

Maitai River Flood Hazard

The Maitai River is prone to regular flooding, especially when heavy rain coincides with a big tide. There are many historical records of the Maitai river breaching its banks and flooding onto the floodplains, river terraces, roadways and private property, occasionally with disastrous consequences.

This flood hazard is predicted to get worse due to a combination of factors relating to climate change such as more severe and more frequent rain events and sea level rise.

Increases in the areas of impervious surfaces, loss of vegetation and filling of the floodplain, such as is proposed for the Kaka valley will inevitably increase the volume and rate of stormwater, further increasing the flood hazard for many downstream properties including those in the Nelson Urban and Commercial areas.

The PPC28 Latest Structure Plan as well as the Tonkin and Taylor Stormwater Management Plan confirm the intention to fill and raise a significant area of the Maitai/Kaka Valley Active floodplain that currently lies below the 1% AEP level.

Insufficient evidence and inadequate modelling has been presented to properly assess the potential increased flood hazard on downstream properties.

Previously there was an implied intention to maintain Neutral Floodplain Storage Capacity (see p 67 of PPC28 Private Plan Change Request submitted on August 28, 2021 where it states that,

'...careful consideration has also been given keeping the floodplain storage capacity neutral. The primary method to achieve this neutrality has been to lower part of the flood plain and balance that against the filling of the development area, as described in section 5.3.1 (p10) of the Infrastructure and Flooding Report (Attachment C7)'.

However in the latest Stormwater Management Plan submitted by Tonkin and Taylor on June 15th 2022, it is no longer clear if or how floodplain storage capacity neutrality will be maintained.

On page 45 of this Stormwater Management report it states the following:

5.8 Flood management

The proposed development has the potential to affect existing flood hazard in various ways, including:

- *A net reduction in perviousness across the catchment leading to increased runoff (higher flows during rainfall events that could cause increased flooding within and downstream of the PPC28 area);*
- **Loss of flood storage** *within the flood plain due to earthworks encroachment (particularly in the Maitahi/Mahitahi River flood plain, where a fill platform is proposed);*
- *Changes to overland flow paths resulting from building platforms and new road alignments;*
- *Concentration of fewer overland flow paths;*
- *Possible coincident timing of peak flood flows.*

The report then specifically highlights the potential increased flood hazard due to loss of flood plain storage:

5.8.1 Filling within the Maitahi/Mahitahi River flood plain

*The applicant proposes filling within the Maitahi/Mahitahi River flood plain within the PPC28 area, and realignment of the Kākā Stream. The **loss of flood plain storage** could displace and redirect floodwaters during an extreme event, causing adverse flooding effects on adjacent and/or downstream property.*

The Report then details how these potential flood risks are to be mitigated, and on page 46 specifies that the modelling used is based on the revised earthworks plan, the proposed details for the realignment of Kaka stream and the predicted increases in run-off post development:

The TUFLOW direct rainfall model was also used to clarify flooding in the post-development scenario.

The model is based on:

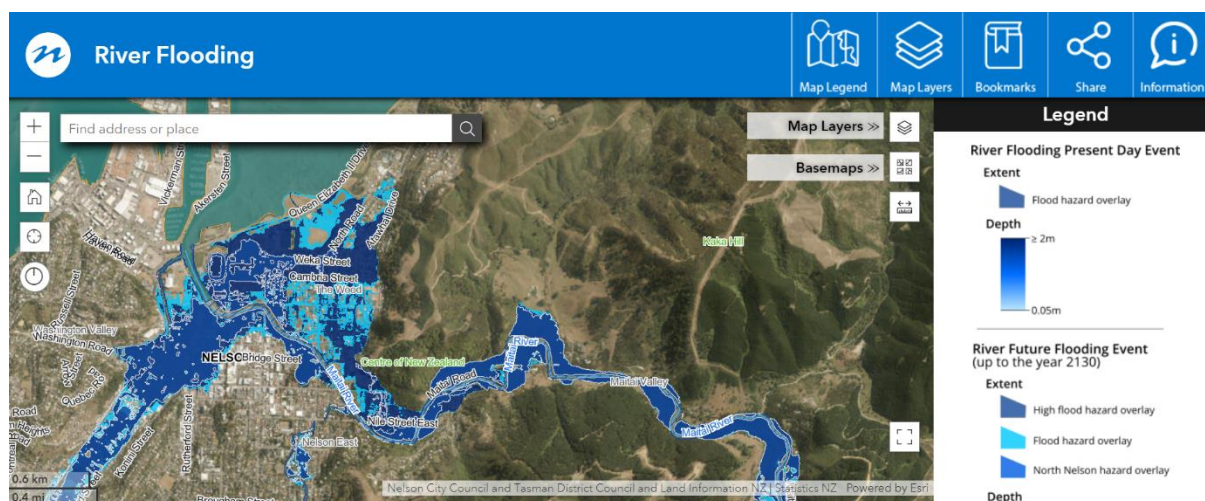
- The revised earthworks footprint
- Realigned Kākā Stream watercourse (refer Section 5.7.1 below for realignment details);
- Runoff from the modified post-development catchment (assuming NO attenuation – in reality, these flows would be routed through attenuation devices).

It is unclear if the flood modelling has taken into account how the **narrowing of the Maitai/Kaka floodplain** and **loss of floodplain storage** will impact the flood waters of the Maitai river, and appears to only consider the impact from stormwater generated within the proposed development area, conveyed predominantly via Kaka stream. Logically these factors will likely accelerate and raise the Maitai River floodwaters and potentially pose an unacceptable increased flood hazard to downstream property.

This risk needs to be properly assessed at the Plan Change stage particularly as it could be ignored at a Resource Consent phase where a 'whole catchment' approach will not necessarily be considered.

Flood Map - Nelson

The following image from Shape Nelson illustrates the extent of areas prone to flooding – for 2130. Note this includes a significant portion of the Maitai/Kaka Valley floodplain that has been earmarked for filling for the proposed PPC28 development.



Historical Flood Photographs

The following are a collection of historical photographs illustrating the Maitai River's flood hazard. These illustrate that any increase to the flood hazard due to the proposed development should not be acceptable.

1. December 2011 – Flooding near Domett street.



Disastrous floods hit Nelson – Nelson Photo News – no 119 – September 1970

https://photonews.org.nz/nelson/issue/NPN119_19700919/t1-body-d18.html



September 1970 – Photo from Maitai Valley rd/Nile st.



ABOVE—The Maitai River in full flood late afternoon Monday. The picture was taken from the Maitai Valley road just above the Nile Street bridge and across river.
BELOW—Further up the valley, just past the Maitai Run homestead, paddocks on the run were showing the effects of gouging very much later in the week.

December 1939 – Flood Milton/Grove Street.

