

**ATTACHMENT 4**

GOULBURN BROKEN CATCHMENT MANAGEMENT AUTHORITY (GBCMA) LETTER

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Our Ref: PLN/Mitchell General



5 February 2020

Chris Beardshaw  
Director  
Afflux Consulting Pty Ltd  
PO Box 457  
Emerald VIC 3782

Dear Mr Beardshaw

**Stormwater Management Strategy – Mclvors Road Kilmore (Dec 2019)  
(South-East Precinct of the Kilmore Structure Plan)**

I refer to the abovementioned document seeking comments and support from the Goulburn Broken CMA.

I also refer to meeting held at the Goulburn Broken CMA's Office of 21 January to discuss the strategy, particularly in relation to waterway management and flooding matters.

The Goulburn Broken CMA understands that this strategy is a requirement of Mitchell Shire Council's Kilmore Structure Plan – Guiding the Growth of Kilmore (August 2016 as revised including Planning Scheme Amendment C123 Gazettal 28 March 2019). The Mclvors Road relates to the South-East Precinct of the Structure Plan.

The Goulburn Broken CMA in 2016 wrote to the Council expressing concerns with the approach to significantly alter waterways.

The adopted Kilmore Structure Plan has however recognised guiding principles for drainage, and biodiversity and Environment (page 19). Further, at pages 31, 64 and 66, the Plan recognises the values of natural features including waterways. It would appear that Figure 44 (page 87) is somewhat counter to the narrative of Kilmore Structure Plan.

From our meeting, you highlighted explained that your submitted Stormwater Strategy has somewhat departed from Figure 44, and is more aligned with the narrative of the Kilmore Structure Plan.

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From our discussions, the Goulburn Broken CMA wishes to make the following observations in relation to the Stormwater Strategy – Mclvors Street:

1. The Kilmore Structure Plan requires:
  - a. A holistic approach for water sensitive urban design approaches to stormwater treatment and management.
  - b. The preparation of a fully costed sub-catchment wide drainage schemes as a **precondition of any further rezoning or development within Kilmore growth precincts** as identified in Chapter 4 and Chapter 5 (of the Kilmore Structure Plan). It is understood that the Stormwater Strategy informs this requirement at a strategic conceptual level prior to investing in this detailed work, but would appear that the detailed work is required for the precinct holistically rather on a stage by stage approach.
2. From our discussions, it was explained that your Stormwater Strategy has somewhat departed from Figure 44 and is more aligned with the narrative of the Structure Plan, and:
  - a. Predominant waterways are aligned along its natural alignments within a 60 metre wide corridor. This is more acceptable to the Goulburn Broken CMA. The exceptions are small sized catchments (east of the site) that are to be re-aligned with a combination of a low-flow pipe and swale known as the “green-link”, and minor drainage lines further west.
  - b. The smaller eastern catchments are generally ill defined in terms of “bed and banks” that provide particular constraints for stormwater management options that led to the “green-link” strategy.
  - c. Stormwater water treatments and retardation basins are off-line.
  - d. Wetlands (flood storages) are provided at the downstream end of the development (Tootle Street East and West) to assist with treating flood impacts. This includes the Kilmore Creek that already has a drainage plan. The flood storage is to assist with managing flood impacts.
  - e. There are concerns about the sustainability around wetlands in terms of required water volumes to support wetlands, and water quality or lack thereof (such as blue-green algae), which has been problematic with other man-made wetlands.
  - f. It is recognised that the waterways are likely to see changes in hydrology due to the ultimate development conditions, and there are likely to be unintended consequences in terms of geomorphic impacts (i.e. bed deepening and widening which may impact on surrounding infrastructure) if not well designed and managed.
  - g. To manage hydrologic changes, some waterways will need to be enhanced to ensure, amongst other things, intrinsic stability. It is noted that a straightened waterway-reach to Tootle Street West will need to be reinstated within a proposed 60 metre wide corridor – this is considered a positive way forward.
  - h. It is noted that the hydrologic analysis has only been carried out to date and it is acknowledged that there is a need for hydraulic review. Such hydraulic modelling would greatly inform third-party flood impacts (if any), and to inform geomorphic design of the waterways, particularly in terms of (g) above. It would be beneficial to look at this holistically rather than wait for each specific drainage-plan for each stage (that is likely to be many years) so that developers are aware of the challenges required to be addressed when the time arrives. This should be presented in the Stormwater Strategy. This matter is further detailed below.

Having regards to the above on balance, the Goulburn Broken CMA in principle, supports the Stormwater Strategy (Mclvors Road) subject to additional information to be documented within the strategy:

- 1) For the ultimate developed conditions, a hydraulic assessment (of the precinct, i.e. all stages) is to be included to establish/demonstrate holistically that the conceptual strategy:
  - Provides no “adverse” third-party impacts to downstream areas and the upstream areas of the proposed “green-link.”
  - Provide hydraulic parameters (i.e. discharge, velocity) is assist with geomorphic response together with a list of possible detailed design matters to be considered in detailed design phase such as soil types, grade reducing structure, etc.
- 2) For the ultimate developed conditions, an assessment of the viability of the proposed wetlands to ensure that proposed measures are ecologically sustainable in terms of required water volumes to support wetland flora, and without impacts to water quality and waterway health (including blue-green algae).

Alternatively, the Goulburn Broken CMA would be prepared to see the above be carried out following rezoning as part of the required Development Plan as part of Planning Scheme Amendment C136. Therefore, the Section 7 of the Stormwater Strategy should include the narrative to sign-post the above requirements (including the Kilmore Structure Plan (see (1(b)) above) as part of the required Development Plan.

If you have any queries, please contact Tom O’Dwyer on **(03) 5822 7700**. Please note that all electronic correspondence should be directed to [planning@gbcma.vic.gov.au](mailto:planning@gbcma.vic.gov.au).

Yours sincerely



Guy Tierney

**Statutory Planning and  
Floodplain Manager**

cc Sean Greer Mitchell Shire Council

Our Ref: GBCMA-F-2021-00111  
GBCMA-F-2020-00047  
Contact Officer: Joel Leister  
Your Ref: 24055  
Date: 1 March 2021



Mr Chris Beardshaw  
Afflux Consulting  
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chris@afflux.com.au

Dear Mr Beardshaw

**Floodplain Management Advice for  
Tootle St (East), Kilmore – Hydraulic Assessment  
Lot 1 TP80904, Parish Of Bylands  
2 Tootle Street Kilmore Vic 3764**

The Goulburn Broken CMA has previously provided Mitchell Shire Council with correspondence (Ref: GBCMA-F-2020-00047 and GBCMA-F-2020-00047-2) that provided in principle support for the Stormwater Management Plan associated with the development of the Kilmore South-East Precinct.

The additional information provided by Afflux Consulting on 1 February 2021 was aimed at confirming several items referenced in the Goulburn Broken CMA's previous responses, namely:

1. Ensure no worsening of flooding in the 1% AEP flood event as a result of the proposed development.
2. Ensure the proposed lot layout is flood free.
3. Ensure no worsening of flooding due to the proposed 'Green Link'; and
4. Provide hydraulic parameters (such as depth, velocity, levels) to assist with the geomorphic response for the waterway.

The report provided by Afflux Consulting (*Tootle St (East), Kilmore – Hydraulic Assessment*, Ref: 442\_01 R01c, 17 December 2020) has addressed the following concerns:

- The mapping presented in Appendix C of the *Hydraulic Assessment* has demonstrated that the 1% AEP flood extent is confined to the waterway alignment and identified drainage alignment (flowpaths), i.e., it does not extend onto areas proposed for residential development (including proposed lots).
- The report demonstrates that the flows through Centenary Drive and downstream of the proposed development have decreased due to the measures proposed to manage runoff and flow from the proposed development.

**Note:** Figure 20 does not appear to correctly present the modelled afflux downstream of the development, however, the information presented is

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sufficient for the Goulburn Broken CMA to be comfortable that there is no worsening of flooding during a 1% AEP event downstream of the development.

- The modelling of the 'Green Link' has demonstrated sufficient capacity to match the overland flowpath that, under existing conditions, flowed to the north west from Quinns Road.
- The report has provided flood depths, flood levels and depth x velocity product for proposed development which can be used to assess the geomorphic response of the waterway and which will enable consideration of these waterway characteristics in future design stages.

The Goulburn Broken CMA agree that the proposed retarding basin configuration and 'Green Link' design do not worsen the flood risk to the area, particularly downstream of the development.

Having regard to the above, the Goulburn Broken CMA **does not object** to the concepts and strategies for surface water management as outlined and proven by the hydraulic analysis of Afflux Consulting (2020), **subject to the following conditions:**

- The detailed design of the 'Green Link' and other associated drainage infrastructure must maintain (or better) the performance demonstrated in the hydraulic analysis (Afflux Consulting, 2020) in terms of flood attenuation.
- The Development Plan (DP) and subsequent Stormwater Management Plans for individual parcels of the proposed development are provided to the Goulburn Broken CMA for assessment.

If you have any queries, please contact Joel Leister on **(03) 5822 7700**. To assist in handling any enquiries please quote **GBCMA-F-2020-00047** in your correspondence. Please note that all electronic correspondence should be directed to [planning@gbcma.vic.gov.au](mailto:planning@gbcma.vic.gov.au).

Yours sincerely



Guy Tierney  
**Statutory Planning and**  
**Floodplain Manager**

Information contained in this correspondence is subject to the definitions and disclaimers below.

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2. While every endeavour has been made by the Authority to identify the proposed development location on its GIS using VicMap Parcel and Address data, the Authority accepts no responsibility for or makes no warranty with regard to the accuracy or naming of this proposed development location according to its official land title description.
3. **AEP** as Annual Exceedance Probability – is the likelihood of occurrence of a flood of given size or larger occurring in any one year. AEP is expressed as a percentage (%) risk and may be expressed as the reciprocal of ARI (Average Recurrence Interval).
4. **ARI** as Average Recurrence Interval - is the likelihood of occurrence, expressed in terms of the long-term average number of years, between flood events as large as or larger than the design flood event. For example, floods with a discharge as large as or larger than the 100-year ARI flood will occur on average once every 100 years.

5. **AHD** as Australian Height Datum - is the adopted national height datum that generally relates to height above mean sea level. Elevation is in metres.
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