

## **WATER CYCLE MANAGEMENT STUDY**

**Thompson & Dell  
49 Knox St  
Goulburn**

**28th February 2025**

## **ADAMS & ASSOCIATES – HYDRAULICS**

**Phone : 0414 873 354**

**Email: [rob@adamshydraulics.com.au](mailto:rob@adamshydraulics.com.au)**

**Po Box 2094  
Malua Bay  
NSW 2536**

## **Table of Contents**

<b>1. Site Location</b>	<b>3</b>
• <b>Figure 1</b> Aerial View	<b>3</b>
• <b>Figure 2</b> Site Conditions	<b>4</b>
• <b>Figure 3</b> Site Conditions	<b>4</b>
• <b>Figure 4</b> Site Conditions	<b>5</b>
• <b>Figure 5</b> Site Conditions	<b>5</b>
<b>2. Proposed Development</b>	<b>6</b>
<b>3. Catchment details</b>	<b>7</b>
<b>4. MUSIC Parameters &amp; Additional Water Quality Issues</b>	<b>7</b>
<b>5. Proposed Treatment</b>	<b>8</b>
<b>6. Pre &amp; Post Development Comparisons</b>	<b>8</b>
<b>7. Cumulative Frequency Graphs</b>	<b>9</b>
<b>8. Stormwater Concept Plan</b>	<b>11</b>
<b>9. Bioretention Details</b>	<b>12</b>

## 1. Site Location

The proposed works are to be undertaken at No. 49 Knox St Goulburn. The area of affected catchment is 2480 sq.m. The site slopes to the east away from Knox St. The lot is within an existing industrial area. There are no stormwater treatment measures provided.



Figure1— Aerial View of 49 Knox St Goulburn from maps.six.nsw.gov.au.



Figure 2 – Access from Knox St



Figure 3 – Existing site conditions





Figure 4 – Existing site conditions



Figure 5 – Discharge point into the existing stormwater main

## 2. Proposed Developments

SITE CHARACTERISTICS	
Site Location:	49 Knox St Goulburn
Drinking Water Catchment:	8 - Mulwaree River
Rainfall & PET Zone:	1
Affected Catchment Area:	0.248 Ha
Pre Development Site gradient:	1-6%
Post Development Site Gradient:	1-6%
Soil Landscape:	Clay Loam
Existing watercourses through the site?	No
Overland flow draining onto the site?	No
Soils suitable for infiltration?	Yes
Site sewerred?	Yes
Pre Development Details	
Pre development characteristics:	The site is currently used for truck parking & storage of materials, it is a 100% trafficable gravel surface
Post Development Details	
Development characteristics:	A new industrial building with 4 commercial tenancies is to be built with sealed driveway & parking areas

### 3. Catchment Details

The site slopes from the west to the south east & away from Knox St. There is a stormwater easement through the site parallel with the southern boundary. The existing site & post development stormwater discharges to the council stormwater system through an existing stormwater pit.

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

Land use / Surface area	Total Area (Ha)			
Pre Development				
Gravel Access Driveway	0.248			
Total	0.248			
Post Development		Bioretention west	Bioretention East	Untreated
Roof	0.067	0.067		
Pavement	0.168		0.168	
Overland flow	0.007	0.007		
Overland flow untreated	0.006			0.006
Total	0.248			

### 4. MUSIC Parameters & Additional Water Quality Issues

The site is located in the Mulwaree River Catchment & so rainfall data for Zone 1 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.

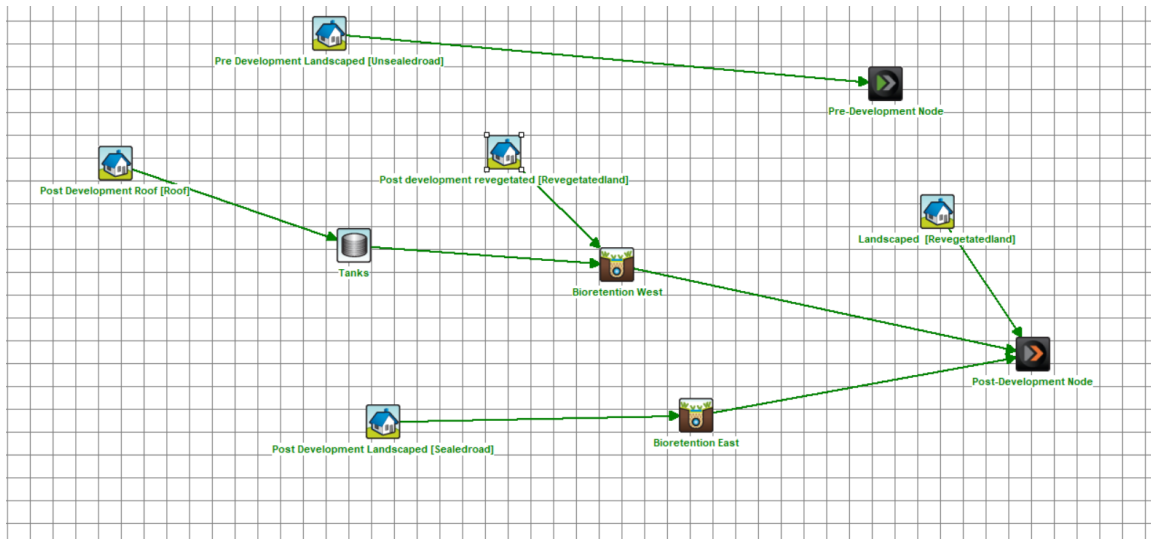
Stormwater pollutant parameters from Table 4.6 & 4.7 of Using MUSIC in Sydney's Drinking Water Catchment. were used for roofwater run off & sealed roads run off.

## 5. Proposed Treatment

This section should be read in conjunction with the attached drawings 01-36207 issue A dated 28th February 2025

- Roofwater from the commercial building will be piped to 2 water tanks with a combined 25,000 litre rainwater tank, with harvested water to be re used for toilet flushing , external hose cocks & irrigation purposes.
- Overflow from the rainwater tanks will be piped directly to a bio retention basin, with 37 sq.m. of filter material 400mm deep & 63 sq.m. of extended detention 200mm deep.
- Overland flows from the driveway & parking will be graded to a seperate bio retention basin parallel with the eastern boundary, with 25 sq.m. of filter material 400mm deep & 25 sq.m. of extended detention 200mm deep.
- The discharge from the bio retention basin will be piped to council's stormwater system.

## 6. Pre & Post Development Comparisons





Results post development after modelling treatment procedures;

	Pre Development	Post Development	% reduction
Flow (ML/yr)	0.795	1.24	
Total Suspended Solids (kg/yr)	952	27.7	97
Total Phosphorus (kg/yr)	0.446	0.125	72
Total Nitrogen (kg/yr)	1.83	1.14	37
Gross Pollutants (kg/yr)	29.7	0.134	

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

