Memo

To:	Joanne Walton	**Job No:**	1098217.0000
From:	Lexy Bassett	**Date:**	6 November 2026
cc:	Miriam Tailby, Jon Rix		
Subject:	Flood mapping of CDM model results		

This memo outlines the methodology carried out by Tonkin & Taylor (T+T) to develop a floodplain map for Taupō District Council based on flood model results provided to T+T.

CDM Consulting Ltd (CDM) developed flood models across the Taupō District, and raw (unprocessed) model results were provided to Taupō District Council. T+T have been engaged to post-process the model results to create floodplain extents that TDC can make publicly available on their GIS system (Mapi).

T+T did not undertake the hydraulic modelling and has relied on the model outputs supplied by CDM as the basis for this assessment.

1 Model result data

1.1 Spatial extents

The supplied model results cover the following areas:

- Acacia Bay
- Broadlands
- Hatepe
- Kinloch
- Kuratau & Omori
- Mangakino
- Motuoapa
- Nukuhau
- Taupō
- Tauranga Taupō
- Tokaanu
- Turangi
- Waihi
- Waitahanui
- Whakamaru
- Whareroa

1.2 Modelled scenario

The flood model results provide depth, level and velocity information for 10 year ARI[1] scenarios, 50 year ARI and 100 year ARI scenarios.

In agreement with TDC, flood mapping was carried out using only the 100 year ARI scenario. A 100 year ARI scenario was available for twelve of the sixteen areas. There is some uncertainty* regarding the model results for the following four locations:

- Broadlands
- Hatepe
- Mangakino
- Taupō

[1] Average Recurrence Interval (ARI). A 100 year ARI scenario has an approximate annual exceedance probability (AEP) of 1%.

**The uncertainty for these four locations results from discrepancies between the event naming within the model output folder and the event attributes contained within the model result file. The result file attributes indicate that the result is indicative of a 50 year ARI scenario although the result is stored in a folder indicating that it is a 100 year ARI result.*

TDC and T+T are unable to resolve whether the scenario represents a 50 year ARI or 100 year ARI without further support from CDM Consultants. In the absence of further information, it is recommended that the model results at the four aforementioned areas are assumed to represent 50 year ARI scenario.

1.3 Climate change

The flood model results do not indicate whether an allowance for climate change has been adopted. TDC and T+T are unable to resolve this without further support from CDM Consultants.

2 Flood mapping methodology

This section describes the high-level methodology to convert model results to floodplain extents. Flood depth, level and velocity information is available, but not presented in the floodplain layer.

The maxima flood depth information was used to derive the floodplain, and adjusted as follows to reduce the model "noise" and reflect likely floodplains that are easier to interpret:

- Show extents for depths greater than or equal to 100 mm.
- Remove 'islands' (isolated areas of flood extents) that are less than 100 m^2.

This approach is consistent with the National Stormwater Modelling Guide (Water New Zealand, 2024). A review of mapping approaches and guidance/specifications from other councils around the country indicated that each council tends to generally follow similar approaches with minimum cut off depths of 50 mm to 100 mm.

The following post processing methods are also common (Water New Zealand, 2024) although they have not been carried out:

- Show flood depths greater than or equal to a set minimum depth: 50 mm ~~or 100 mm~~ are often used as a cutoff.
- Removal of 'holes'[2] ~~and 'islands'~~ from the extent that are less than a set minimum area: 100 m^2 is often used as a cutoff.
- Remove extents that are isolated from public land.

3 Deliverables

The outputs from this exercise that have been shared to Taupō District Council comprise:

- ESRI Open Geodatabase file comprising the flood extents for each of the sixteen areas.

4 Reference

- Water New Zealand; 2024. National Stormwater Modelling Guide. V1.0. April 2024.

[2] "Holes" are small areas that are surrounded by floodwaters, and often located in areas of uncertainty in the underlying topography, for example underneath a building.