

WATER CYCLE MANAGEMENT STUDY

**Marulan Childcare Centre
69-73 George St
Marulan**

30th January 2024

ADAMS & ASSOCIATES – HYDRAULICS

Phone : 0414 873 354

Email: rob@adamshydraulics.com.au

**Po Box 2094
Malua Bay
NSW 2536**

Table of Contents

1. Site Location	3
• Figure 1 Aerial View	3
• Figure 2 Site Conditions	4
• Figure 3 Site Conditions	4
• Figure 4 Site Conditions	5
• Figure 5 Site Conditions	5
2. Proposed Development	6
3. Catchment details	7
4. MUSIC Parameters & Additional Water Quality Issues	7
5. Proposed Treatment	8
6. Pre & Post Development Comparisons	8
7. Cumulative Frequency Graphs	9
8. Stormwater Concept Plan	10

1. Site Location

The site is part of Lot 1 DP 1268661, George St Marulan & the affected area is 0.1380 Ha in area. The site slopes from the East to West towards George St, the aerial view below shows the location but Lot 1 has been significantly developed with a shopping centre & parking area. There are no stormwater treatment measures in place on the proposed affected area.



Figure1– Aerial View of 69-73 George St Marulan from maps.six.nsw.gov.au



Figure 2 – Existing access from the IGA



Figure 3 – Existing rear of site



Figure 4 – Site Conditions



Figure 5 – Discharge point at kerb

2. Proposed Developments

SITE CHARACTERISTICS	
Site Location:	69 - 73 George St Marulan
Drinking Water Catchment:	14 - Wollondilly River
Rainfall & PET Zone:	1
Affected Catchment Area:	0.138 Ha
Pre Development Site gradient:	5-7 %
Post Development Site Gradient:	2-7%
Soil Landscape:	Clay Loam
Existing watercourses through the site?	No
Overland flow draining onto the site?	No
Soils suitable for infiltration?	Yes
Site sewered?	Yes
Pre Development Details	
Pre development characteristics:	The affected area is partly car parking area for the IGA & butcher shop, without any stormwater treatment measures installed
Post Development Details	
Development characteristics:	A childcare centre is to be built with Roof area to be 720 sq.m. & paved areas of 110 sq.m.

3. Catchment Details

The site slopes from the east to the west & runs to George St. Post development stormwater will discharge to the road kerb in George St.

Catchment areas are based on flow paths to discharge point. Pre development as single treatment train & post development as flows through the bio retention basin

Land use / Surface area	Total Area (Ha)		
Pre Development			
Overland Flow	0.042		
Trafficable Gravel & Parking	0.096		
Total	0.138		
Post Development	Total	Treated through Raingarden	Untreated to street
Roof	0.072	0.072	
Roadway	0.011		0.011
Overland flow	0.055	0.055	
Total	0.138		

4. MUSIC Parameters & Additional Water Quality Issues

The site is located in the Wollondilly River Catchment & so rainfall data for Zone 14 was used for the meteorological template.

Default rainfall threshold values from Table 4.3 of Using MUSIC in Sydney's Drinking Water Catchment were used for Roofs, sealed roads & unsealed roads.

The dominant soil type would be described as Clay loam & the corresponding data was used for pervious area parameters from Table 4.4 of Using MUSIC in Sydney's Drinking Water Catchment.

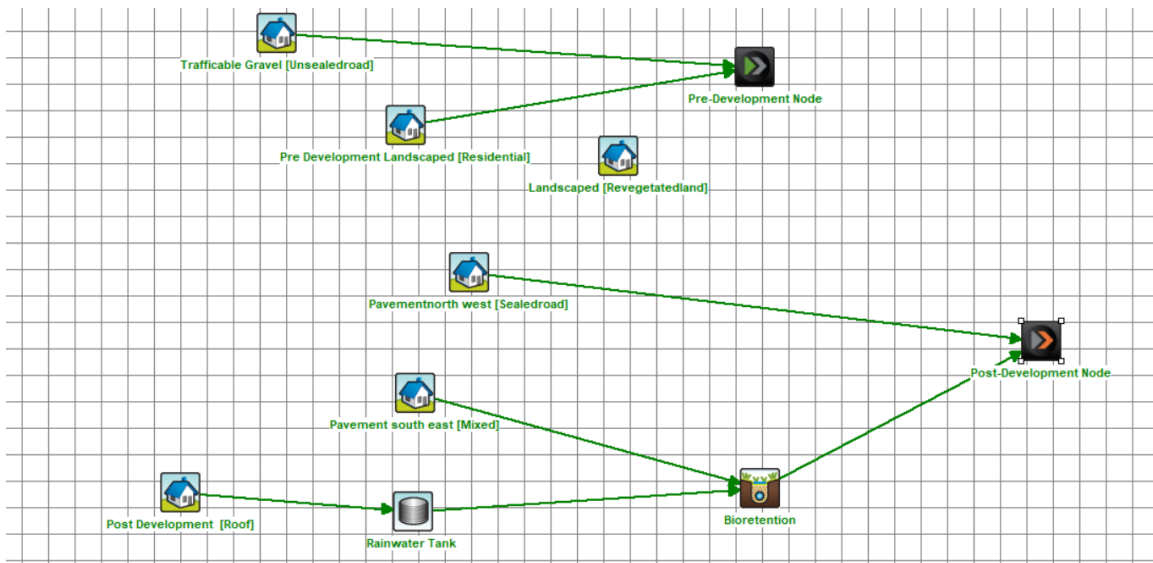
Stormwater pollutant parameters from Table 4.6 & 4.7 of Using MUSIC in Sydney's Drinking Water Catchment. were used for roofwater run off & sealed roads run off.

5. Proposed Treatment

This section should be read in conjunction with the attached drawing 01-36179 issue A dated 30th January 2024

- Roofwater from the Childcare Centre will be piped to a 22,000 litre in ground water tank, with harvested water re used for toilet flushing, cold water to the clothes washing machine & external hose cocks.
- Overflow from the tank will be piped directly to a raingarden with 6 sq.m. of filter material 400mm deep & 8 sq.m. of extended detention 200mm deep.
- The driveway runoff from the affected catchment north side will drain as overland flow directly & untreated to an on site detention tank
- The playground runoff from the affected catchment south side will drain as overland flow to pits & piped to the raingarden as above. The raingarden discharges to the on site detention tank
- The discharge from the on site detention tank is piped to the kerb in George St

6. Pre & Post Development Comparisons



Results post development after modelling treatment procedures;

	Pre Development	Post Development	% reduction
Flow (ML/yr)	0.586	0.382	
Total Suspended Solids (kg/yr)	734	26.5	96
Total Phosphorus (kg/yr)	0.331	0.068	79
Total Nitrogen (kg/yr)	1.37	0.555	60
Gross Pollutants (kg/yr)	17.5	1.96	

The above results would suggest that the development with the proposed treatment would achieve a beneficial effect on the quality of water discharged from the site.

7. Cumulative Frequency Graphs

