

Ref: 311015-00610
File: lr311015-00610iw250131-Gorman Road
Planning Proposal.docxThe General Manager
Goulburn Mulwaree Council
184 Bourke Street
GOULBURN NSW 258019th February 2025**Attention: Ms Kate Wooll**

Dear Kate,

**GOULBURN OVERLAND FLOODING RISK STUDY & MANAGEMENT PLAN
158 GORMAN ROAD PLANNING PROPOSAL – OVERLAND FLOODING AFFECTATION OF ROADS****1. Background**

I refer to our fee proposal dated 17th January 2025 to provide additional information to support a planning proposal for a rural residential development at 158 Gorman Road (refer **Figure 1**). It is understood that the planning proposal aims to facilitate one additional lot with an area of about two hectares within the cleared portion of the site.

It is also understood that information on the overland flood affectation of Gorman Road is required in order to address concerns from the NSW State Emergency Service (SES) as well as the Department of Climate Change, Energy, the Environment and Water (DCCEEW). Gorman Road is the only access route between the property at 158 Gorman Road and Sydney Road to the south.

Worley Consulting is currently engaged by Council to undertake the Goulburn Overland Flooding Risk Study and Management Plan. As part of this project, Council has provided a copy of the flood models developed for the *Goulburn Overland Flow Modelling Report* (GRC Hydro, 2021).

Accordingly, Council has requested Worley Consulting to extract flood model results from the existing 2021 overland flow study to determine warning times and inundation duration at key points along Gorman Road (refer **Figure 2**).



Figure 1 Location of 158 Gorman Road

2. Methodology and Assumptions

Worley Consulting has completed the following tasks.

- Established the provided WBNM and TUFLOW flood models which were developed for the *Goulburn Overland Flow Modelling Report* (GRC Hydro, 2021).
- Utilised the existing flood models to simulate the critical duration storms for the 5% AEP event (2 hour and 9 hour storms), 1% AEP event (2 hour and 9 hour storms), the 1 in 2000 AEP event (1 hour and 6 hour storms) and the Probable Maximum Flood (1 hour storm). These critical durations were specified in Section 6.1 of the *Goulburn Overland Flow Modelling Report* (GRC Hydro, 2021).
- Extracted and tabulated available warning times and duration of inundation for the roads nominated by Council (refer **Figure 2**) for the seven design events nominated above.

The following items were assumed when extracting available warning times and duration of inundation.

- It was assumed that the models developed for the *Goulburn Overland Flow Modelling Report* (GRC Hydro, 2021) and which were provided by Council were suitable for the purposes of this analysis.
- It is understood that the flood models developed for the *Goulburn Overland Flow Modelling Report* (GRC Hydro, 2021) were completed using rainfall data and techniques from Australian Rainfall and Runoff 1987 (ARR 1987). Therefore, the outcomes of this analysis may be subject to change when the modelling is updated to Australian Rainfall and Runoff 2019 (ARR 2019) as part of the *Goulburn Overland Flooding Risk Study & Management Plan*.
- It is noted that the *Goulburn Overland Flow Modelling Report* (GRC Hydro, 2021) conducted a preliminary comparison of ARR 2019 and ARR 1987 rainfall data for the purposes of assessing overland flooding. The 2021 report recommended the adoption of ARR 1987 rainfall data and techniques as it achieved a closer match to the outcomes of an at-site rainfall intensity frequency analysis which was undertaken for the Bungonia (Inverary Park) gauge (gauge number 070012).
- Therefore, the adoption of ARR 1987 rainfall data and techniques for the purposes of assessing overland flooding of Gorman Road is considered appropriate.

3. Findings

The locations where warning time and duration of inundation are provided are shown in **Figure 2**. These locations were selected based on where the earliest or most severe inundation is expected.

Table 1 documents the available warning time and duration of inundation for Gorman Road for the seven nominated design events. The available warning time refers to the length of time from the onset of rainfall to the time when floodwaters first inundate the road.

I trust that the findings documented above suitably addresses the requirements to support the planning proposal for 158 Gorman Road. Please feel free to contact me on 02 8456 7238 should you require anything further.

Yours faithfully,

WORLEY CONSULTING

A handwritten signature in black ink, appearing to read "Lennox To".

Lennox To

Water Resources Engineer

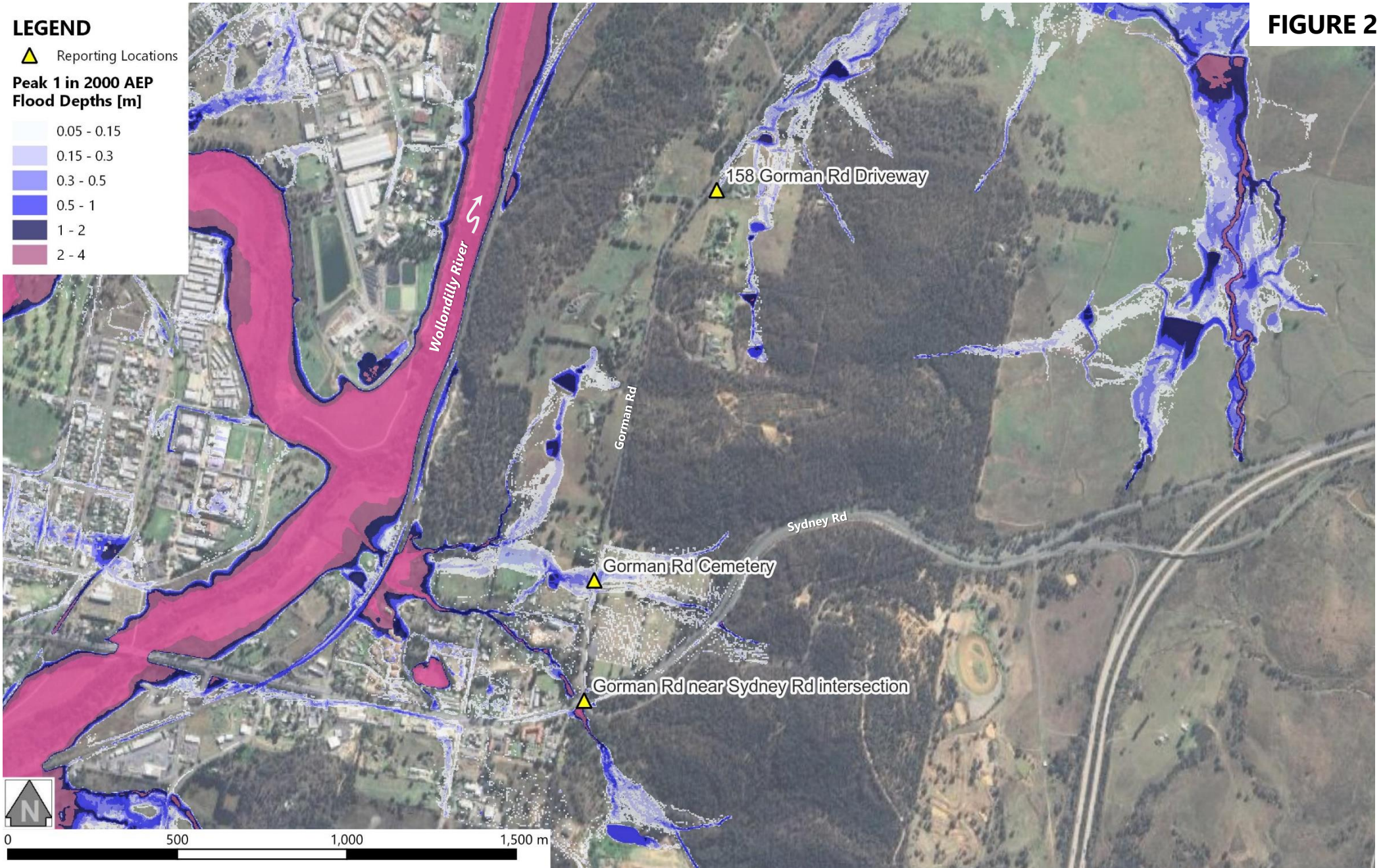
FIGURE 2

LEGEND

▲ Reporting Locations

**Peak 1 in 2000 AEP
Flood Depths [m]**

- 0.05 - 0.15
- 0.15 - 0.3
- 0.3 - 0.5
- 0.5 - 1
- 1 - 2
- 2 - 4



0 500 1,000 1,500 m



Prepared by:



REPORTING LOCATIONS

Table 1 Summary of warning times and duration of inundation at key locations

ID	Location	Event	Peak flood depth (m)	Peak flow velocity (m/s)	Inundation >0.00 m		Inundation >0.15 m	
					Time to inundation (min)	Duration of inundation# (mins)	Time to inundation (min)	Duration of inundation# (mins)
1	158 Gorman Rd Driveway (located in the south-west corner of property)	5% AEP 2 hour storm	0.03	0.77	35	146	N/A	N/A
		5% AEP 9 hour storm	0.04	0.83	167	674	N/A	N/A
		1% AEP 2 hour storm	0.05	0.93	31	150	N/A	N/A
		1% AEP 9 hour storm	0.04	0.90	138	943	N/A	N/A
		1 in 2000 AEP 1 hr storm	0.10	1.38	8	113	N/A	N/A
		1 in 2000 AEP 6 hr storm	0.07	1.11	30	691	N/A	N/A
		PMF 1hr storm	0.15	1.70	1	120	22	19
2	Gorman Rd Cemetery (approx. 350m north of Sydney Rd)	5% AEP 2 hour storm	0.10	0.71	7	174	N/A	N/A
		5% AEP 9 hour storm	0.11	0.77	19	567	N/A	N/A
		1% AEP 2 hour storm	0.14	0.86	6	175	N/A	N/A
		1% AEP 9 hour storm	0.13	0.82	11	1070	N/A	N/A
		1 in 2000 AEP 1 hr storm	0.33	1.24	3	118	12	60
		1 in 2000 AEP 6 hr storm	0.19	0.97	5	716	53	177
		PMF 1hr storm	0.47	1.48	3	118	6	73
3	Gorman Rd near Sydney Rd intersection	5% AEP 2 hour storm	<0.01	0.06	39	142	N/A	N/A
		5% AEP 9 hour storm	<0.01	0.07	175	666	N/A	N/A
		1% AEP 2 hour storm	0.01	0.12	35	146	N/A	N/A
		1% AEP 9 hour storm	0.01	0.09	150	931	N/A	N/A
		1 in 2000 AEP 1 hr storm	0.01	0.28	11	110	N/A	N/A
		1 in 2000 AEP 6 hr storm	0.01	0.16	35	686	N/A	N/A
		PMF 1hr storm	0.01	0.39	4	117	N/A	N/A

Notes:

- Duration of inundation varies across design storm events given the different critical durations for the 5% AEP, 1% AEP, 1 in 2000 AEP and PMF events