Flooding Us — Why We Wrote This Book

The Story Behind the Pinehaven Flood Model

Most people do not spend years of their lives studying flood models.

We did not set out to do that either.

We were ordinary residents trying to understand why official flood maps for Pinehaven and Silverstream seemed so wrong, and why those maps were being used to justify expensive public works, restrict properties, and support major development on the hills above our homes.

What began as a simple question became a twelve-year journey through technical reports, public meetings, engineering drawings, Official Information Act releases, site surveys, historical records, flood photographs, spreadsheets, maps, and expert advice.

This book is the result of that journey.

It is not light reading. Flood modelling is unfamiliar to most people. It involves technical language, numbers, diagrams, maps and assumptions hidden inside complex reports. But what is at stake is not technical at all.

What is at stake is **human safety, homes, insurance, property values, public money, and trust in local government**.

That is why this book matters.

It Began With One Result That Made No Sense

Our concern started with what is called the **"future case scenario" (Chapter 1).**

Greater Wellington Regional Council (GWRC) had a large housing development scenario by the Guildford Timber Company (GTC) modelled on GTC's pine-forested hills above Pinehaven. It assumed about **1,665 residential lots across 125 hectares**, roughly the size of **Pinehaven and Silverstream combined**, or about **Wellington Airport and Wellington Zoo combined**.

Any ordinary person would ask the obvious question:

If you replace pine forest with roads, roofs, driveways, retaining walls and hard surfaces over an area that large, wouldn't there be much more runoff and flooding downstream?

Yet, without any management of stormwater from the development, GWRC reported that the modelling for the "future case scenario" showed **little or no increase in flooding**.

That result simply did not make sense.

It raised a deeper question:

Was the current baseline flood model already exaggerated, and already treating the hills as if development was there?

That question became the thread that runs through this entire book.

Then Residents Told Us Something Else That Didn't Make Sense

Long-time residents remembered the great flood of **20 December 1976**.

It was one of the most severe storms ever to hit the Hutt Valley and Wellington. Houses flooded. Roads were damaged. There were lots of landslides. It became part of local memory.

Yet when Greater Wellington later released Pinehaven's official **100-year flood maps**, many residents said those maps showed flooding **far greater than 1976**.

That did not make sense either.

Why?

Because after 1976, major drainage improvements were made in the Pinehaven catchment:

- new stormwater pipes
- detention works
- bypass systems
- upgraded culverts
- inlet protection works

How could a later modelled 100-year flood be much worse than the massive 1976 event **after** all those improvements?

That concern is explored in **Chapter 2**.

So We Investigated It Ourselves

We were told to trust the experts.

But when explanations did not stack up, residents began doing what communities often do when they feel unheard: we gathered evidence ourselves.

We surveyed stream channels at **five locations** around Pinehaven and Silverstream.

Using the channel sizes, surrounding landform, and the water depths shown on the official flood maps, we were able to estimate how much water the maps were actually depicting.

Then we obtained Greater Wellington's own spreadsheet data showing how much flow they said would be present at those same locations in a 100-year flood.

The result was startling.

At all five locations, the flood maps appeared to contain **three to six times more water** than Greater Wellington's own calculated flows.

These became known as the Save Our Hills **case studies**.

Those findings are set out in **Chapter 2**.

The Community Asked for an Independent Audit

By then, many residents had lost confidence in the flood maps.

People made submissions asking for an independent review.

Eventually Greater Wellington engaged **Beca** to carry out a flood mapping audit.

We fought hard just to get the community's main concerns into the Terms of Reference:

1. Why did a huge development on the hills supposedly make little difference to flooding?
2. Why did the flood maps appear to contain far more water than Council's own calculations?
3. Why were current baseline flows not being published, so future development on the hills could be transparently assessed for the extra runoff it would cause?

These were not trivial concerns.

They went to the heart of whether the flood model could be trusted.

The Audit Did Not Resolve the Real Issues

Chapter 3 explains why the audit did not restore confidence.

Instead of properly addressing the concerns, key issues were dismissed.

Later documents released under the Official Information Act were even more troubling.

They showed that the reason the large GTC "future case scenario" development made little or no difference to flooding was because the **same rainfall-loss assumptions** had been used for both the forested baseline and the development scenario.

In plain English:

The baseline model was already treating forested hills like urban development.

Independent reviewers later described the forested hills as being modelled as **exceptionally impervious**.

If that is correct, then today's model is not representing today's catchment.

It is already embedding tomorrow's GTC development runoff into today's flood maps.

That is a fundamental problem.

Then Came a Real 25-Year Flood

On **8 December 2019**, a major flood occurred in Pinehaven.

This was a real-world test.

The storm was about a **25-year flood event**.

If the model was right, the mapped 25-year flood extents should broadly resemble what happened.

They did not.

Only a small number of properties flooded compared with the large areas shown flooded on the maps.

Even more revealing: much of the stream channel contained the flood without overtopping, despite claims that most of the channel had less than a five-year flow capacity.

That evidence is detailed in **Chapter 4**.

Yet despite occurring during consultation on the Pinehaven Stream Improvements project, and despite detailed information from the community about this flood (including independent expert analysis and reports), this flood was not used by GWRC to recalibrate the flood model.

Then Millions Were Spent on Works Based on the Model

The consequences were not theoretical.

They became concrete, steel, excavation, and debt.

The Pinehaven Stream Improvements, reportedly designed to provide flood protection for up to a 1-in-25-year flood event, was originally estimated at about **$10.7 million**.

After only part of the catchment was addressed, costs escalated to around **$61 million with no explanation or accountability for why the costs had escalated**.

One striking example was the Pinehaven Road culvert estimated at $1 million replacement cost.

The old culvert, still in good condition, did **not** overtop in the real 25-year flood of 2019.

Yet it was replaced with a much larger structure at a cost of around **$8 million**.

And even then, the works only benefit the **lower half of the catchment**.

Properties upstream of Pinehaven Reserve, including repeatedly affected homes, receive no flood protection benefit from the $61 million stream works.

That story is examined in **Chapter 5**.

How Could the Flood Maps Be So Large?

As we continued investigating, we learned more about modelling devices that can enlarge flood extents without readers realising it.

These include issues discussed in **Chapter 6**, such as:

- assumptions that effectively cancel out significant post-1976 drainage improvements
- roughness values that assume totally blocked stream channels
- double-counting blockage effects

- adding ‘freeboard’ as 300mm – 500mm extra floodwater depth, on top of puddles and shallow water only 2mm or 3mm deep
- mapping shallow nuisance water less than 100mm deep as flood hazard
- simplified one-colour flood maps that do not show what the inputs are that are driving the flood extents

To the public, the maps look authoritative.

But if the assumptions underneath are wrong, the maps can be seriously misleading.

Why This Became a Governance Issue

Over time we realised this was not just about hydrology.

It was about process and decision-making.

Many residents felt dismissed, ignored, or shut out.

Submissions opposing the maps were minimised.

Concerns about proposed GTC development on the hills were brushed aside.

Public forums often felt one-way.

Important decisions moved forward while core disputes remained unresolved.

That is why **Chapter 7** deals with consultation, accountability, and democratic trust.

Because when technical decisions affect homes, insurance, land use, and people’s safety, then process matters.

Why It Matters Now

This is no longer a historical dispute. Responsibility for water services in the Wellington region transfers from local councils to **Tiaki Wai MetroWater Ltd** on **1 July 2026.**

If a disputed and exaggerated flood model is carried forward uncorrected, the exaggerated flood maps will become the new reality with its consequences carried forward too:

- future flood risk from GTC development on the hills will be understated
- families will be exposed to danger from increased flooding and landslide risk
- properties upstream of Pinehaven Reserve will continue getting no flood protection
- unfair flood zoning wrongly showing properties in a flood zone will be retained
- insurance impacts will continue
- and costly flood works will be based on flawed assumptions

That is why timing matters.

What We Asked For

We did **not** ask to stop GTC's development on the hills.

We asked for something much more reasonable:

Fix the baseline flood model first.

Chapter 8 proposed a practical **Reset Strategy**:

- independent review of the flood model
- transparent rebuilding of the baseline model
- testing against real floods
- proper stream gauging
- genuine community engagement
- public reporting of findings
- transparency and accountability of public expenditure on flood protection works

That reset has not been adopted.

Instead, decision-making behind closed doors in public-excluded meetings has continued.

Why Read This Book?

Because no short summary can fully show the evidence.

This book contains the documents, maps, calculations, eyewitness accounts, photographs, engineering contradictions, official correspondence, and expert opinions that explain how we reached these conclusions.

We know it asks effort from the reader.

It took enormous effort to assemble.

But if you care about:

- whether public authorities can be challenged with evidence
- whether communities are heard
- whether homes and families are protected
- whether public money is wisely spent
- whether development is based on truth rather than distortion

...then this story is worth your time.

What Must Happen Now

Do not rely on a disputed flood model when human lives and homes are at stake.

The Pinehaven flood model must be independently fixed now, so the community is not left exposed to increased flood and landslide risk from future development on the hills.

Read the book.

Examine the evidence for yourself.

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Community knowledge matters. Many of the most important facts in this story came from residents who cared enough to speak up.
