



12 July 2024
Ref No: 3204-1184

General Manager
Clarence Valley Council
Locked Bag 23
Grafton NSW 2460

DA2023/0759, Lot 104 DP 751388 James Creek Road: Statement regarding stormwater discharge from south-west catchment to Austons Lane road reserve

Dear Sir / Madam

The purpose of this letter is to describe the existing and proposed stormwater discharge from the south-west catchment of the development site to the Austons Lane road reserve, including the formed and unformed sections. The overall stormwater management strategy for the proposed residential development is described in the *Stormwater Management Report: Lot 104 DP 751388, James Creek Road* (ref: 3204-1125 dated 24/11/2023) prepared by GeoLINK. For further details, please refer to this report.

In the existing situation, surface runoff from the south-west catchment flows in a general south-west direction following the slope of the land. Runoff that reaches the southern boundary is collected in a table drain (vegetated open drain) that runs in an east-to-west direction along the north side of Austons Lane (refer to Plate 1 on the following page). Based on survey data and site observations, runoff that flows towards the western boundary is diverted towards the south. Ultimately, surface runoff from the south-west catchment flows to the south-west corner of the development site.

As a result of the proposed residential development, there will be an increase in the impervious surfaces (e.g. roofs, road pavement) within the south-west catchment. This will result in higher stormwater flows and higher stormwater pollutant loads being generated from within the development site. To mitigate this, two bioretention basins will be located in the south-west corner of the development, and stormwater will be conveyed to these basins before being discharged from the site. The basins will perform the dual function of providing peak flow attenuation and treatment of stormwater. There will also be some infiltration of stormwater through the base of the basins into the underlying soils, thereby reducing the volume and frequency of surface runoff from the site.


To reduce stormwater flows, the function of the basin is to temporarily fill with stormwater and release the stormwater more slowly via controlled/throttled outlet pipes. Essentially, the flow rate of stormwater out of the basin (to the Austons Lane road reserve) is less than the flow rate of stormwater into the basin due to this buffering effect. Treatment of stormwater is provided by filtering the stormwater through the soil and vegetation within the basin. The outlet from the basin will incorporate a level spreader to disperse flows and appropriate rock-lined scour protection.



Plate 1: Photo from south-west corner of development site looking east along Austons Ln

The stormwater peak flow attenuation requirement is to ensure that the peak flow discharging from the site in the post-development situation does not exceed the peak flow from the site in the existing pre-development situation. This has been tested for numerous (>100) 'design storms' with a range of likelihood of occurrence, in accordance with procedures described in the national guideline Australia Rainfall & Runoff. For example, a 5 year 'average recurrence interval' (ARI) design storm has a rainfall pattern and total rainfall depth that is predicted to occur at a particular location, on average, once every 5 years. The simulations have been undertaken using a model developed with the DRAINS software and the results are presented in the table below.

Design Storm Event (ARI)	Peak Flow (m ³ /s)		Post-Dev Peak Flow as % of Pre-Dev Peak Flow	Peak Water Depth in Basin (m)
	Pre-Development	Post-Development		
5 yr	0.50	0.43	86%	-
10 yr	0.77	0.51	66%	-
20 yr	0.92	0.61	66%	-
50 yr	1.23	0.98	80%	-
100 yr	1.40	1.23	88%	1.08



The results demonstrate that the basins provide the required level of stormwater peak flow attenuation for all relevant design storm events. In fact, the peak flow attenuation significantly exceeds Council's requirements, with the post-development peak flows being at least 10% lower than the pre-development peak flows for all design storm events.

With regard to potential impacts on the Austons Lane road reserve, this means that in a specific design rainfall event the peak flow of stormwater into the road reserve will be less in the post-development situation compared to the existing situation. Therefore, the proposed development, with peak flows being mitigated by the basins, will not lead to increased issues in the road reserve associated with exceedance of drain capacity, erosion or scour.

The rainfall data used in the DRAINS model simulations has been generated from the Australian Rainfall & Runoff data hub for a location that is approximately 1.3 km to the north-west of the proposed development site. As such, the rainfall data is considered to be representative and appropriate.

The ability of the bioretention basins to provide treatment of stormwater has been confirmed by a model developed with the MUSIC software. The stormwater treatment requirement is to meet Council's pollutant load reduction targets. The MUSIC model results confirm that these targets have been achieved and also that post-development loads of key pollutants are less than the pre-development loads. These results demonstrate that there won't be any detrimental water quality impacts on the Austons Lane road reserve.

All stormwater infrastructure associated with the south-west catchment of the proposed development will be located within the development site boundary. No infrastructure will be constructed within the Austons Lane road reserve.

Overall, the stormwater design for the proposed development meets or exceeds Council's requirements. Based on discussions at a meeting with Council on 27th June 2024, it is our understanding that Council staff are satisfied that the design meets the relevant requirements.

Please contact me on 02 6687 7666 if you would like further clarification regarding the above.

Yours sincerely

GeoLINK



Duncan Thomson

Principal Environmental Engineer