

The information below is an extract from the report: Hawke's Bay Regional Council, 2018. Tangoio Marae Proposed Stopbank Hydrodynamic Analysis.

## Classification of the four major floods in Tangoio Valley in the past 100 years

We recommend reviewing the report 3794 AM0516 TeNgaru Catchment Flood Hazard Study. This report provides the details of many floods that have happened in the Tangoio Valley. The following table summarises the rainfall from many past events.

Year	Month	Rainfall Totals (mm)			Comments	
		Short Duration	1 day	2 day		3 day
1924	March 11	200 mm in 3 hours	380			
1938	April 24	300 mm in 14 hours	324.0	535.0	610.5	Esk Valley Flood
1954	July 3		201.2	286.5	316.2	Wet catchment
1955	March 11		200.7	304.1	336.4	Dry Catchment
1956	July 14	241 mm in 15 hours	241.0	278.9	318.8	0.4 m silt deposits
1963	June 4	365 mm in 15 hours*	194.8	310.1	338.5	
1968	June 22		199.6	225.5	230.1	
1973	June 14		183.5	249.0	251.5	
1977	April 16		234.6	319.6	323.6	
1985	March 14		205.3	274.7	287.0	
1985	July 26		187.5	283.5	357	
1987	March 27		237.3	256.2	257.5	
1988	March 7		223.0	424.7	612.9	Cyclone Bola
1988	Sept. 2		210.5	231	231	
1996	Jan. 27		218.8	273.3	334.6	

\*unofficial record from D. Mckay of Flatrock Station

The idea to understand the severity of these floods is to compare these with the design 100 year flood rainfall and discharge is an important concept. Unfortunately, the comparison of measured flood discharge is impossible, since no measurements of the discharges took place. The duration of the event is also an important consideration. A short, sharp peak may be higher in discharge, but cause less damage than a longer sustained lower peak. Rainfall was recorded for these severe events but is generally a poor indicator of the flood flows, due to the variation in rainfall over the catchment. Despite this, an estimate of the relative severity of several events for comparative purposes can be made as follows:

1938 – 3 day rainfall same as Bola 1988. Shorter duration rainfall more severe, so this event was probably more severe than 1988. Severe siltation caused during this event from initial land clearance.

1956 – 1 day rainfall similar to Bola 1988, likely to have had similar short term impacts as Bola, but perhaps not the same larger scale, therefore, probably less severe than Bola.

1963 – 365 mm in 15 hours (at Flatrock Station) – this is very intense, and probably caused as much damage, or perhaps slightly more than Bola 1988.

1988 – Cyclone Bola, 600 mm rain over 3 days. This is well over the 100 year rainfall for 3 days, which is about 450 mm. As mentioned earlier, this does not mean the flood peak had a return period of 100 year because the intense rain did not fall over the entire catchment.

March 2018 – Esk Flood – 144 mm in 3 hours, and over 300 mm in 12 hours (at Glengarry). This recent event only caused minor flood issues in the Te Ngarue catchment, however,

much heavier rainfall occurred in the adjacent Pakuratahi catchment over the same period and is evidence of the extreme events that can occur and is a good reminder about the potential severity of rainfall.