landslide hazard that residents had already warned Council about in 2018.

Figure 49 Save Our Hills presentation to the UHCC Policy Committee, 20 June 2018

On 20 June 2018, Save Our Hills addressed the UHCC Policy Committee about the Long Term Plan and the recently enacted National Environmental Standard for Plantation Forestry, warning that Pinehaven needed special forestry-activity rules because GTC plantation forestry sits on very steep hills directly above urban areas. The presentation asked how Council would prevent recurrence of the 1976 forestry-related flooding, slash, erosion and debris-dam hazards.

SOH told the Committee that the UHCC District Plan had no provisions for controlling harvesting of pines on GTC land on the hills above urban areas, and that GWRC's Pinehaven Floodplain Management Plan also had no such provisions, even though Pinehaven residents had requested them.

SOH specifically reminded UHCC of the **Report on Storm of 20 December 1976** by R G Bishop for the Wellington Regional Water Board, which had stated that it would be desirable to have **"a special set of guidelines for forestry operations within the Pinehaven Catchment."** The reasons given were exactly the issues now recurring:

- an afforested area on very steep hills above an urban area,
- high-intensity rainfall,
- extensive slipping,
- soil erosion and debris,
- flooding worsened by blockages caused by slashings,
- and increased runoff and sediment loads from deforestation.

SOH asked UHCC how it would prevent this problem from recurring in Pinehaven. It requested a special study and special forestry-activity rules specific to the Pinehaven situation, with the objective of protecting residents and properties in urban areas directly downhill from GTC forestry.

That 2018 presentation is important because it shows the current problem was foreseeable. The risk was identified from the 1976 flood history, raised directly with Council, and linked to the absence of specific planning controls for GTC forestry on steep land above residential areas.

Independent expert warning about sediment, aggradation and blocked culverts

Independent flood expert Bob Hall later warned about the same physical process now being observed in Pinehaven and Silverstream: increased runoff from steep hills can change stream-channel behaviour, causing erosion upstream and sediment build-up downstream.

In his 2 December 2020 memorandum to Save Our Hills, Hall explained that increased runoff in a steep, well-vegetated catchment cannot be addressed simply by controlling peak flow. Even if detention structures reduce the peak, the greater volume of runoff still has to pass through the catchment. Hall warned that this change in flow regime can cause stream beds to incise, channels to widen, and lateral bank erosion to become more pronounced. The erosion products and destabilised riparian vegetation can then accumulate in upper reaches and be swept downstream in later storms.

This is directly relevant to the 2026 observations. Hall warned that increased sediment loading deposited in flatter downstream reaches could "quickly remove any gains from the channel upgrade", and that the combined effects could include **aggradation of stream beds and blocking of culvert entries**. He also warned that debris-dam formation and failure during major storms could have very serious consequences, including risk to human life.

This chapter does not deal in detail with Hall's wider critique of the Pinehaven baseline flood model or the failure of hydraulic neutrality. That is addressed later. The point here is that an independent expert had already warned that increased runoff from steep upper catchments can produce exactly the kind of downstream effects now being seen, namely stream-bed scour, bank erosion, sediment loading, aggradation, blocked culverts and debris-dam risk.

The later events at 136A Pinehaven Road in 2019, the Silverstream landslide in February 2026, the blocked channels and flooding at 125 Pinehaven Road and the debris dam in the upper Pinehaven Stream valley in February and April 2026 are therefore not isolated surprises. They are examples of the very hazard pathway residents had already warned Council about, and that Bob Hall had independently described: increased runoff and altered flow behaviour in steep upper catchments can scour and erode channels upstream, then deposit gravel, rocks and debris downstream where stream gradients flatten and culverts or pipe entries can block.

The concern is not simply that forestry occurs on the hills. The concern is that harvesting, earthworks, tracks, exposed soil, slash and disturbed stream channels on steep land can create hazards that are exported downhill onto people who have no control over the upstream activity.

The current forestry regulations are the Resource Management (National Environmental Standards for Commercial Forestry) Regulations 2017, commonly referred to as the **NES-CF**. These were previously the National Environmental Standards for Plantation Forestry, but the name changed in 2023. The NES-CF is intended to provide nationally consistent rules for managing the environmental effects of commercial forestry, but the practical question for Pinehaven and Silverstream is whether those rules, together with regional and district planning controls, actually protect communities immediately downstream of steep plantation forestry.

Figure 50 GTC logging offcuts and slash (2021) - this kind of debris contributed to the debris-dam that burst in the 1976 event and half-buried some houses

Large volumes of forestry slash and cut timber left on the GTC hillside following harvesting or clearance can be mobilised during intense rainfall if not properly managed. Pinehaven has already experienced this hazard. During the 1976 flood slash, blockages, soil erosion and debris were noted as factors that worsened flooding and damage. The photographs above (Figure 50) show why residents remain concerned that unmanaged slash on steep hills above Pinehaven and Silverstream could again contribute to downstream debris dams, blocked culverts, sediment movement and property damage.

So far, the evidence suggests a serious protection gap. GWRC's 2016 Pinehaven Floodplain Management Plan did not provide effective protection from forestry-related runoff, slash, debris dams, sediment and landslide risk. UHCC's Plan Change 42 inserted flood hazard extents into the District Plan but did not solve the upstream forestry hazard. The national NES-CF forestry rules may regulate forestry activities, but they do not appear to have prevented repeated downstream harm or risk in Pinehaven and Silverstream.

This is why the response to the McIntosh property at 125 Pinehaven Road is so troubling. After the 16 February 2026 flooding, Mayor Peri Zee wrote to the owners after seeking clarification from Greater Wellington Regional Council (Figure 15). The response treated the clogged channel and culvert as a private-property drainage matter, while referring forestry-slash concerns separately to GWRC's regulatory team. That separation may suit administrative boundaries, but it does not reflect how the catchment works. Water, sediment, slash, rocks and debris move downhill into residential areas as one connected system.

The downstream resident is left with the damage and the cost. The upstream forestry source is treated as a separate regulatory matter. The public stormwater system is exposed to material coming down from private forestry land. Councils then point to divided responsibilities: private landowners, Wellington Water, UHCC, GWRC flood management, GWRC regulatory compliance, and national forestry rules.

That is the accountability gap.

The December 1976 flood should have been a permanent warning. The 8 December 2019 slip above 136A Pinehaven Road should have reinforced that warning. The 16 February 2026 landslide above Silverstream should have triggered urgent attention. The February and April 2026 debris and flooding at 125 Pinehaven Road and the debris dam in the upper Pinehaven Stream valley show that the same hazard mechanism is active now.

This is not a hypothetical future problem. It is already happening.

The immediate question is whether UHCC, GWRC and central government will continue treating these events as isolated private-property drainage issues, or whether they will finally recognise the wider catchment-scale hazard: the observed evidence warrants urgent investigation into whether steep GTC forestry land and proposed future development above residential communities are contributing or will contribute to dangerous runoff, sediment, slash, debris and landslide risks downstream.

3. Serious Consequences of an Inflated Baseline Flood Model

The flooding, sediment movement, blocked culverts, debris dams, stream-bank erosion and landslides described in Chapters 1 and 2 are serious. They require practical action. Culverts need to be fixed. Isolated road sumps need to be connected to the public stormwater network. The debris dam in the upper Pinehaven Stream valley needs to be properly removed. GTC must be required to control runoff, sediment, slash and debris from recently harvested areas.

But those actions are not enough.

The most urgent issue is the Pinehaven baseline flood model. That model is the first and most important line of defence for Pinehaven and Silverstream. If the baseline model is wrong, then every later decision built on it is unsafe: flood maps, stream improvements, planning rules, LIM information, hydraulic neutrality assessments, and decisions about GTC's proposed fast-track "Silverstream Forest" development.

The danger is counter-intuitive. Inflated flood maps may simply appear to be "conservative" or "cautious". If the maps show too much flooding, then surely, people might suggest, that gives the community more flood protection, not less?

That would only be true if the maps were used only to warn people about possible flooding. But they are also being used as the baseline against which future development effects are assessed. If the baseline already exaggerates existing runoff and flooding, then future development can appear to add little or no further effect. In that way, an inflated baseline can hide the real increase in runoff from development.

That is why this chapter matters. The issue is not simply whether the flood maps are too big. The issue is whether an inflated baseline model will allow GTC to discharge large volumes of additional runoff from its proposed hillside development while still claiming "hydraulic neutrality".

Hydraulic neutrality means a new development must not make flooding worse downstream.

In simple terms:

After the development, stormwater runoff from the site should be no greater, no faster, and no more damaging than it was before the development.

For Pinehaven, that means GTC's proposed hillside development should not send extra stormwater, sediment, debris, or faster flood flows down into Pinehaven and Silverstream compared with the true pre-development forested catchment.

The 18 April 2026 flood is therefore not the main focus of this report. It is evidence. It is the third real-world warning, after 8 December 2019 and 16 February 2026, that the official flood model does not match observed flooding. It also shows the physical processes that matter most: runoff, sediment, gravel, debris, blocked culverts, stream scour and landslide risk.

The conclusion should be obvious: the baseline flood model must be independently reviewed and fixed now, before GTC's fast-track development is assessed and before further reliance on the existing flood maps or on the stream improvements design.

3.1 Real Floods Show the Model is Inflated

GWRC's 1-in-10-year flood map shows Pinehaven Reserve and about 100 homes in Pinehaven Road, Jocelyn Crescent, Forest Road and the Birch Grove area as flooded.

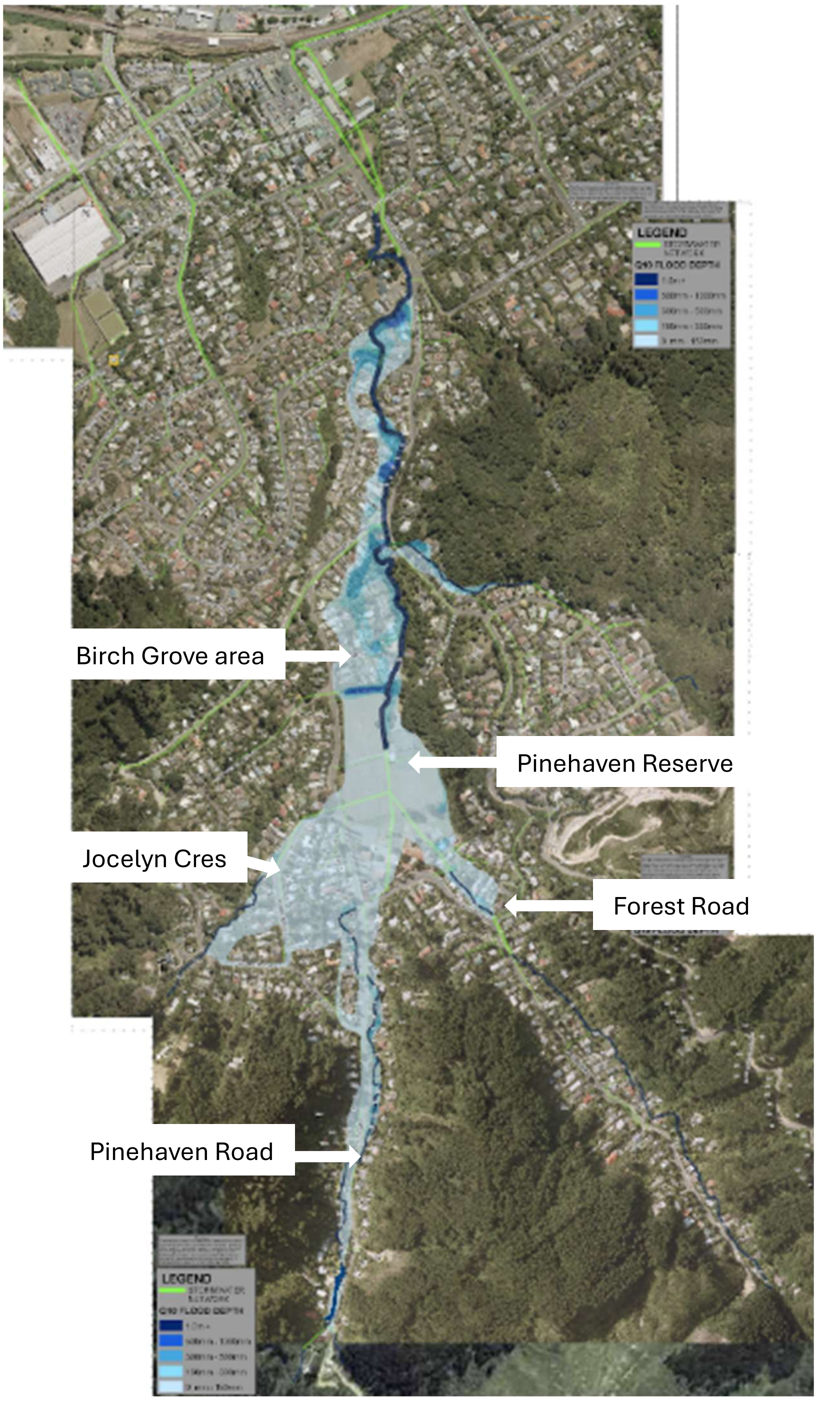


Figure 51 GWRC 1-in-10-year flood map for Pinehaven Stream, Upper Hutt

GWRC's 1-in-10-year Pinehaven flood map shows Pinehaven Reserve, Jocelyn Crescent, Forest Road, Birch Grove and Pinehaven Road as flooded.

Real flooding observed in Pinehaven on 18 April 2026 did not match this 1-in-10-year map, even though the flood on 18 April 2026 is estimated to have been larger than a 1-in-10-year flood event.

We estimate that the storm on 18 April 2026 was a 1-in-15 to 1-in-20-year flood (Ch. 5).

Pinehaven Reserve did not flood on 18 April 2026. Properties in the Birch Grove area and Forest Road did not flood. Most properties in Jocelyn Crescent did not flood, although there was some surface flooding at 37 and 39 Jocelyn Crescent.

The 18 April event is therefore important as a real-world test of the Pinehaven flood model.

The official 1-in-10-year flood map shows Pinehaven Reserve totally flooded. Photographs taken near the peak of the 18 April flood show that the mapped flooding did not occur. The reserve was wet, and the stream swelled, but the mapped flood extent did not happen.

Figure 52 Pinehaven Reserve looking north 18 April 2026 at 8:55am - not flooded

Figure 53 Pinehaven Reserve looking south 18 April 2026 at 8:55am - not flooded

Figure 54 Pinehaven Reserve picnic area 18 April 2026 at 8:55am - not flooded

Figure 55 Pinehaven Reserve 18 April 2026 at 08:50am - north end not flooded

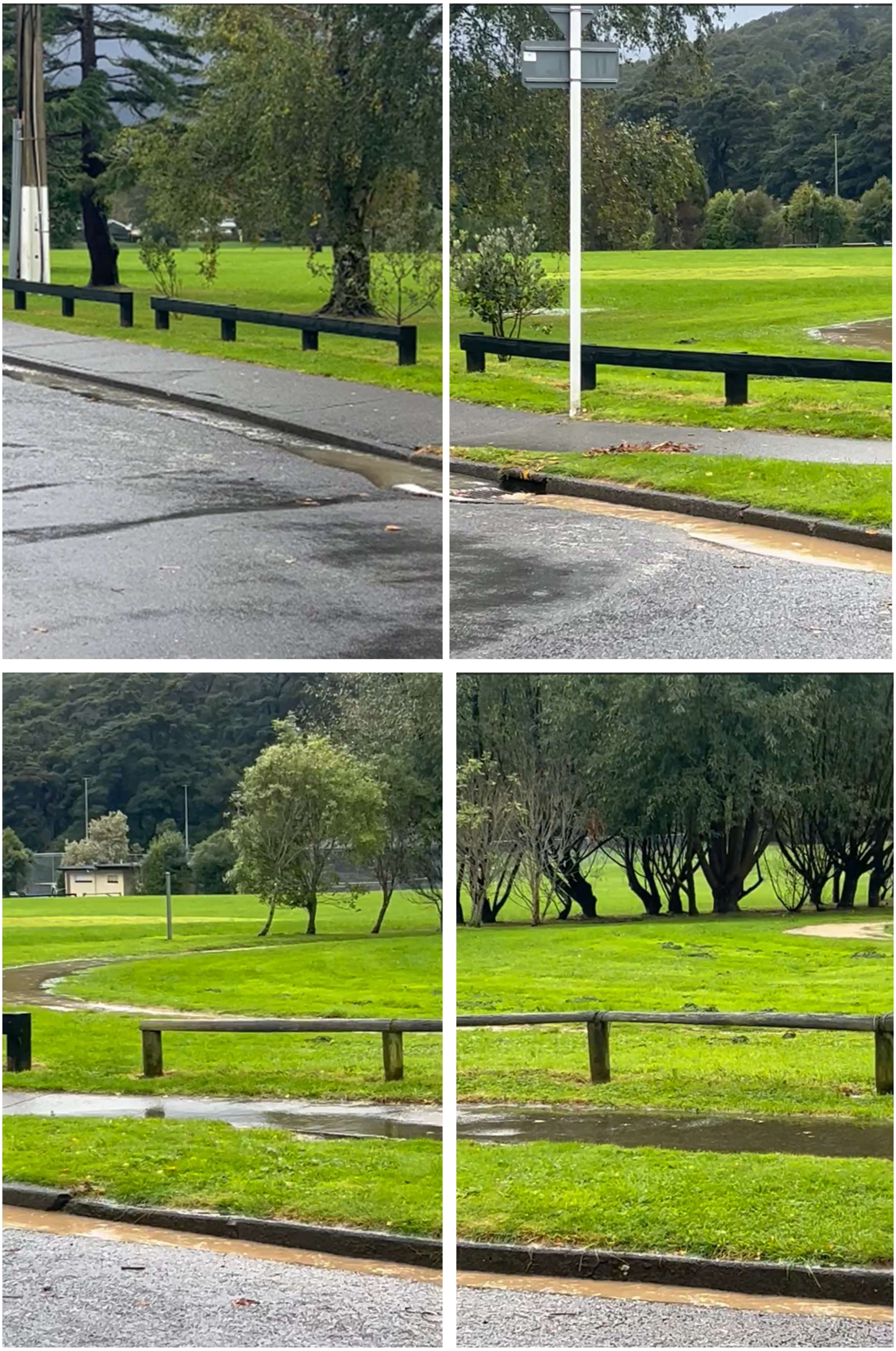


Figure 56 18-4-26 9:38am Pinehaven Reserve - not flooded

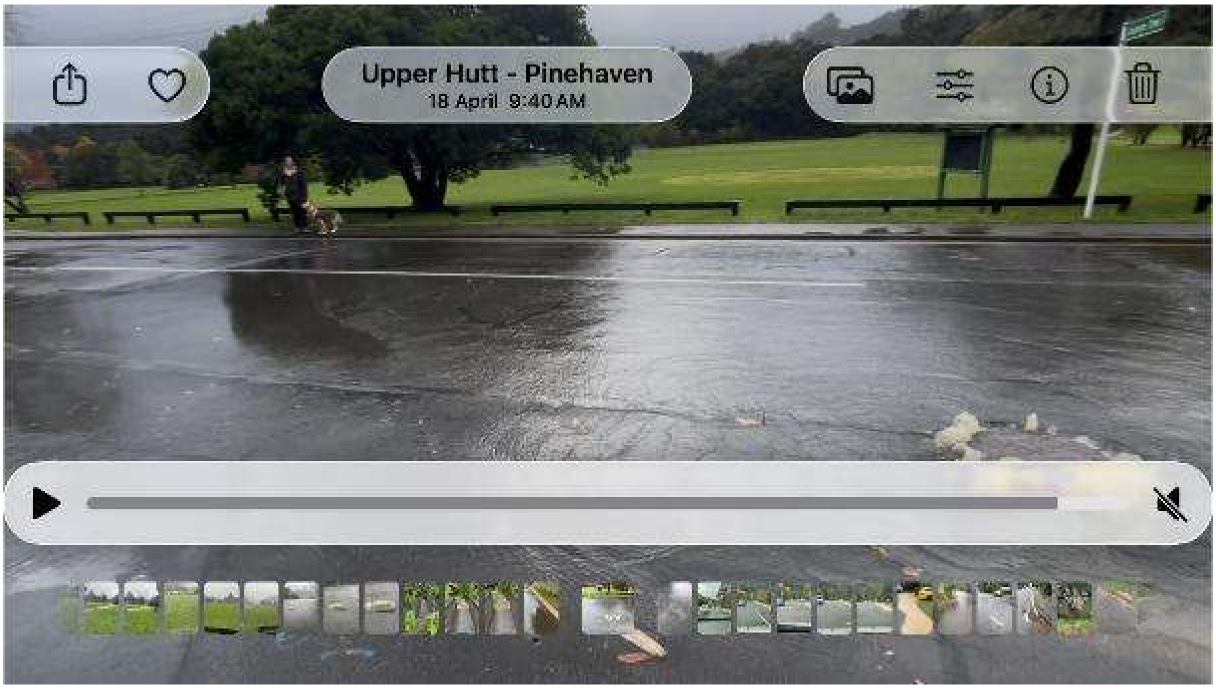


Figure 57 Pinehaven Reserve from Jocelyn Cres., 18 April 2026 at 9:40am – Reserve not flooded

Figure 58 Pinehaven Reserve, 18 April 2026 at 10:10am - water receding

Figures 52–58 above show photographs taken of Pinehaven Reserve during and shortly after the peak flow on 18 April. GWRC's 1-in-10-year flood map shows Pinehaven Reserve totally flooded. But in three flood events all larger than 1-in-10-year events (8 December 2019, 16 February 2026 and 18 April 2026) Pinehaven Reserve did not flood. All three events demonstrate that the official flood maps grossly exaggerate flooding and are unreliable.

The 18 April 2026 flood also matters because it produced exactly the kind of evidence that should make councils cautious: silt-laden water, blocked culverts, gravel and rocks in channels, debris movement, stream-bank erosion, and a debris dam in the upper Pinehaven Stream valley. Those are real risks. But they occurred while the official flood model was still showing much wider general inundation that did not happen.

That means the problem is not merely that Council's maps are "cautious". The problem is that they do not reflect real-world flood behaviour in the catchment. If a model cannot reliably reproduce known flood events, it should not be relied upon to approve major land-use change on the hills above the community.

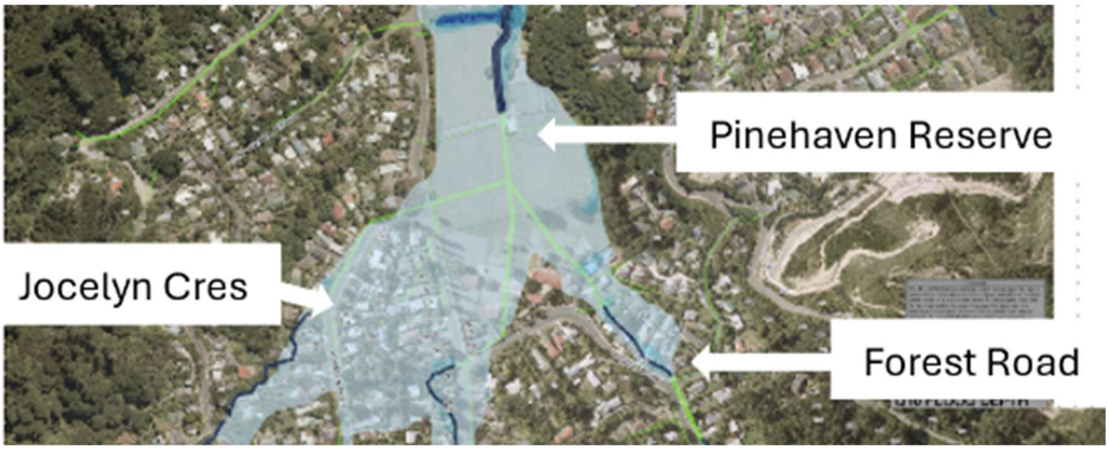


Figure 59 Close-up of GWRC 10-year flood map for Pinehaven Reserve / Jocelyn / Forest Road

In Figure 59 above, roughly 99% of the flooding shown in this part of GWRC's 1-in-10-year flood map did not occur on 18 April 2026, estimated as larger than a 1-in-10-year event.

Figure 60 Pinehaven Road and Jocelyn Crescent (north end by Library) wet, but not flooded as shown on GWRC's 1-in-10-year flood map

3.2 The Baseline Model Builds Future Damage into the Present

The most serious problem is not simply that the flood maps are too large. The deeper problem is that the baseline model appears to build future or degraded catchment conditions into the existing case.

A proper baseline flood model should represent the catchment as it actually was before major recent forestry clearance and before GTC's proposed development: forested hillsides, functioning stream channels, and real existing drainage structures. That baseline should then be compared with the future developed case.

But the Pinehaven flood model appears to do the opposite. It treats the existing forested hills as if they already generate much higher runoff from development, and it treats upper catchment stream channels as if they are already heavily obstructed or clogged.

The result is a baseline flood model that already contains the kind of damage the community is trying to prevent.

This matters because future development is assessed against the baseline. If the baseline is already inflated, then additional runoff from GTC's development can appear smaller than it really is. Hydraulic neutrality may then be claimed, not because the development is genuinely stormwater neutral, but because the baseline has already included the development effect.

3.2.1 The Hills are Treated as if Development is Already There

A reliable baseline flood model should distinguish between two very different catchments:

- the existing forested catchment, with tree canopy, vegetation, soil storage and infiltration; and
- the future developed catchment, with roads, roofs, driveways, retaining walls, compacted ground and stormwater pipes.

That difference is fundamental. Forested hills retain and absorb rainfall. Urban development sheds rainfall quickly. If the model does not correctly distinguish between those two conditions, it cannot reliably assess the true effect of development.

The core problem is that the Pinehaven baseline flood model uses rainfall-loss assumptions not for forested hills but more like for urban development. In other words, the model removed the hydrological difference between the existing forest and future urban development.

That is why SKM's 2010 "future case scenario" modelling appeared to show little or no increase in flood volume for future development. It was not a real-world finding that 1,665 houses on the hills would make little or no difference. It was the result of how the model was configured.

The problem is simple enough for the public to understand:

If you model the forest as if it already behaves like urban development, then later development will appear to add very little or no extra runoff and flooding.

That is not hydraulic neutrality. It is an unreliable baseline.

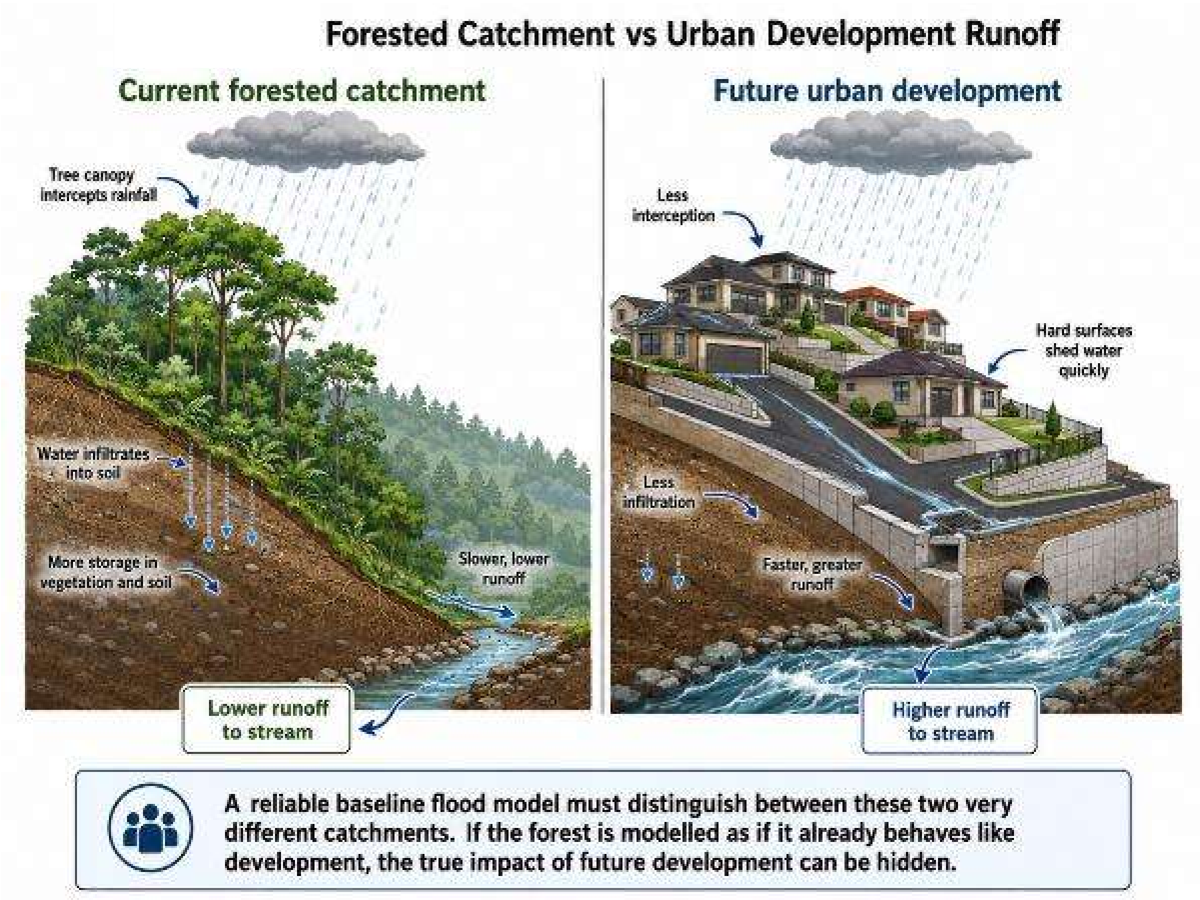


Figure 61 A reliable baseline must distinguish between current forest and future urban development. [Source: Flooding Us NZ Ltd]

As shown in Figure 61 above, a reliable baseline must distinguish between the current forested catchment, which intercepts and absorbs rainfall, and future urban development, which sheds rainfall rapidly from roofs, roads, driveways and other hard surfaces.

Independent flood expert Bob Hall warned that the hydrology being used by GWRC and UHCC grossly overstates runoff volumes expected from the catchment in its present forested state. He also warned that overstating pre-development runoff peaks and volumes diminishes and misrepresents the actual scale of change that should be expected when urban development takes place. His conclusion was blunt: if hydraulic neutrality is applied to this inflated baseline, it will produce spurious results, and hydraulic neutrality will not happen.

This is the heart of the problem.

If today's forested hills are modelled as if they already shed water like developed land, then GTC can later compare its proposed development against that inflated "existing" baseline. The additional runoff from roads, roofs, driveways and hard surfaces may then appear small, manageable, or neutral, not because it really is neutral, but because the baseline has already included the effect of urban development.

That does not protect downstream residents; it undermines the protection that hydraulic neutrality is supposed to provide.

3.2.2 The Upper Stream Channels are Treated as if Already Clogged

There is a second and equally important problem. The model also appears to treat the upper catchment stream channels as if they are already heavily obstructed or clogged.

This is directly relevant to what happened at 125 Pinehaven Road in February and April 2026. At that property, the owners reported that the driveway culvert and stream channel were completely filled with rocks, gravel, debris and sediment during the 16 February flood. A similar problem occurred again on 18 April, when the culvert was unable to convey the flow and water overtopped the driveway.

That was a real-world clogged-channel event.

But this is the critical point: **the official Pinehaven baseline flood model already assumes that this kind of clogged-channel condition exists throughout the upper catchment (that is, for all the stream channels that are upstream of Pinehaven Reserve).**

In SKM's 2010 hydraulic model, a very high Manning's roughness value was applied to upper catchment stream branches. SKM said this was done because many upper tributaries have small private structures (e.g. foot bridges) along them, and that instead of modelling all of those structures, the channel bed resistance was increased.

In practice, this means the model treated the upper catchment streams (all the channels upstream of Pinehaven Reserve) as if they were highly obstructed and resistant to flow.

The values themselves tell the story. The model used:

- **Manning's n = 0.2** for the upper catchment, i.e. for the main stream and all stream branches that are upstream of Pinehaven Reserve;
- **Manning's n = 0.05** for the lower Pinehaven Stream reach from Pinehaven Reserve to Hulls Creek;
- **Manning's n = 0.035** for Hulls Creek; and
- **Manning's n = 0.015** for concrete piped sections.

The very high upper-catchment value of **n = 0.2** (a clogged channel) matters because a normal functioning channel conveys water downstream. A clogged or highly obstructed channel does not: it backs water up, pushes water out of the channel and makes flooding appear much worse.

Council modelled the streams totally clogged!

Figure 62 shows how the future has been built into the baseline flood model. SKM's Pinehaven flood model used a very high roughness value for all the upper catchment stream channels, effectively treating all the existing channels that are upstream of Pinehaven Reserve as if they are already severely obstructed or clogged.

Figure 62 The future built into the baseline

This is why the clogged channel at 125 Pinehaven Road is so important. It is not only an isolated local problem. It shows the kind of degraded channel condition that GWRC's Pinehaven flood model already assumes as the existing baseline throughout the upper catchment.

In other words, the model does not represent the real existing pre-development catchment. It represents a catchment that is already degraded by the effects of future urban development, a catchment in which the kind of debris, scour, sediment and blockage problems beginning to appear at 125 Pinehaven Road are assumed to be the normal "existing" condition.

That is not a reliable baseline.

A reliable baseline should represent the catchment as it actually was before major recent forestry clearance and before GTC's proposed development: forested hillsides, functioning tributary channels, and the actual culverts and structures (e.g. foot bridges) that existed at the time of the flood study. Instead, the model appears to combine two assumptions that inflate the present-day condition:

1. rainfall losses that treat the forested hills as if they already behave more like urbanised land;
2. upper catchment channels modelled as if they are already severely obstructed or clogged.

The result is a baseline that already contains the future damage residents are trying to prevent.

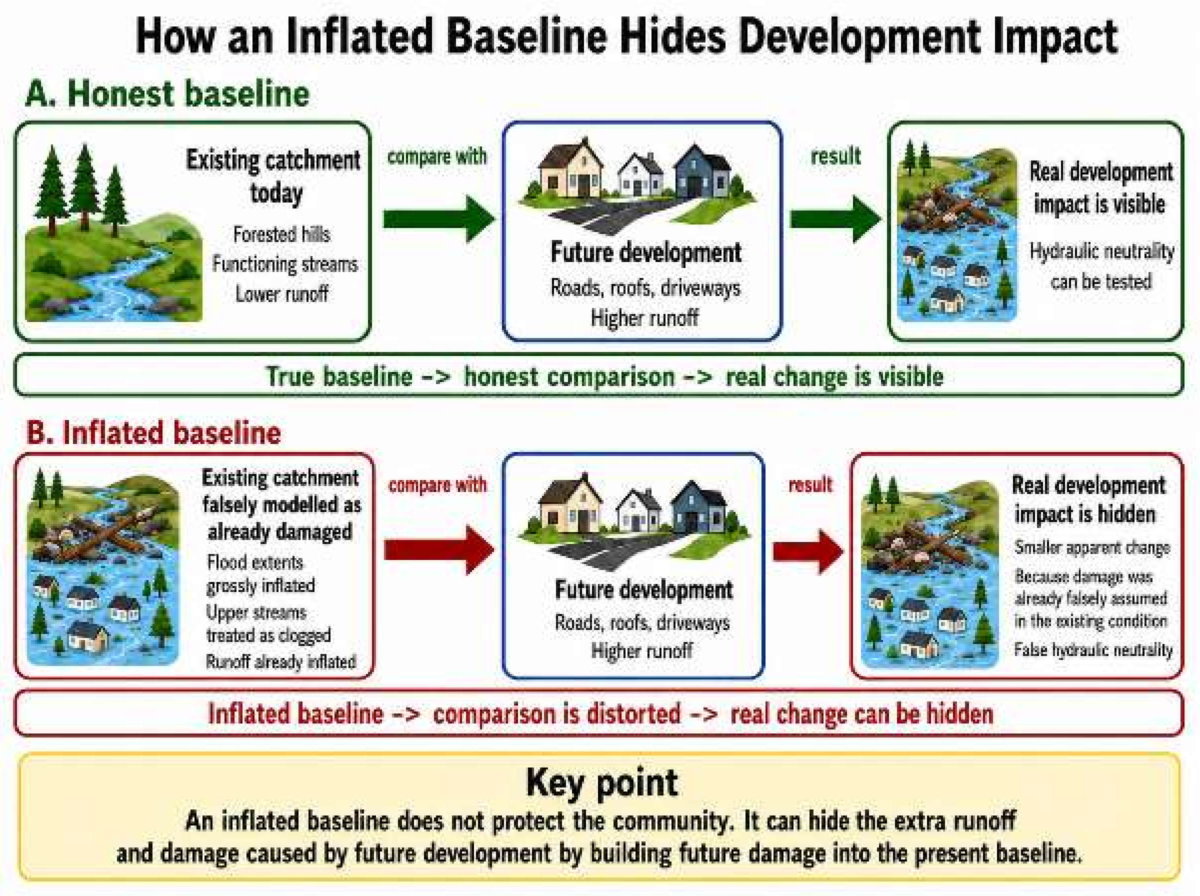


Figure 63 Reliable Baseline vs Inflated Baseline [Source: Flooding Us NZ Ltd]

A reliable baseline shows forested hills and functioning stream channels. The Pinehaven baseline appears to model the forested hills as if they already generate urban-style runoff, and the upper stream channels as if they are already clogged or heavily obstructed.

3.2.3 Why this Defeats Hydraulic Neutrality

Hydraulic neutrality depends on a reliable baseline.

The whole idea is simple: future development should not make downstream flooding worse. To test that, the modeller must first establish the real existing runoff from the catchment, then compare it with the runoff expected after development. The developer must then manage the difference.

But if the "existing" baseline already includes the hydrological effects of future development, the comparison is meaningless.

The Pinehaven baseline appears to do exactly that. It treats the existing forested hills as if they already produce much higher runoff, and it treats upper stream channels as if they are already clogged or heavily obstructed. That means the baseline has already included the very effects future development is supposed to avoid.

Hydraulic neutrality cannot be tested honestly against a baseline like that.

The problem can be stated in one sentence:

An inflated baseline can make future development look neutral by treating the damage it can cause (increased flooding and clogged stream channels) as if it already exists today.

That is why inflated flood maps are not "conservative" or "cautious". They are dangerous. They make today's catchment look worse than it really is, so that tomorrow's development effects can be made to look smaller than they really are.

Bob Hall also warned about the physical consequences of increased runoff in steep catchments. Increased runoff does not merely increase water volume. It can change stream behaviour, causing stream-bed incision, channel widening, lateral bank erosion, sediment loading, aggradation of stream beds and blocking of culvert entries.

Those are not theoretical concerns. They are exactly the kinds of effects now being observed in Pinehaven and Silverstream: runoff from cleared hillsides, scoured stream beds, eroded banks, gravel and rocks moving downstream, culverts blocking, and debris dams forming.

The model has therefore anticipated the future problem in the wrong way. It has not protected the community by preventing the problem. It has built the problem into the baseline.

The result is dangerous: the true impact of future development may be hidden.

If the model already assumes high runoff, clogged channels and exaggerated flooding in the existing catchment, then GTC's additional runoff may appear minor or "neutral". That could lead to insufficient stormwater mitigation by the developer, leaving Pinehaven and Silverstream exposed to greater flooding, erosion, sediment movement, debris blockages and landslide risk.

If GTC's hillside development is approved against that inflated baseline, the inflated baseline model and existing flood maps may become the future reality: more runoff, more erosion and more landslides, more sediment, more debris, more blocked culverts, and more flooding downstream.

3.3 The Serious Adverse Consequences

The consequences of relying on an inflated baseline model are serious.

First, it can allow the wrong conclusion about GTC's proposed development. If the baseline already exaggerates existing runoff, then the additional runoff from development can be understated and mitigation measures inadequate. GTC may be able to claim hydraulic neutrality even if the real-world result is more runoff, faster runoff, greater sediment movement, more landslides, more stream scour, more blocked culverts, and increased flooding downstream.

Second, it can misdirect the Pinehaven Stream Improvements project. The current streamworks are focused downstream of Pinehaven Reserve. But the February and April 2026 events show serious problems in the upper catchment upstream of Pinehaven Reserve: the blocked culvert near 108A Wyndham Road, the clogged channel at 125 Pinehaven Road, the debris dam in the upper Pinehaven Stream valley, the overtopped driveway culvert at 122 Pinehaven Road, and isolated Jocelyn Crescent road sumps discharging onto private property. If the model is wrong, then the stream improvements must be reassessed against the real risks now being observed.

Third, inflated maps can damage residents while still failing to protect them. Many homes may be wrongly shown as flood-prone, affecting LIMs, insurance, saleability and property values. At the same time, residents who are genuinely exposed to increased runoff, sediment, debris and landslide hazards from the hills may receive little practical protection because the model has not identified the real mechanism of harm.

Fourth, an inflated baseline can make future flooding worse. If the model already assumes the upper catchment is degraded, clogged and generating high runoff, then future real-world degradation may not show as a major "increase" in the model. The danger then becomes invisible inside the modelling process.

Fifth, delay creates risk. Waiting until after GTC's fast-track approval, after further hillside clearance, or after further Pinehaven streamworks would be backwards. The model must be fixed now before the next round of decisions, not after them.

The appropriate response is not to wait for lengthy law reform, although stronger forestry rules may be needed.

The immediate response must be to fix the baseline model now.

That means:

1. an urgent independent review of the Pinehaven hydrology and hydraulic model;
2. recalibration against the observed 8 December 2019, 16 February 2026 and 18 April 2026 flood events;
3. a corrected existing baseline that properly represents the current pre-development forested catchment;
4. a transparent reassessment of GTC's proposed development against that corrected baseline;
5. a reassessment of the Pinehaven Stream Improvements project, including affected upper-catchment properties and infrastructure; and

6. urgent practical action on known problems such as the 108A Wyndham Road culvert, 122 Pinehaven Road culvert, Jocelyn Crescent road sumps, and the debris dam in the upper Pinehaven Stream valley.

Until that is done, the community cannot have confidence that hydraulic neutrality means what it says.

Nor can residents be confident that the flood maps, stream improvements or planning decisions are protecting them from the real risk.

The baseline model must be fixed now before GTC's hillside development is assessed for approval.

Otherwise, the inflated model will not protect Pinehaven and Silverstream. It will help make the present warning signs become the future reality.

Why this matters

If the baseline model assumes inflated flood extents and that existing upper catchment streams are already clogged, then future development can add extra runoff without looking much worse on the map. The model has already built the future damage into the existing baseline. That is why an inflated baseline does not protect the community. It removes the community's main protection.

4. Other Observed Flooding on 18 April 2026

4.1 Overtopped driveway culvert at 122 Pinehaven Road

An overtopped driveway culvert at 122 Pinehaven Road caused flooding down the full width of the carriageway to the low point of Pinehaven Road by the Pinehaven School netball courts.

Figure 64 18-4-26 10:01am Debris from overtopped culvert 122 Pinehaven Rd

Some driveways and garages received significant flow that overtopped road gutters and berms.

Figure 65 18-4-26 9:58am View south up Pinehaven Rd – full carriageway and berms flooded

Figure 66 Pinehaven Road (from Forest Road to Library) 18 April 2026 09:37am (after peak flow)

4.2 Jocelyn Crescent

Water from the overtopped culvert at 122 Pinehaven Road (Figure 64) flooded the intersection at the southern end of Jocelyn Crescent on 18 April (Figure 67). A local resident on the scene said flooding down Pinehaven Road was worse than during the storm two months earlier (16 Feb).

Figure 67 18-4-26 9:44am Intersection of Pinehaven Road and Jocelyn Crescent (southern end)

This is a repeat of what happened during the storms on 8 December 2019 and 16 February 2026.

Figure 68 18-4-26 9:44am -Water flowing along Jocelyn Crescent from Pinehaven Road

Figure 69 18-4-26 9:44am – Low point in road at 39 Jocelyn Crescent

Figure 70 18-4-26 9:44am Water from 122 Pinehaven Road entered 39 Jocelyn Crescent

Figure 71 18-4-26 9:55am Public drain discharging into 37 Jocelyn Crescent

A public drain from under the road discharges into 37 Jocelyn Crescent (Figure 71) …

… causing flooding at 37 Jocelyn Crescent (Figure 72) …

… and 39 Jocelyn Crescent (Figure 73).

Figure 72 18-4-26 9:55am 37 Jocelyn Cres.

Figure 73 18-4-26 9:55am 39 Jocelyn Cres.

4.3 Wyndham Road

The overtopped culvert near 108A Wyndham Road caused silt-laden water to run down Wyndham Road. Local residents said it ran from the crown of the road to over the footpath.

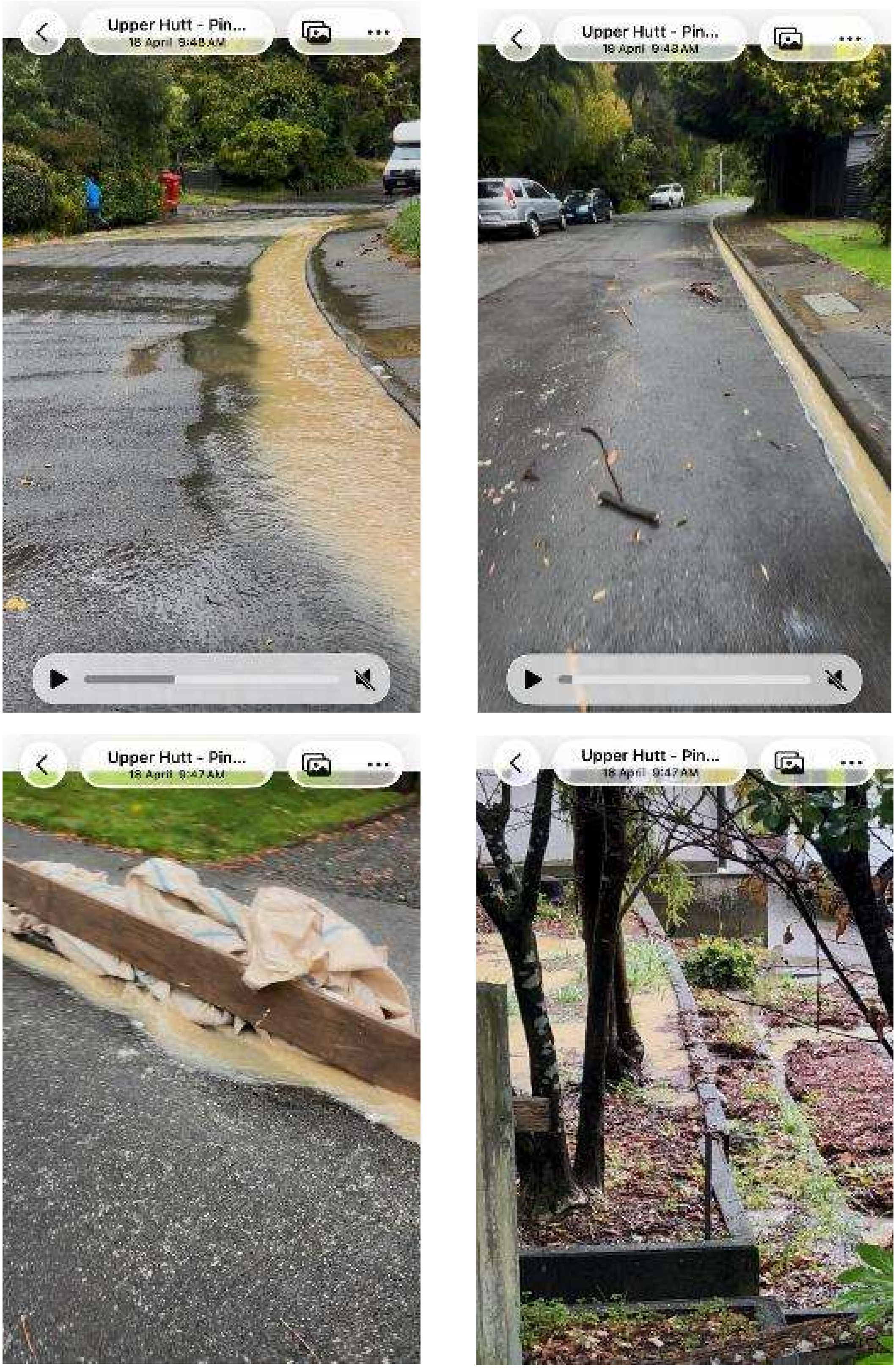


Figure 74 Wyndham Road, 18 April 2026, 09:47am (after peak flow)

Water from the overtopped culvert near 108A Wyndham Road ran down Wyndham Road and into road sumps on each side of Jocelyn Crescent (Figure 75). These sumps are isolated from the public stormwater main drain which terminates a little further along Jocelyn Crescent. So these two isolated sumps discharge into an open channel on private property at 23 Jocelyn Crescent. After flowing through 23 Jocelyn Crescent, the open channel overtopped and flooded the back yard of 72 Pinehaven Road, similar to what happened on 8 December 2019 (Figure 76).

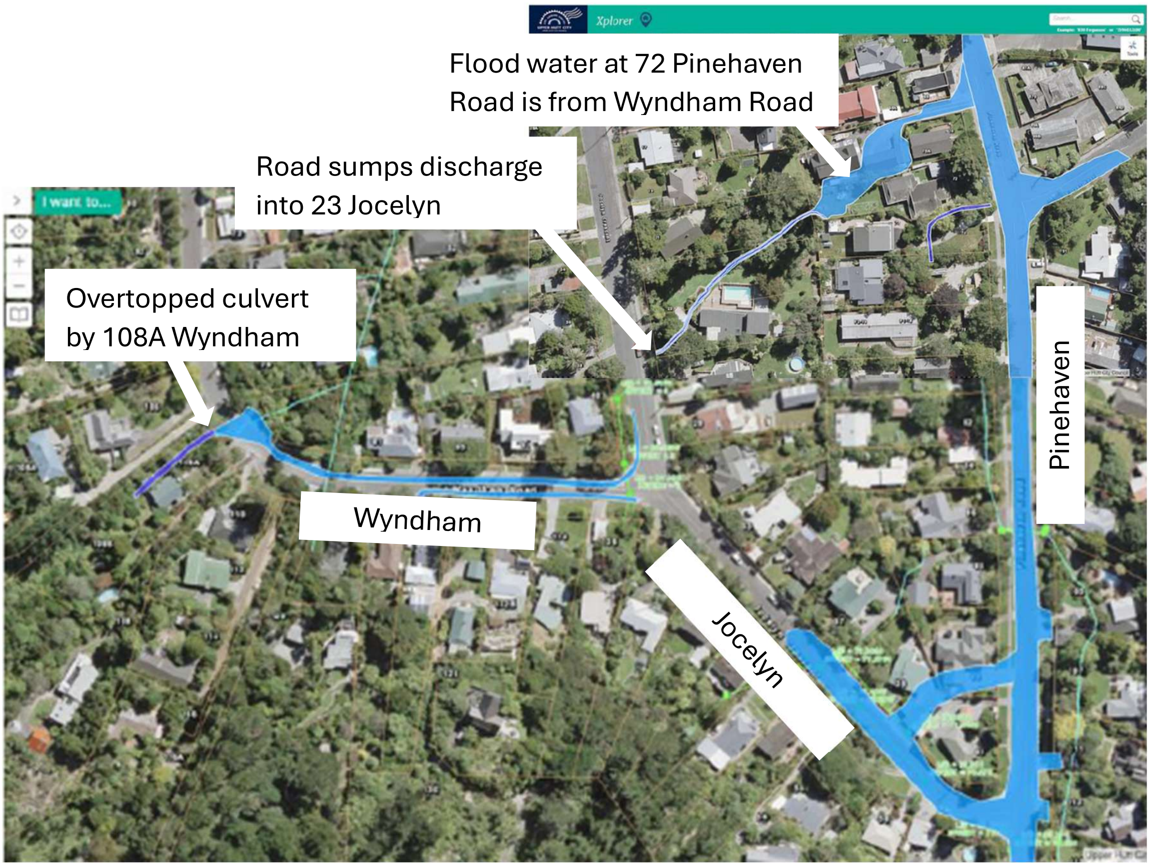


Figure 75 Flooding 8 Dec 2019 in Wyndham and Jocelyn - similar again 18 April 2026

On 8 December 2019, flood water from the overtopped culvert by 108A Wyndham Road ended up flooding the back yard of 72 Pinehaven Road (Figure 75 and Figure 76). The resident owner of 72 Pinehaven Road said his back yard flooded again on 18 April 2026 (pers. com.).

This could be avoided if Council extended the existing stormwater drain in Jocelyn Crescent to connect to the two isolated road sumps instead of simply discharging them into the channel on the property at 23 Jocelyn Crescent.

Figure 76 Flooding on 8 Dec 2019 at 72 Pinehaven Rd (Photo: Murray Quinn)

4.4 Elmslie Road

We observed no flooding in Elmslie Road on 18 April 2026.

4.5 Forest Road

Water running down Pinehaven Road was observed entering Forest Road and ponding around the first road sumps on both sides of Forest Road.

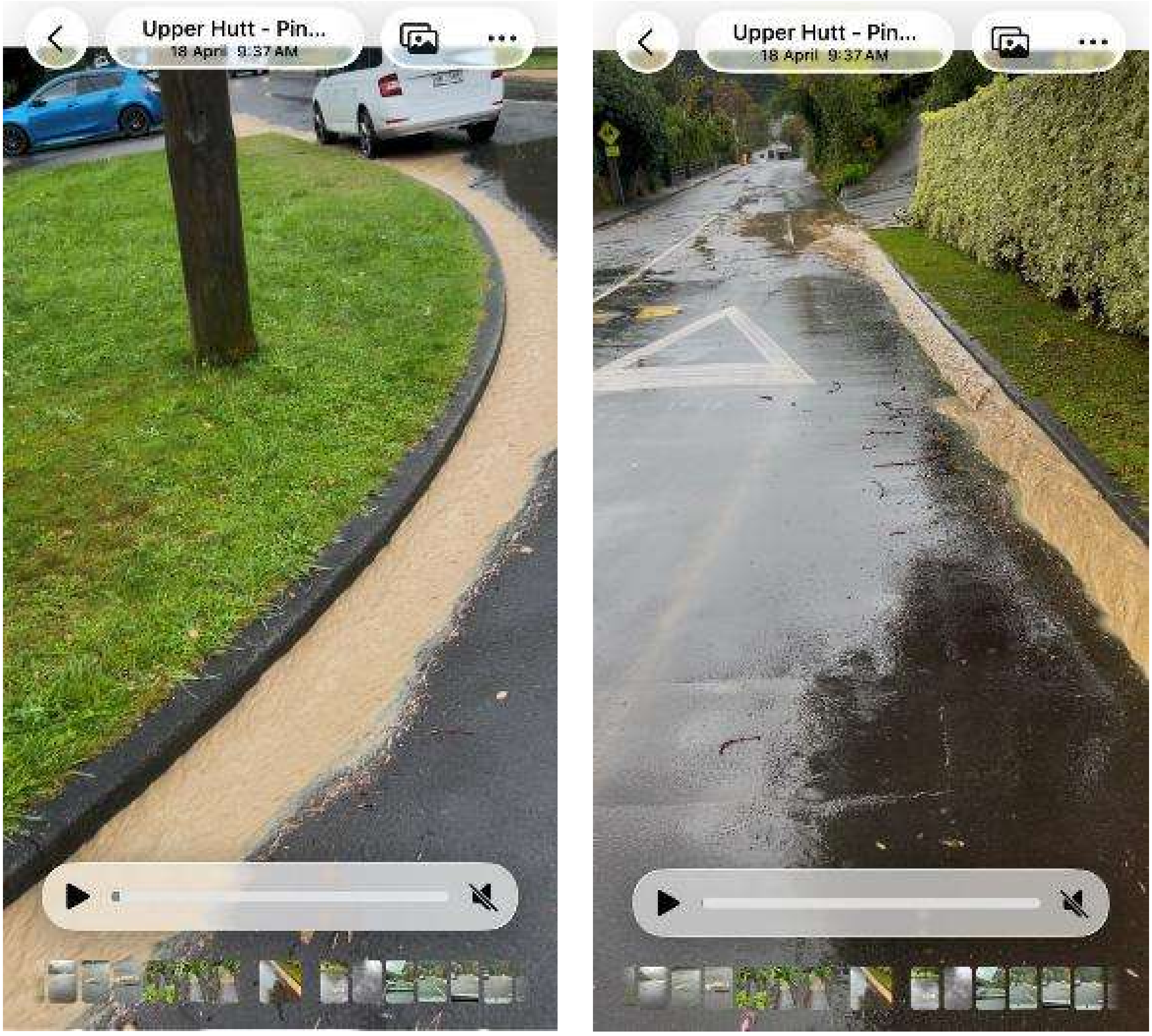


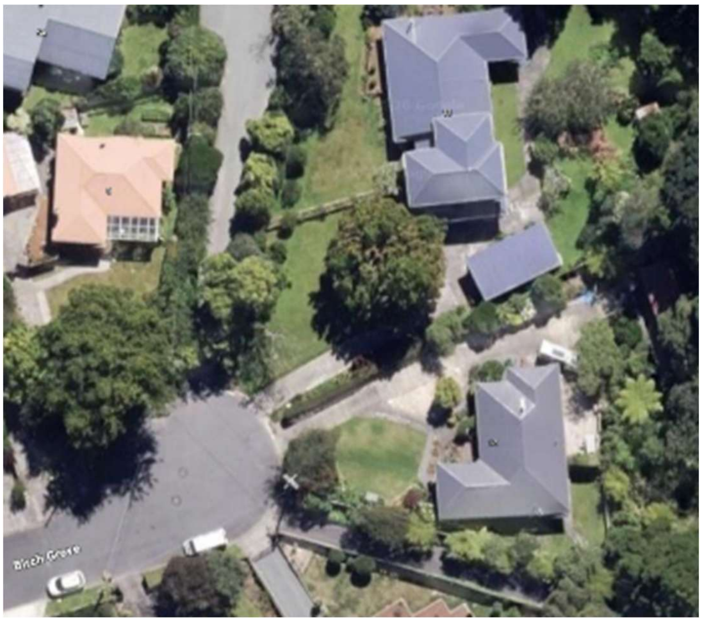
Figure 77 Water from Pinehaven Road entered Forest Road, 18 April 2026, 9:37am

4.6 Birch Grove Cul-de-sac

The photo below (*Figure 78*) shows water starting to pond above the road sumps between the driveways to No. 11 (left) and No. 12 (centre). This is before the peak flow at around 9:30am on 18 April 2026.

The resident owner at No. 11 commented that water from the stream behind the house at No.12 flowed down the driveway of No. 12 and up his driveway at No. 11 as far the front of the garage, saying that the water rose and receded quickly, and was worse than in February 2026.

Figure 78 Birch Grove cul-de-sac: garage at No. 11 (left); house at No. 12 (centre)



"During the storm on 18 April 2026, water came out of the stream channel behind the house at 12 Birch Grove and down its driveway into the Birch Grove cul-de-sac, then up into our driveway at 11 Birch Grove as far as the front of the garage and then receded again. It all happened very fast, within an hour. It was worse in April than it was in the previous storm in February."

Peter Ross, Resident owner 11 Birch Grove (pers. com. 11-5-2026)

Figure 79 Birch Grove cul-de-sac - Google aerial view

4.7 Flooding at Nos. 30 – 36 Blue Mountains Road

Flooding occurred on 18 April 2026 on the low lying land along Pinehaven Stream immediately downstream of the new Pinehaven Road culvert from 36 to 28 Blue Mountains Road.

Figure 80 18 April 2026 - 36 Blue Mountains Road, 8:36am rising and 10:14am receding

Figure 81 18 April 2026, 10:15am - 32 Blue Mountains Road – water receding

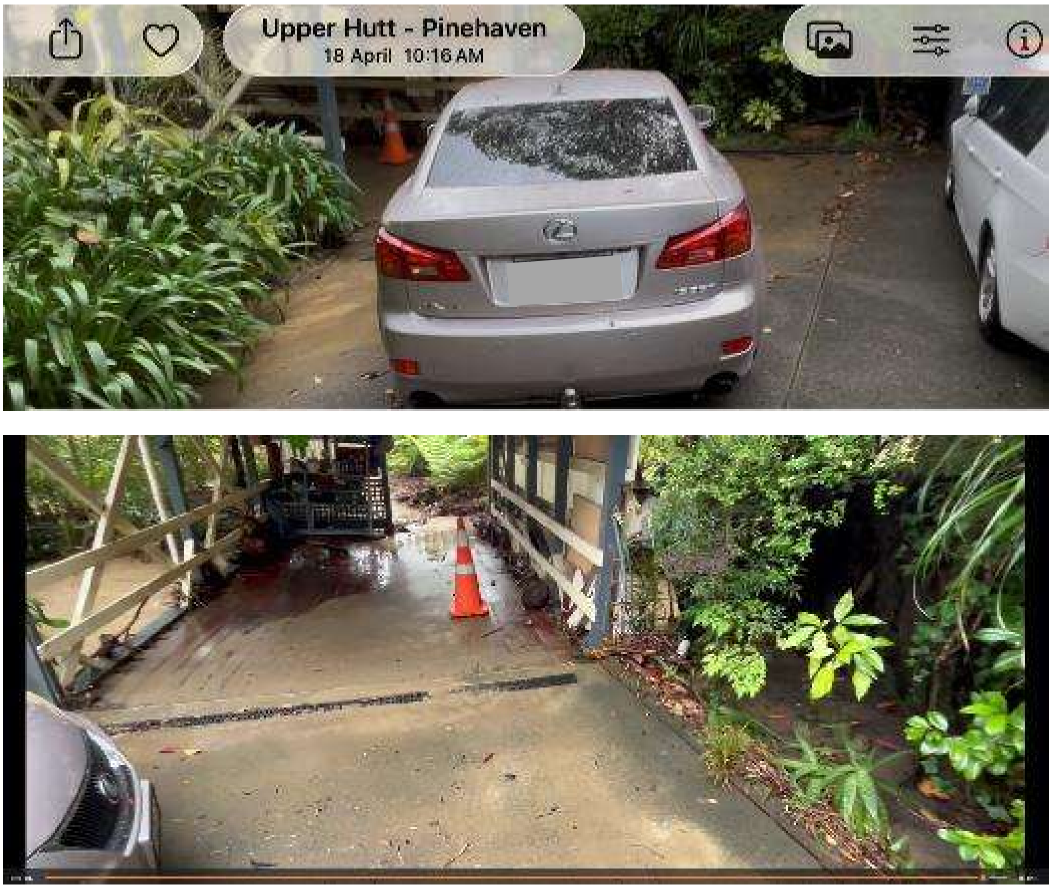


Figure 82 18 April 2026, 10:15am - 30 Blue Mountains Road – water has flooded the bridge

4.8 Willow Park

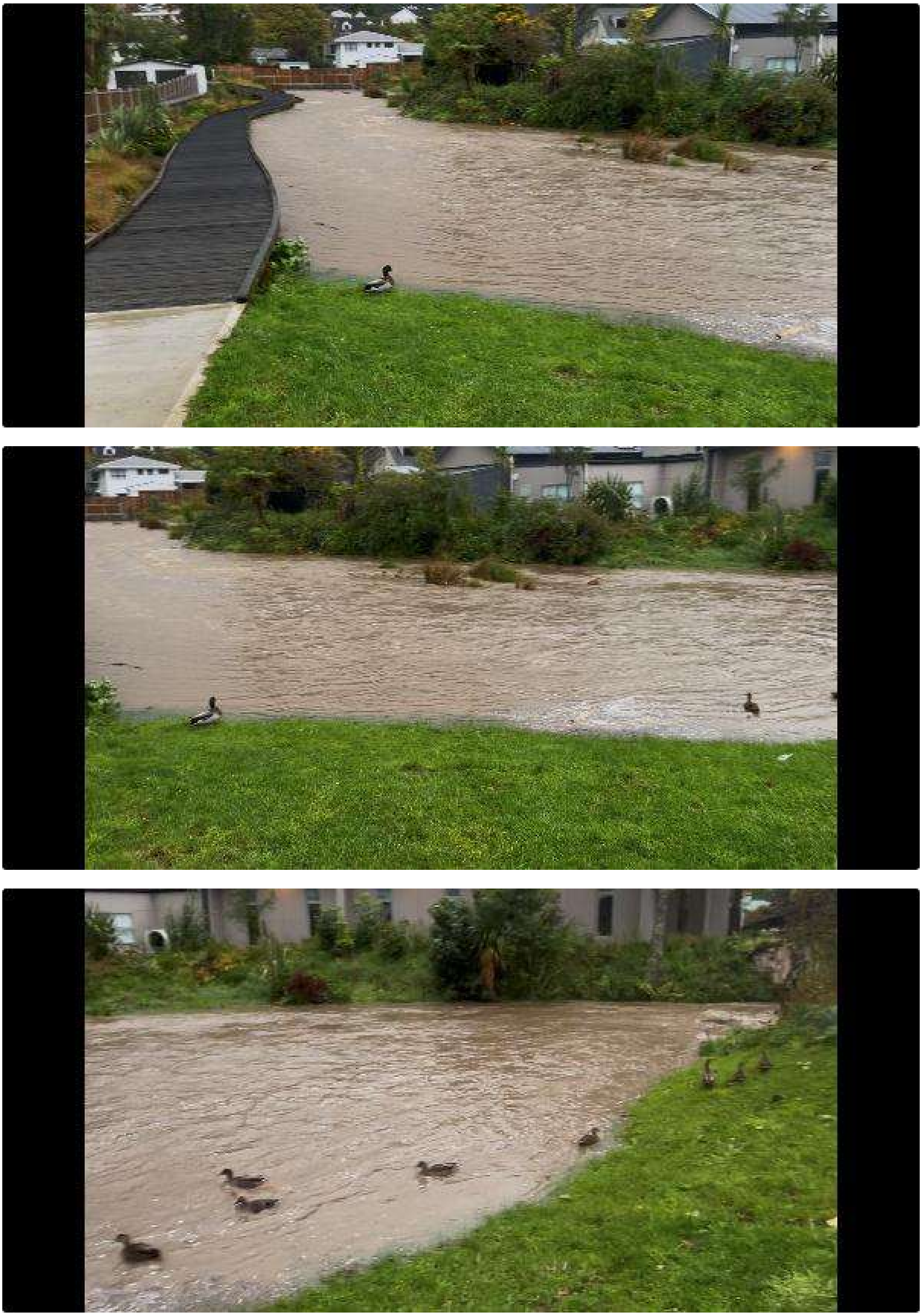


Figure 83 Willow Park - 18 April 2026 at 08:41am (before peak flow)

5. Size of the Flood on 18 April 2026

5.1 Rainfall

The 24-hour rainfall on Saturday 18 April 2026 recorded at GWRC's rain gauge at Pinehaven Reservoir totalled 101.3mm (Figure 84 and Figure 85).

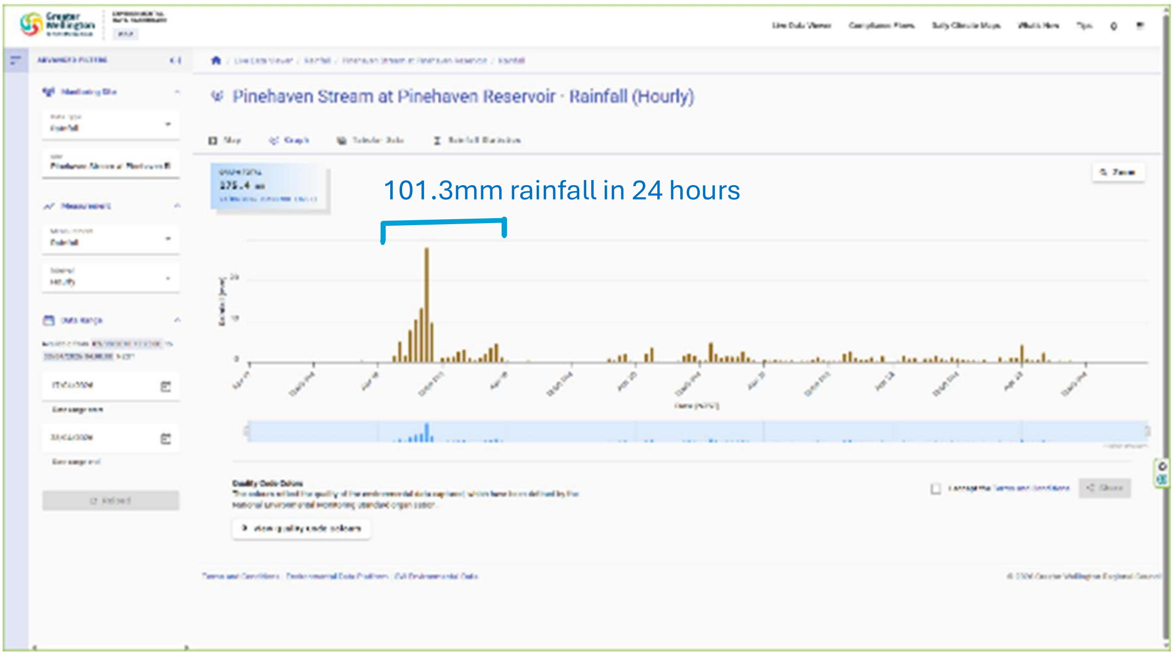


Figure 84 GWRC Pinehaven Reservoir Rainfall - Graph

Date/Time Rainfall (mm)

)	0	200			
)	0	200			
)	0	200			
)	0.2	200			
)	1.6	200			
)	5	200			
)	1.8	200			
)	7.9	200			
)	10.5	200			
)	13.3	200			
)	28.2	200			
)	9.7	200	76.4	in 7 hrs	71.4mm in 6 hrs
)	0	200			
)	1	200			
)	1.2	200			
)	1.3	200			
)	2.7	200			
)	3.1	200			
)	0.9	200			
)	0.4	200			
)	1	200			
)	2	200			
)	3.5	200			
)	4.6	200			
)	1.2	200			
)	0.2	200	101.3	in 24 hrs	
)	0	200			

Figure 85 GWRC Pinehaven Reservoir Rain Gauge – Table

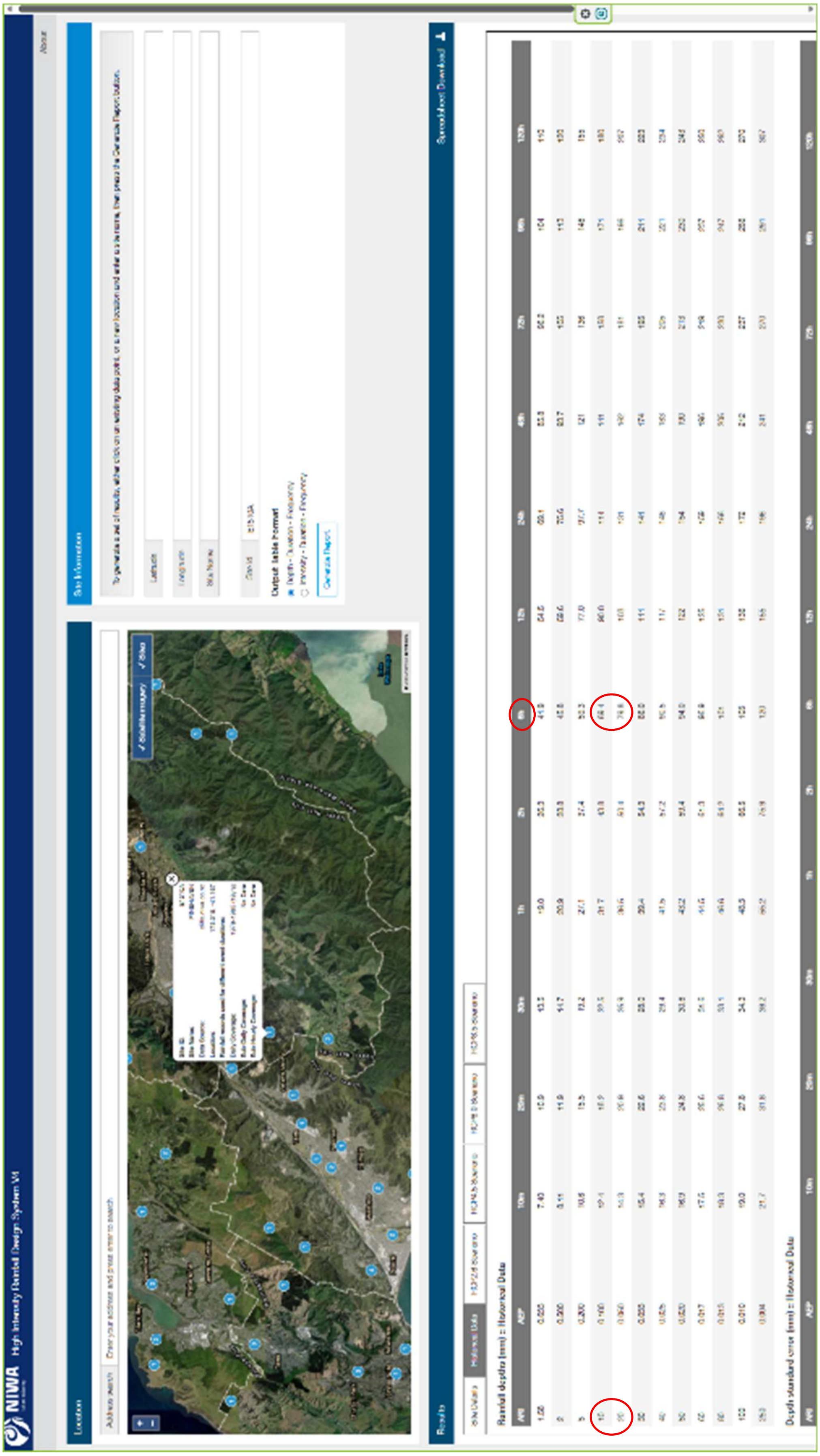


Figure 86 NIWA - HIRDSv4 - Pinehaven Reservoir Rain Gauge - Historical Rainfall Data

On 18 April there was 76.4mm of rainfall in 7 hours from 3:00am to 10:00am recorded at the Pinehaven Reservoir rain gauge, and 71.4mm in 6 hours from 4:00am to 10:00am (Figure 85). NIWA High Intensity Rainfall System v4 (HIRDSv4) doesn't show rainfall for a 7-hour period. HIRDSv4 Historical Data indicates that for a 6-hour period 69.4mm is a 10-year rainfall event and 79.8mm is a 20-year rainfall event (Figure 86).

To the south, the GWRC Tasman Vaccine Ltd (TVL) rain gauge in TVL Road, Whitemans Valley (Figure 87), recorded a 24-hour rainfall of 109.6mm on 18 April 2026, with 84mm of rainfall in 7 hours from 3:00am to 10:00am, and 76.6mm in 6 hours from 4:00am to 10:00am (Figure 89).

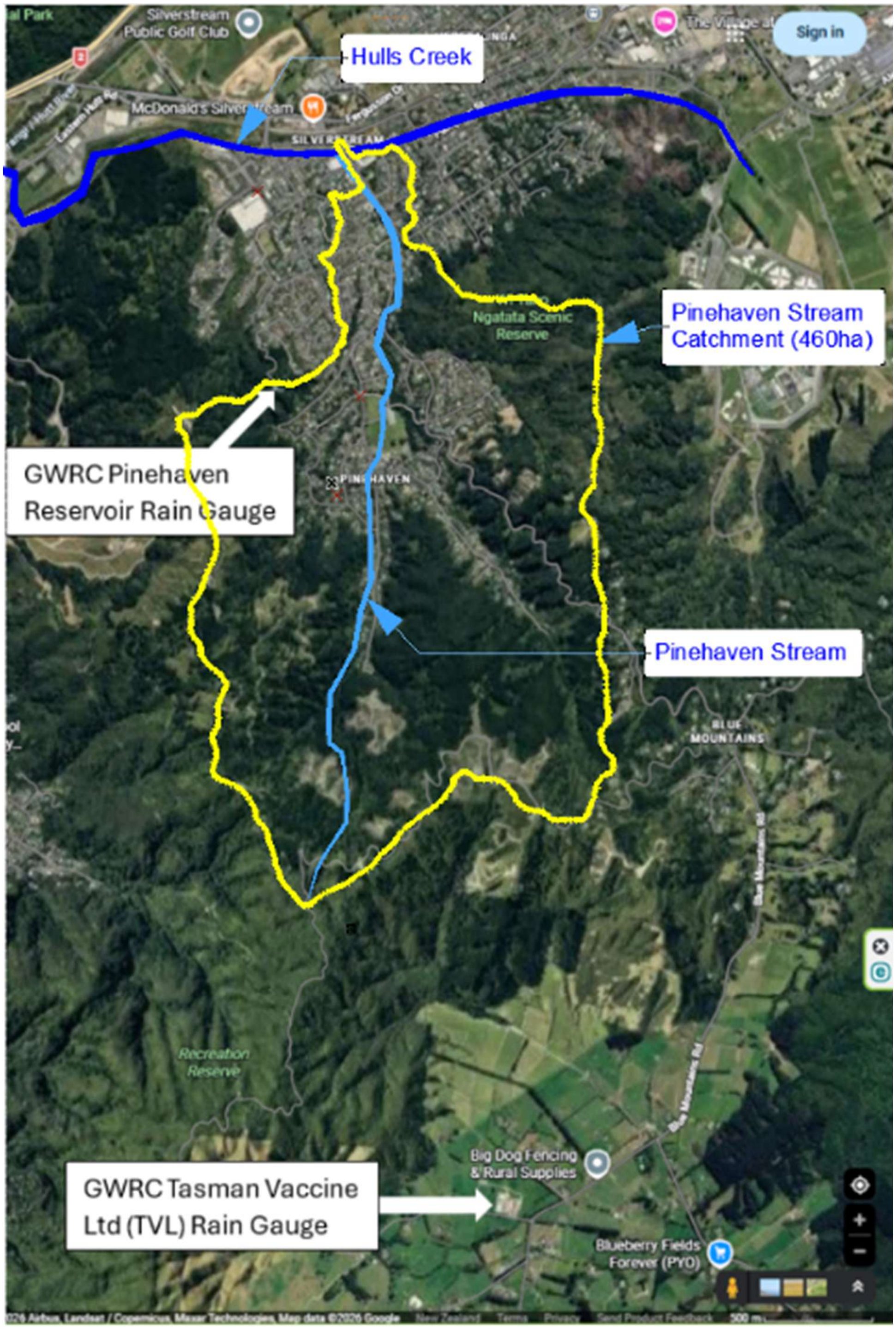


Figure 87 Google Map - GWRC Pinehaven and TVL Rain Gauge Locations

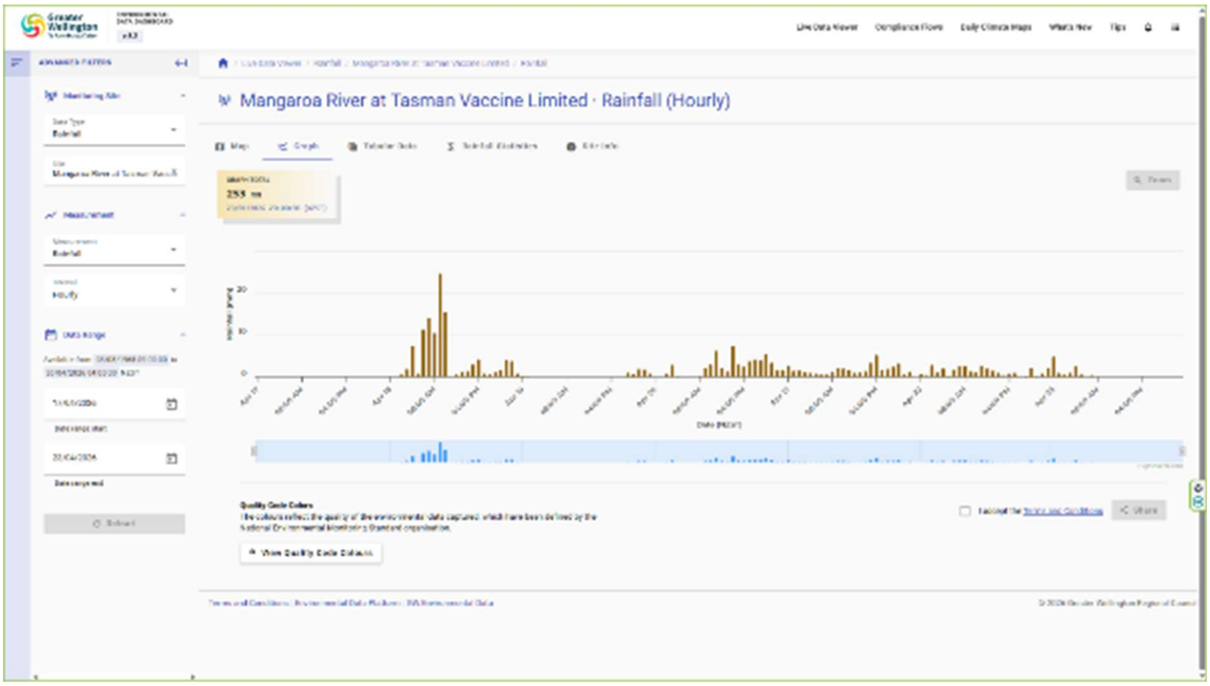


Figure 88 GWRC Tasman Vaccine Ltd (TVL) Rainfall – Graph

Date/Time	Rainfall (mm)				
23:00	0	200			
6 0:00	0	200			
6 1:00	0	200			
6 2:00	0.6	200			
6 3:00	1.8	200			
6 4:00	7.4	200			
6 5:00	0.8	200			
6 6:00	11.3	200			
6 7:00	13.9	200			
6 8:00	10.5	200			
6 9:00	24.7	200			
10:00	15.4	200	84	in 7 hrs	76.6mm in 6 hrs
11:00	0	200			
12:00	0.6	200			
13:00	1.2	200			
14:00	1.3	200			
15:00	3	200			
16:00	4.1	200			
17:00	0.8	200			
18:00	0.6	200			
19:00	1.2	200			
20:00	1.6	200			
21:00	4	200			
22:00	3.7	200			
23:00	0.9	200			
6 0:00	0.2	200	109.6	in 24 hrs	
6 1:00	0.2	200			

Figure 89 GWRC Tasman Vaccine Ltd (TVL) Rainfall - Table

5.2 Observed Stream Level at Original Staff Gauge

Location of the original stream gauge (2008 – 2013) and staff gauge in Pinehaven Stream:

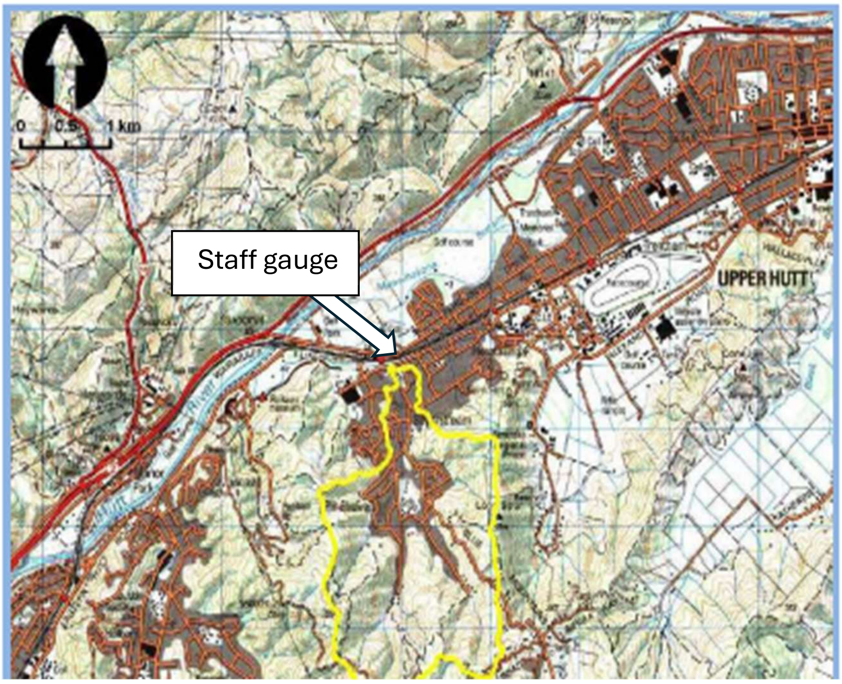


Figure 90 SKM - 2010, Pinehaven Flood Hazard Investigation Report, Fig. 1 - Location of Pinehaven Catchment (outlined in yellow)

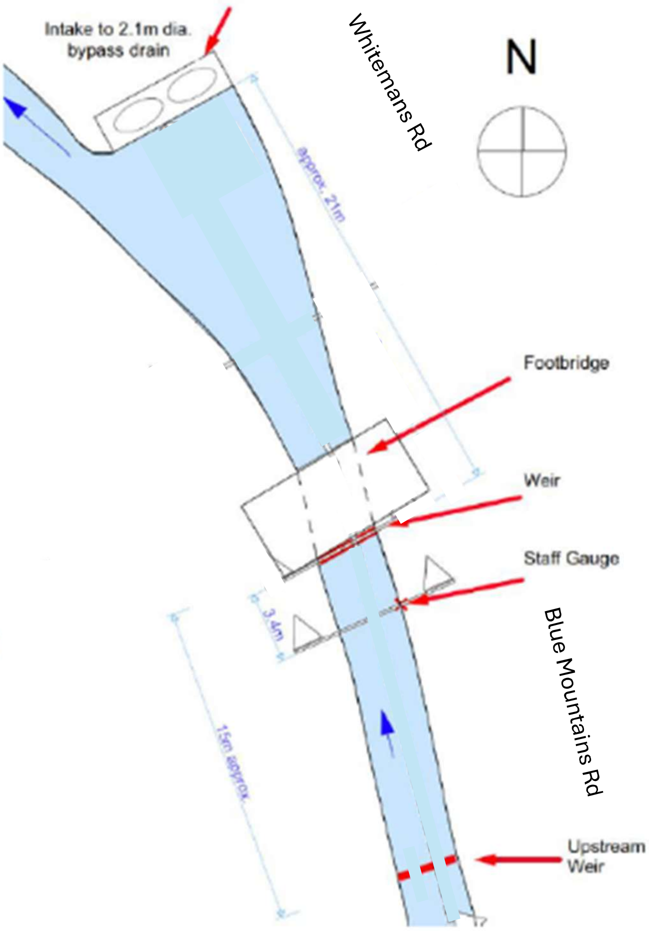


Figure 91 Diagram of Staff Gauge site, near Reformed Church, 4 - 8 Blue Mountains Road, Silverstream

The following photographs (Figure 92 to Figure 97) were taken at the Pinehaven Stream staff gauge located in the stream channel by the Reformed Church, 4 – 8 Blue Mountains Road, Silverstream, during the storm on 18 April 2026. These six photographs show the changes in the stream level from 8:45am to 12:17pm.

Figure 92 8:45am / water level 1.18m

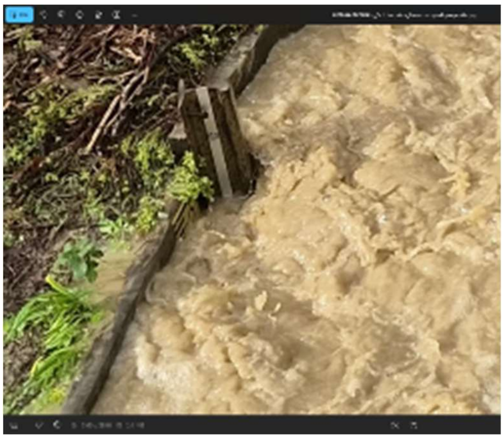


Figure 93 10:07am / water level 1.24m [Photo: C. Leenders]

Figure 94 10:22am / water level 1.05m

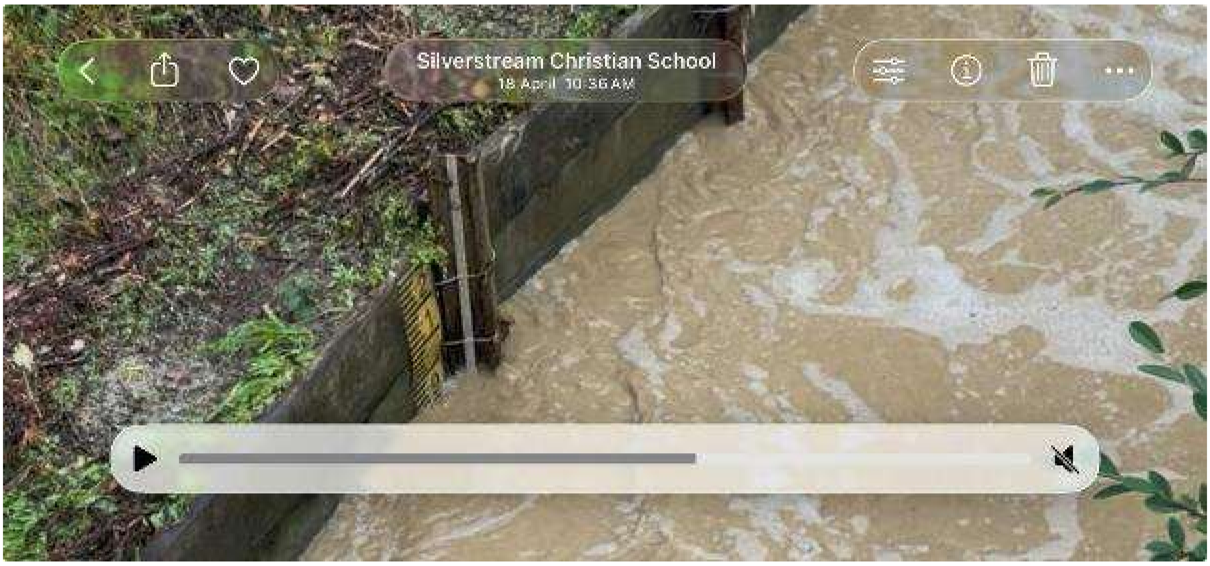


Figure 95 10:36am / water level 0.93m

Figure 96 11:39am / water level 0.73m

Figure 97 12:17pm / water level 0.67m

We estimate that the peak water level may have been about 1.46m at about 9:30am.

This is based on the water level having not yet reached the peak at 8:45am (Figure 92) and having passed the peak by 10:07am (Figure 98 below).

Figure 98 Pinehaven Stream (by Reformed Church) 10:07am, 18 April 2026 [Photo: C. Leenders]

The debris on the bank above the timber retaining wall on the left side of the stream in the photo above (Figure 98) shows that at peak flow the water overtopped the retaining wall (Figure 99). The height of the top of the timber retaining wall at the staff gauge is shown on the staff gauge as 1.31m. By measuring the level of the debris above the top of the retaining wall, we estimate that the water level peaked at about 150mm above the top of the retaining wall at the staff gauge.

Figure 99 Debris on the bank above the staff gauge on the retaining wall

Figure 100 Measuring level of debris above retaining wall

Figure 101 Level of debris

The height of the debris above the retaining wall at the staff gauge is about 0.15m (150mm). We therefore estimate that the water level peaked at about 1.31 + 0.15 = 1.46m.

We have included this estimated peak in the following table and manually drawn hydrograph.

At 1.46m deep, the cross-sectional area of water is approximately 4.92m^2 (Figure 102). Assuming a velocity of about 2.2m/s suggests a peak flow at the staff gauge of about 10.8m^3/s (Figure 105).

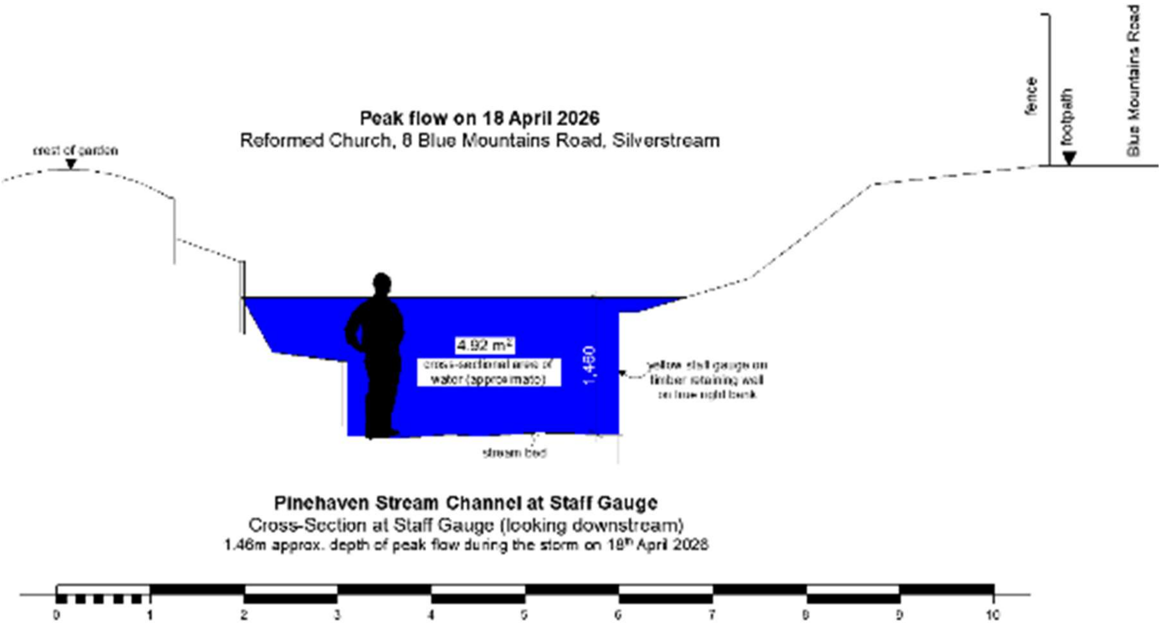


Figure 102 Cross-Section of Channel at Staff Gauge, 8 Blue Mountains Road

The peak stream level of about 1.46m on 18 April 2026 was higher than on 16 February 2026, which was about 1.41m. The 6-hour rainfall was more intense on 18 April, 71.4mm (Figure 85) compared with 61.3mm on 16 February, recorded at the Pinehaven Reservoir gauge. The TVL rain gauge recorded 76.6mm in 6 hours on 18 April (Figure 89), suggesting rainfall on the hills at the top of the Pinehaven catchment may have been higher than at the Pinehaven Reservoir.

The impact of recent harvesting of pine forest on stream levels during intense storms is unclear and should be considered.

An aerial map (Figure 16) shows areas of cleared pine forest roughly identified in red outline. These areas are within the Pinehaven Stream catchment (shown with a yellow outline) and may be contributing silt and sediment in runoff downstream.

Pinehaven Stream Staff Gauge Site		
Reformed Church, 4 - 8 Blue Mountains Road, Silverstream		
Time	**Stage (m)**	
Saturday 18 April 2026		
08:45:00	1.18	8:45am
~ 9:30:00 am	1.46	~ 9:30am
10:07:00	1.24	10:07am
10:22:00	1.05	10:22am
10:36:00	0.93	10:36am
11:39:00	0.73	11:39am
12:17:00	0.67	12:17pm

Figure 103 Table of Time and Stage (water depth) at staff gauge on 18 April 2026

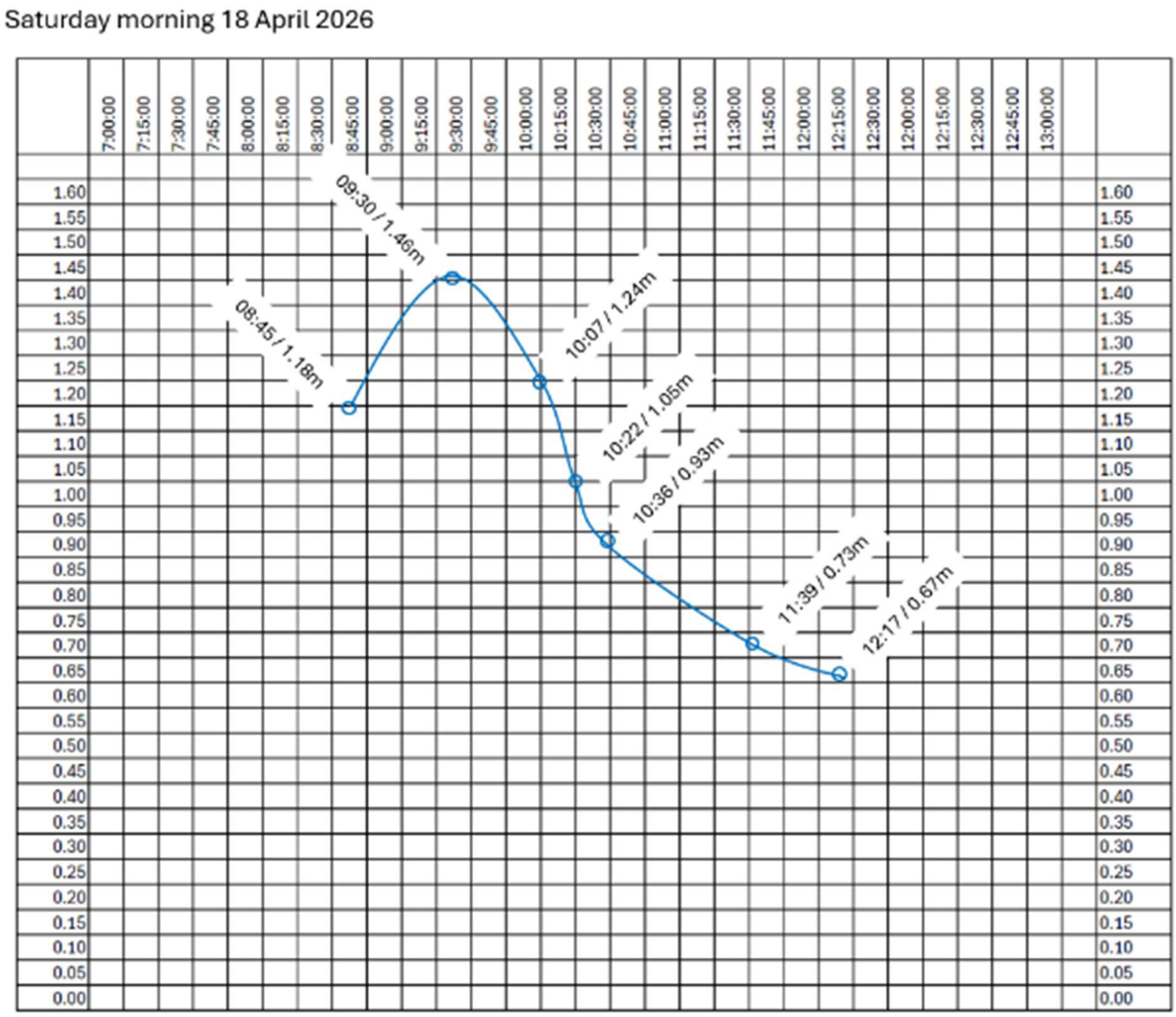


Figure 104 Manually drawn hydrograph of time and water depth on 18 April 2026

5.3 Size and Return Period of Flood Event 18 April 2026

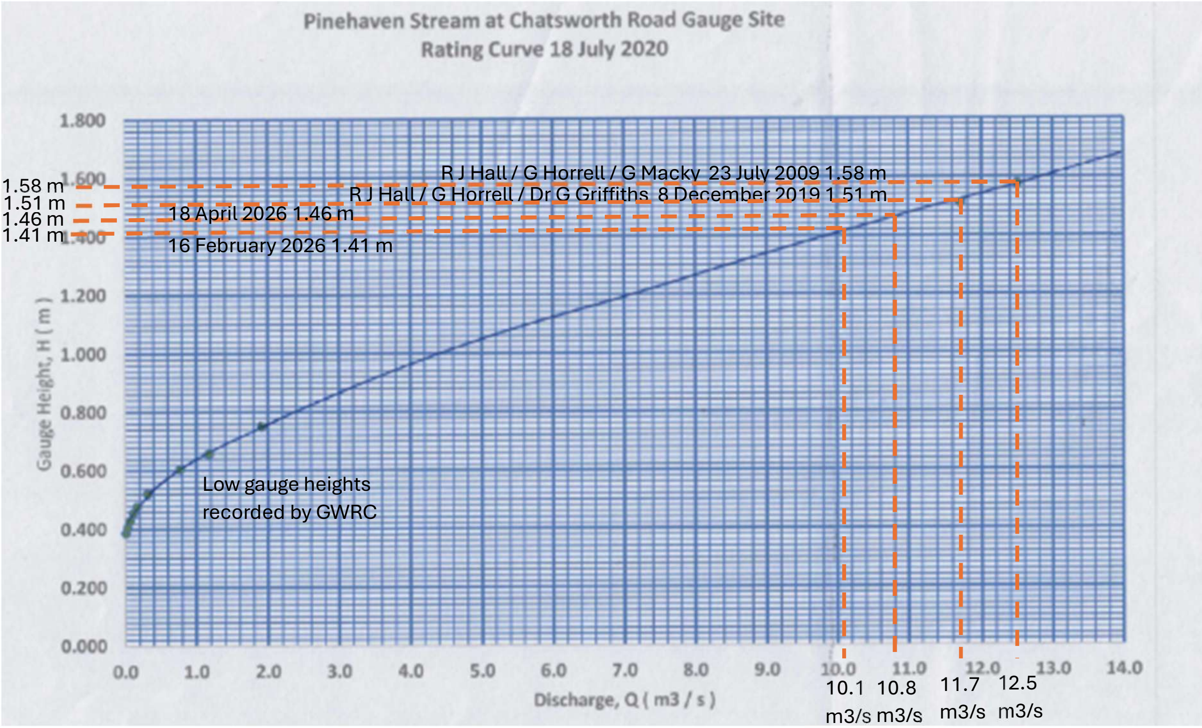


Figure 105 Rating Curve at Pinehaven Stream Staff Gauge Site (R J Hall & Associates Ltd)

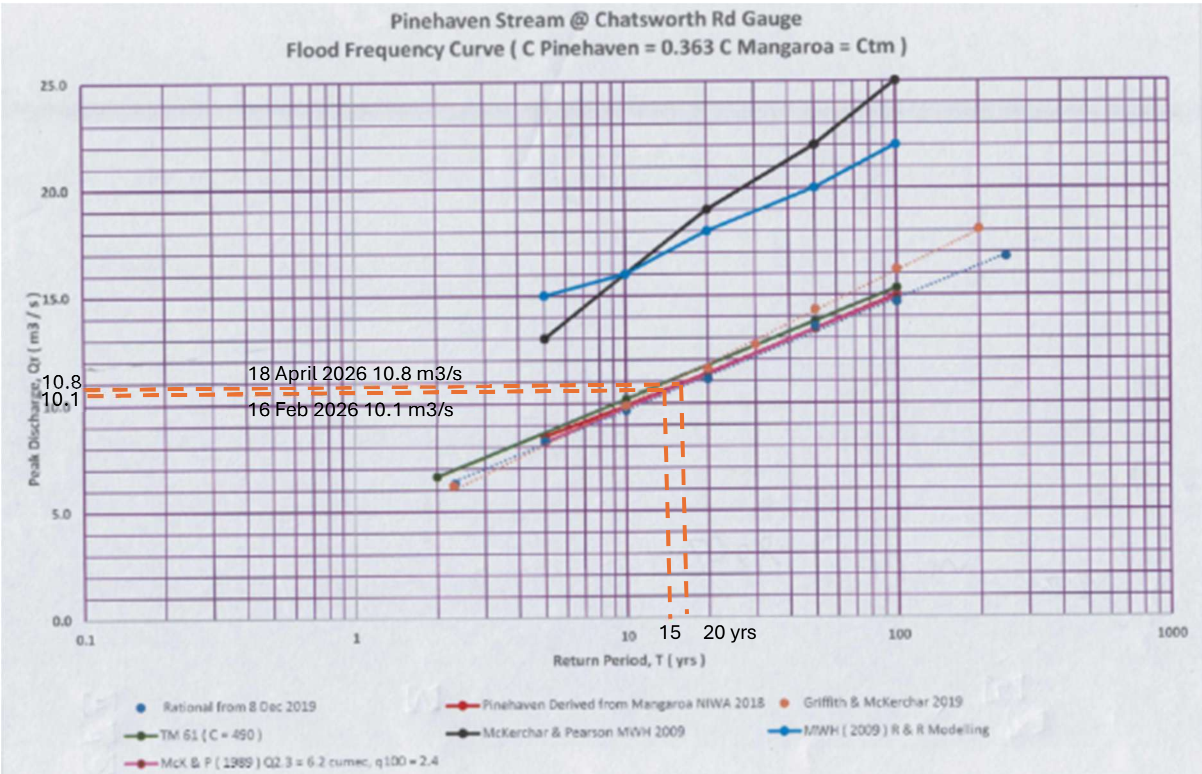


Figure 106 Pinehaven Stream catchment - Flood Frequency Curve (R J Hall & Associates Ltd)

The estimated peak water level at the staff gauge on 18 April 2026 was about 1.46m at around 9:30am. On the R J Hall & Assoc. Ltd rating curve 1.46m depth is about 10.8m^3/s. On RJ Hall & Assoc. Ltd Flood Frequency Curve, a flow of 10.8m^3/s is between a 1-in-15 to 1-in-20-year flood.

6. New Stream Gauge at Sunbrae Drive

The original stream gauge was located at the second railway iron from the footbridge that supports the timber retaining wall on the true right bank of the stream channel. The gauge was located here from 2008 to 2013. This location allows stream flow depths of current events to be related to historical records for Pinehaven Stream at this location.

Figure 107 Location at 4-8 Blue Mountains Road (Reformed Church, Silverstream) of the original stream gauge in Pinehaven Stream

This aerial view (left) is of the new stream gauge site just upstream of the new Sunbrae Drive culvert. The new gauge site was set up by GWRC either late 2025 or early 2026.

This aerial view shows that just a couple of metres downstream of the new stream gauge are two rock piles, one at the true left bank and one at the true right bank. These rock piles have since swept away.

Figure 108 New stream gauge site

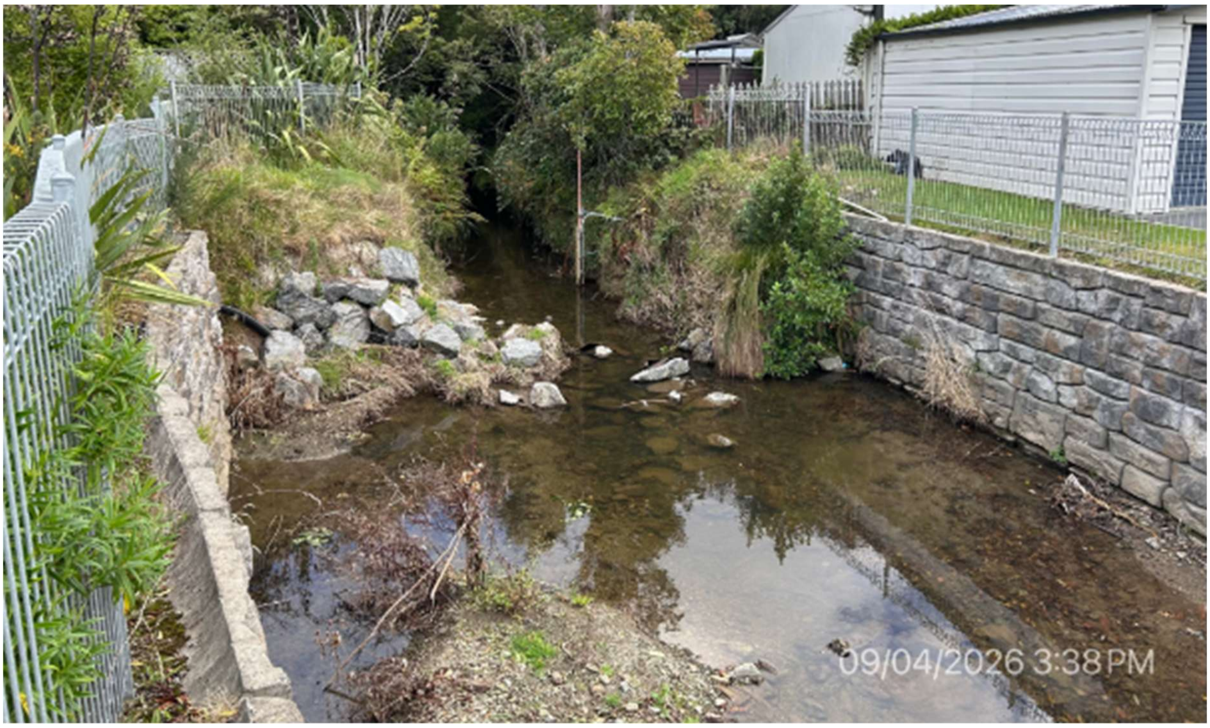


Figure 109 The rock pile on the True Left Bank was swept away in the 16 February 2026 event

Figure 110 The rock pile on the True Right Bank was swept away in the 18 April 2026 event

The disturbances to stream flow created by the rock piles being swept away in the 16 February and 18 April 2026 storm events may result in unreliable readings on the nearby stream gauge.

In addition to issues with unstable rock piles, the new stream gauge does not appear to be providing a reading of the depth of water from the bed of the stream channel but rather from a height of about 270mm above the bed of the channel.

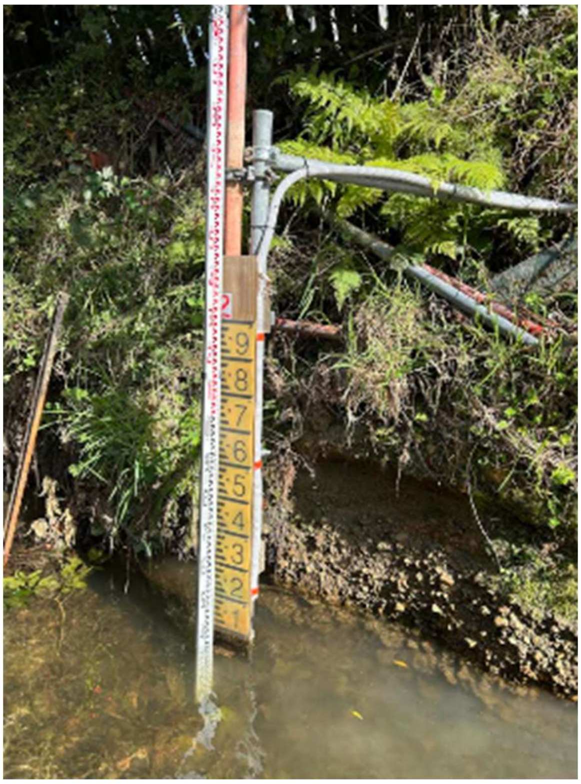


Figure 111 Survey staff shows zero on stream gauge staff is 270mm above bed of the stream

The new stream gauge might not be providing reliable stream level data because the gauge is located about 270mm above the stream bed.

We suggest that more reliable stream level readings can be made at the original gauge site. It appears to be more stable than the new site, and new readings at the original site can be related to several years of historical records taken at the original site from 2008 to 2013, together with observations from 8 December 2019 and 16 February 2026 storm events.

7. Conclusion

The 18 April 2026 storm should be treated as a warning.

It was not an extreme flood on the scale of the 1976 event. It was an estimated 1-in-15 to 1-in-20-year flood. Yet it produced rapid dirty-water flooding, blocked culverts, gravel and rocks in stream channels, significant sediment movement, stream-bank scour, and a large debris dam in the upper Pinehaven Stream valley. These are not minor inconveniences. They are signs of a catchment under stress.

This report has documented what residents saw on the ground. Water came down quickly. It carried silt, gravel, rocks, wood and debris. Culverts and channels that should have conveyed water became blocked or overwhelmed. Floodwater was diverted onto roads and into private property. Some residents who have lived in Pinehaven for many years said they had not seen this kind of debris movement before the 2026 storms.

The February and April 2026 events also fit a wider pattern. Pinehaven and Silverstream sit below steep hillside land where forestry clearance, tracks, exposed soil, slips, stream-bank erosion and future development all have the potential to change runoff behaviour. The concern is not simply that forestry occurs on the hills. The concern is that disturbed steep land above residential areas can export hazard downstream: water, sediment, slash, gravel, rocks and debris move down gullies and stream channels into culverts, pipes, roads and homes.

That hazard was foreseeable. The 1976 flood history, the 2018 warnings by Save Our Hills, the 2019 slip above 136A Pinehaven Road, the February 2026 Silverstream landslide, the repeated flooding and debris at 125 Pinehaven Road, and the debris dam in the upper Pinehaven Stream valley all point in the same direction. These are not isolated events. They are examples of a known hillside-runoff, sediment, debris and landslide pathway.

The institutional response has not matched the risk. Too often, the problem is divided into separate administrative boxes: private-property drainage, public stormwater, flood management, forestry regulation, district planning, regional compliance, and national forestry rules. But the catchment does not work that way. Water and debris move downhill as one connected system. If agencies divide responsibility while the hazard remains connected, the downstream community is left exposed.

The 18 April flood also confirms a separate but related problem: the official Pinehaven flood model does not match observed flooding. GWRC's 1-in-10-year flood map shows Pinehaven Reserve and surrounding areas as flooded. Yet Pinehaven Reserve did not flood on 18 April 2026, just as it did not flood during the 8 December 2019 and 16 February 2026 events. In all three events, the mapped flooding did not happen in key areas even though the observed floods were all larger than a 1-in-10-year event.

That matters because the model is not just a map. It is the baseline for future decisions.

If the baseline model exaggerates existing runoff and existing flooding, then it can make future development look less damaging than it really is. If the model already assumes that forested hills behave more like developed land, and that upper stream channels are already clogged or heavily obstructed, then future development can be compared against an already-damaged version of the catchment. That defeats the purpose of hydraulic neutrality.

Hydraulic neutrality is supposed to protect downstream communities. It should mean that development does not increase flood risk, runoff speed, runoff volume, sediment movement, erosion, debris blockages or landslide risk downstream. But hydraulic neutrality cannot be tested honestly against an inflated baseline. If the damage is already built into the model, the real-world increase from development can be hidden.

That is the central conclusion of this report.

The official model appears to have anticipated the future problem in the wrong way. It has not protected the community by preventing the problem. It has built the problem into the baseline. The result is dangerous: future development may be approved as “neutral” even if it increases the very risks now being observed on the ground.

If GTC’s proposed hillside development proceeds against the existing inflated baseline, Pinehaven and Silverstream may face more runoff, more erosion, more sediment, more debris, more blocked culverts, more landslide risk and more flooding downstream. The official maps may then become a self-fulfilling prophecy.

What is currently exaggerated in the model may become real if the model is used to approve development without requiring proper mitigation first.

The response should now be practical, urgent and independent.

The debris dam in the upper Pinehaven Stream valley should be removed and the debris-trap and pipe-intake system properly assessed. The 108A Wyndham Road culvert, 122 Pinehaven Road culvert and isolated Jocelyn Crescent road sumps should be fixed or upgraded. GTC’s forestry activity should be investigated for runoff, sediment, slash, debris and landslide risk. Further forestry clearance, roading or development on steep hillside land above Pinehaven and Silverstream should not proceed without enforceable controls that protect downstream residents.

Most importantly, the Pinehaven flood model must be independently reviewed and corrected now. It should be recalibrated against the real flood observations from 8 December 2019, 16 February 2026 and 18 April 2026. It should distinguish properly between the existing forested catchment and future urban development. It should represent the real condition of upper catchment stream channels, culverts and drainage structures. It should then be used to reassess the flood maps, the Pinehaven Stream Improvements project, and any claim of hydraulic neutrality for GTC’s proposed development.

Waiting until after development approval, after further hillside works, or after further streamworks would defeat the purpose of flood-risk assessment: the model must be fixed before decisions are made, not after the consequences are locked in.

The 18 April 2026 storm has given Pinehaven and Silverstream another warning. The question now is whether councils, regulators and decision-makers will act on that warning, or whether they will continue to rely on a baseline model that may hide the real risk until the damage has already been done.

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