Modelling Group
WATER NEW ZEALAND

Modelling Symposium

# Allowing Infill Subdivision on Floodplain and Implications of RMA

Presented by
Ivan Kholodov

water NEW ZEALAND
The New Zealand Water & Wastes Association Waiora Aotearoa

# Evolution of Modelling Advice

RE: 39 - 41 Hinau st - Tawa

RE: Confidential Resource Consent Pre-application Meeting Request, 39 Porritt Ave SR 447003

RE: 23 Findlay Street - Tawa

RE: [SPF: Suspicious Sender] 13 Roy Street Newtown

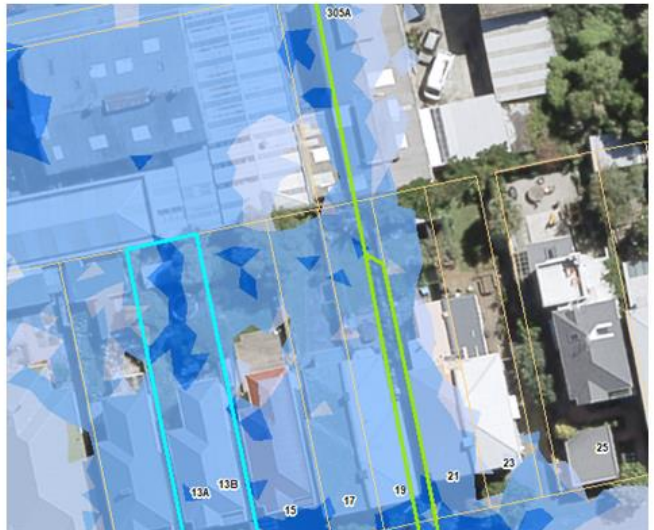
Reply | Reply All

Ivan Kholodov
To Land Development
Cc Rhyann McCoy
Retention Policy All (7 years) Expires 19/11/2026
You forwarded this message on 22/11/2019 12:33 pm.

Hi Sarah

We have draft model results from our Southern CBD model for a 1% AEP event including climate change. These results predict that the area of Newton where the property is located would be flooded to a level of 3.6 m with maximum depths of up to 370 mm through the middle of the site approximatel extension would be located. Based on these results our recommended minimum floor level is 3.8 m aMSL (including 200mm of freeboard).

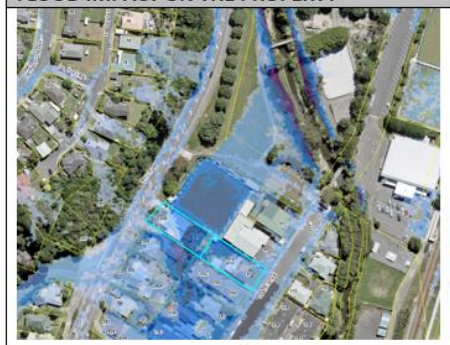
The direction of the flow is in parallel to the site boundary with flow speed of around 0.2 m/s. The proposed extension should not significantly affect the overland flow path with unlikely impact on the neighbouring properties.



# Evolution of Modelling Advice

| FLOODING RESULTS | |
|---|---|
| Vertical Datum | 1953 Wellington Circuit |
| Software | InfoWorks ICM |
| Model | Tawa |
| Model Status | Validated |
| Flood Scenario | 100 year ARI + Climate Change (assuming 2.1 C temperature increase) |
| Sea Water Level | 2.1 m |

**FLOOD IMPACT ON THE PROPERTY**




| | |
|---|---|
| Maximum Flood Depth | 700 mm |
| Maximum Water Level | 23.3 aMSL |
| Minimum Water Level | 21.7 aMSL |
| Overland Flow | 0.4 m/s |

| RECOMMENDATIONS | |
|---|---|
| Minimum Floor Level (m aMSL including 200 mm Free board) | Unknown where building is proposed. Based on Maximum water level minimum floor level would be 23.5 aMSL. |
| Overland Flow | Significant overland flow path is going through these properties. If development goes ahead we would recommend building on piles at this location to avoid abstraction of the overland flow path. |

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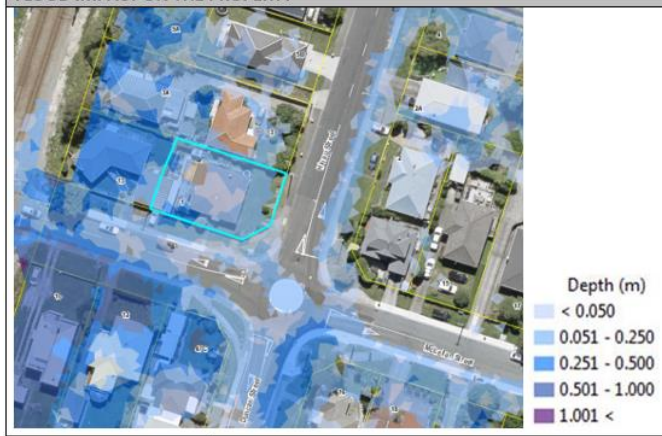



| | |
|---|---|
| Maximum Flood Depth | 400 mm |
| Maximum Water Level | 20.3 m aMSL |
| Minimum Water Level | N/A |
| Overland Flow | 0.2 m/s |

| RECOMMENDATIONS | |
|---|---|
| Minimum Floor Level (including 200 mm Free board) | 20.5 m aMSL |
| Overland Flow | Major flow path. We recommend that any structure at this location is built on piles. |

# Evolution of Modelling Advice

**Recommended Floor Levels**

84 Moxham Avenue, Hataitai, Wellington, 6021

Results:1

### Property Assessment for 84 Moxham Avenue, Hataitai, Wellington

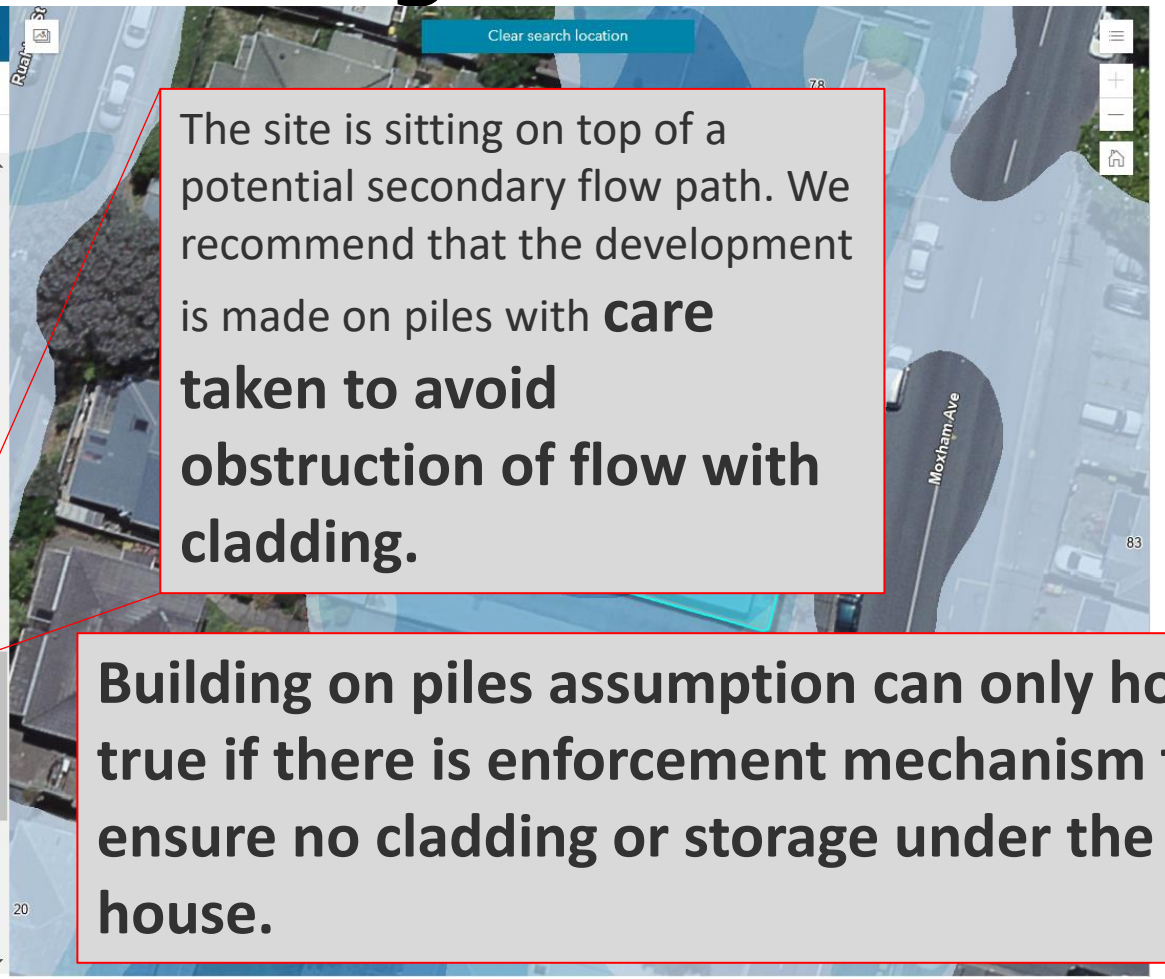
**Property Recommendation** - *Would Benefit from detailed assessment if development details are available*

Recommended levels are provided below - this includes either a recommended floor level or a floor height. It is up to the applicant to choose whichever method suits them better. Minimum floor height/level provided is quoted to the underside of the concrete slab or floor timber joist.

| | |
|---|---|
| Flooding Status | Potential flood hazard (>50 mm) |
| Recommended Minimum Floor Level, including freeboard (m aMSL) | 17.7 |
| Recommended Minimum Floor Height, including freeboard (m) | 1.2 |
| Freeboard (m) | 0.2 |
| Potential Overland Flowpath Constraint | The site is sitting on top of a potential secondary flow path. We recommend that the development is made on piles with care taken to avoid obstruction of flow with cladding. |

**Flooding Details**

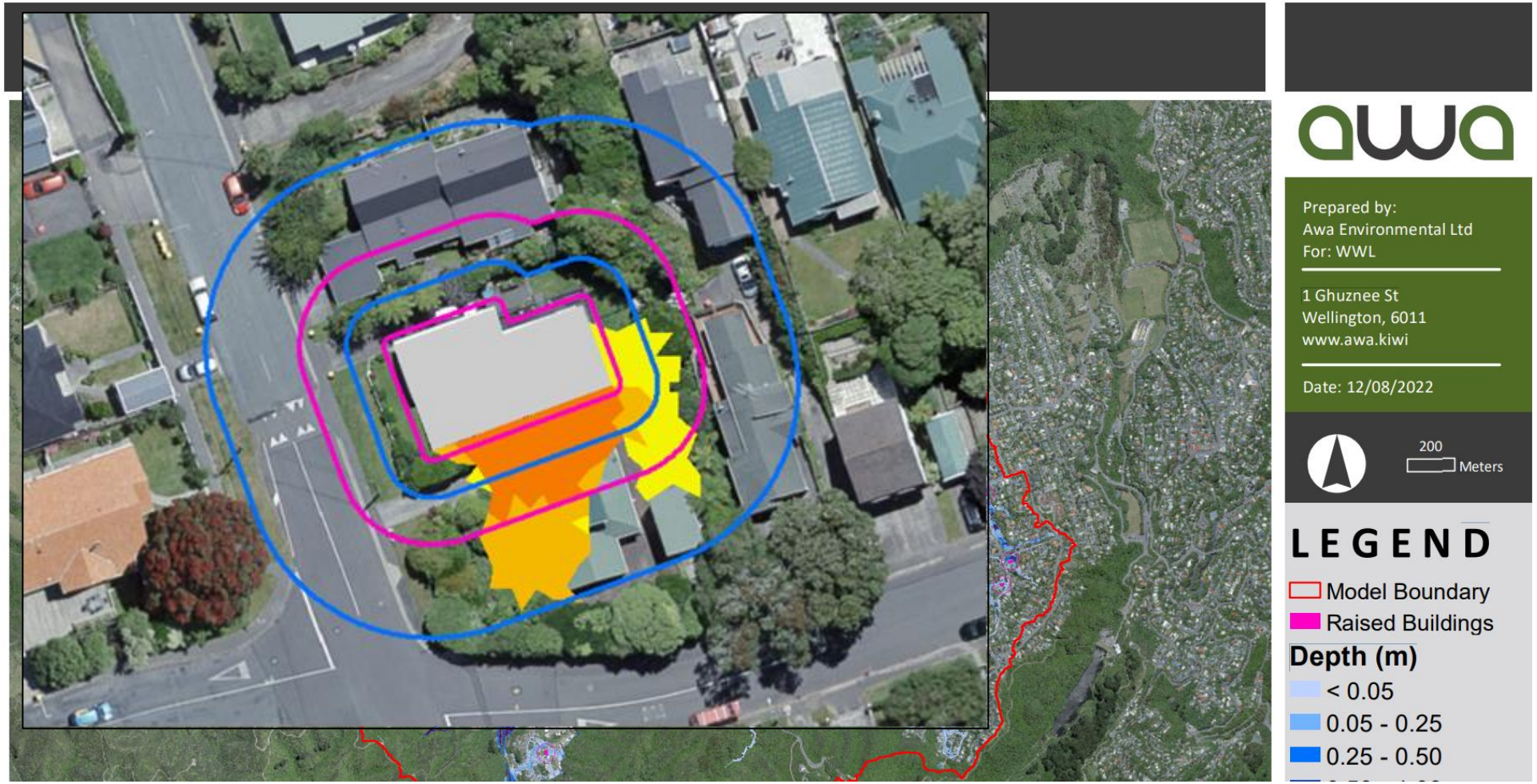
| | |
|---|---|
| Maximum Depth (m) | 1.0 |
| Minimum Depth (m) | 0.1 |
| Maximum Water Level (m aMSL) | 17.5 |
| Minimum Water Level (m aMSL) | 17.4 |
| Maximum Speed (m/s) | 0.4 |
| Minimum Speed (m/s) | 0.1 |




The site is sitting on top of a potential secondary flow path. We recommend that the development is made on piles with **care taken to avoid obstruction of flow with cladding.**

**Building on piles assumption can only hold true if there is enforcement mechanism to ensure no cladding or storage under the house.**

# Is 0.2 m/s rule of thumb realistic?



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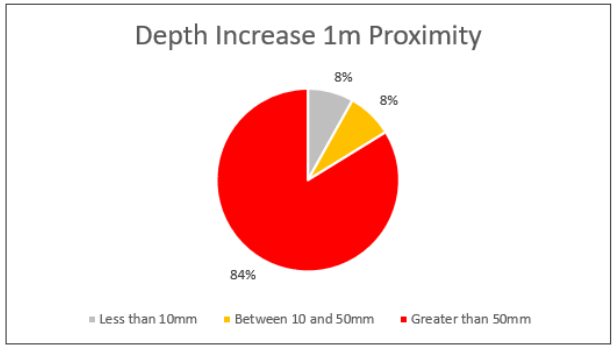
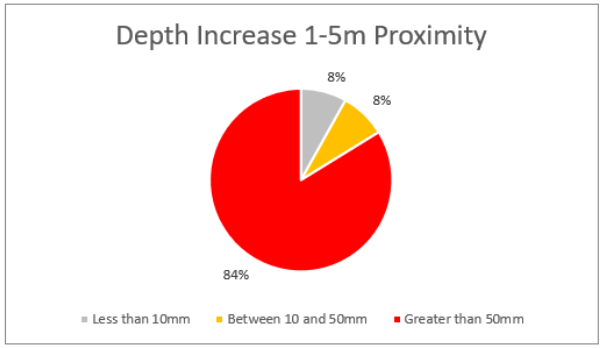
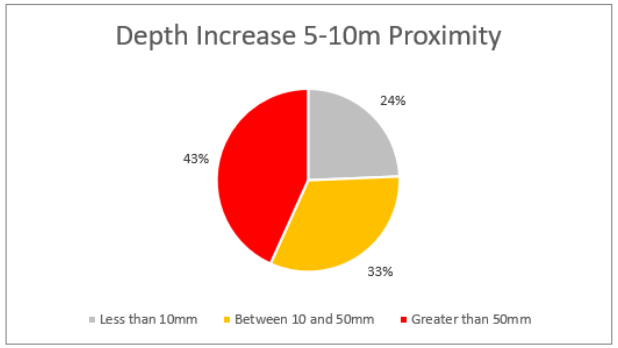
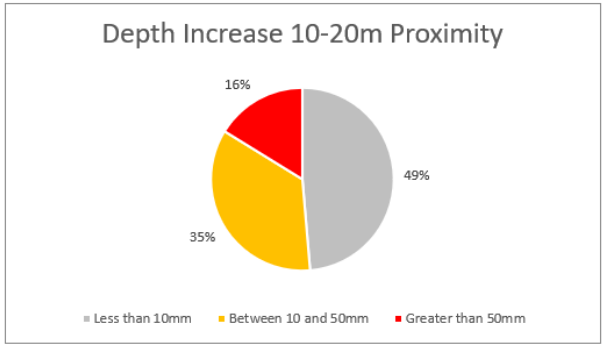
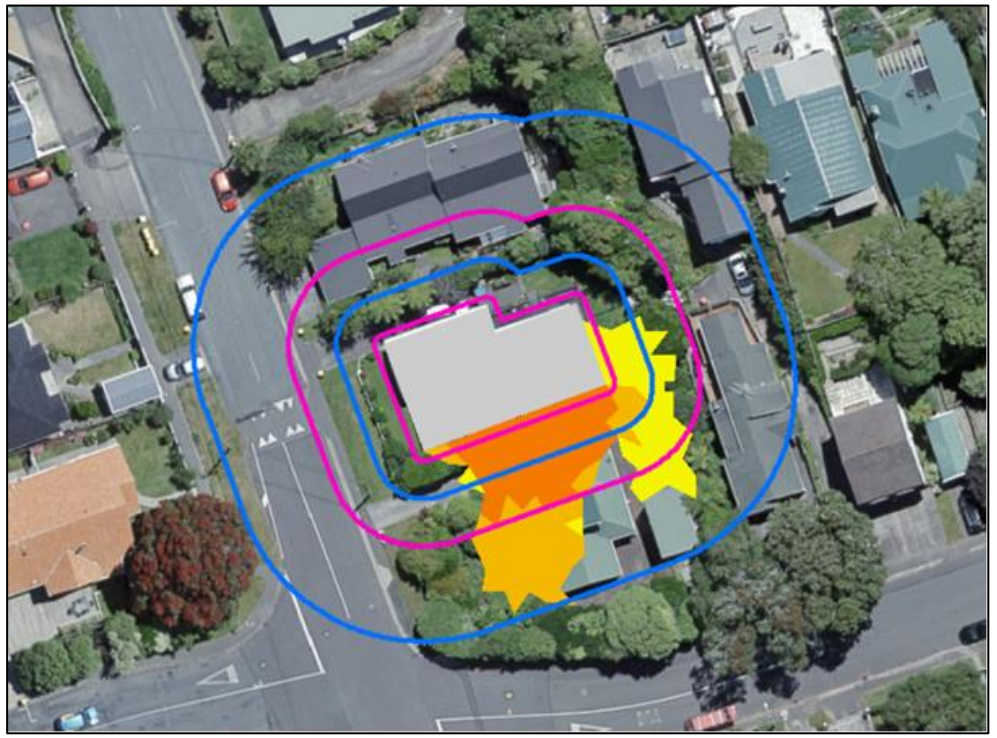


No it is not realistic and we must not apply it!

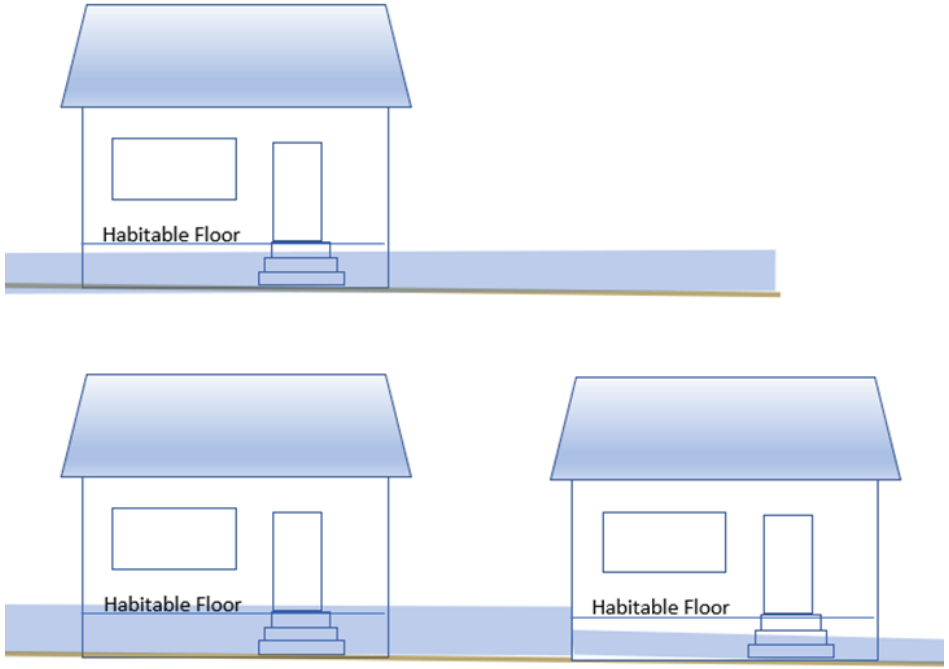
# Building Code Requirements

E1.3.1
Except as otherwise required under the Resource Management Act 1991 for the protection of other property, surface water, resulting from an event having a 10% probability of occurring annually and which is collected or concentrated by buildings or sitework, shall be disposed of in a way that avoids the likelihood of damage or nuisance to other property.
E1.3.2
Surface water, resulting from an event having a 2% probability of occurring annually, shall not enter buildings.

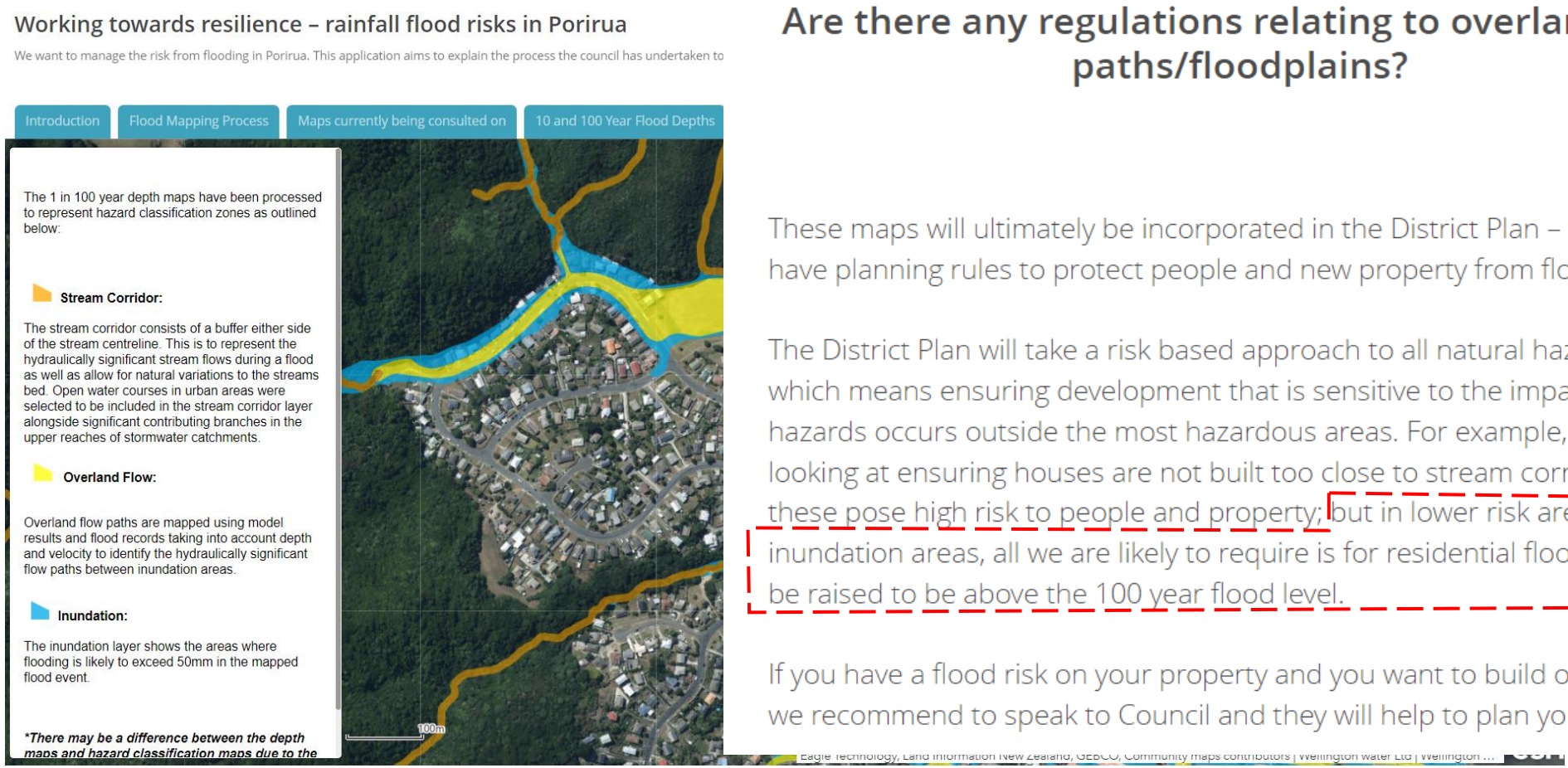
# RMA Requirements

According to RMA, territorial authorities are to implement and administer district plans to:

- ensure that there is sufficient development capacity in respect of housing and business land to meet the expected demands;
- control of any actual or potential effects of the use and development of land for purposes of avoidance or mitigation of natural hazards and prevention or mitigation of any adverse effects of the development, or subdivision.



# So what did PCC adopt?




## Are there any regulations relating to overland flow paths/floodplains?

These maps will ultimately be incorporated in the District Plan – which will have planning rules to protect people and new property from flood risks.

The District Plan will take a risk based approach to all natural hazards, which means ensuring development that is sensitive to the impacts of hazards occurs outside the most hazardous areas. For example, we are looking at ensuring houses are not built too close to stream corridors as these pose high risk to people and property; but in lower risk areas such as inundation areas, all we are likely to require is for residential floor levels to be raised to be above the 100 year flood level.

If you have a flood risk on your property and you want to build or subdivide we recommend to speak to Council and they will help to plan your work.

# Maybe adopt PCC philosophy?


| Flood | NoProperties | %StokesValley Houses |
|---|---|---|
| 100 yr | 2130 | 37 |
| 10 yr | 1151 | 20 |
| OLFPs | 890 | 16 |

# Conclusions

- Not all rules are sacred !
- Made assumptions are not always realistic !
- Adopted philosophy must occasionally, be put to a challenge

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# Thank you!
# Questions? Patai?

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