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BY POST / EMAIL – robyn.birkett@mackay.qld.gov.au

Dear Robyn,

Draft flood studies for the Sandy Creek, Rocky Dam Creek (Koumala) and Funnel Creek (Sarina Range) catchments

Thank you for the opportunity to comment on the draft flood studies for the Sandy Creek, Rocky Dam Creek (Koumala) and Funnel Creek (Sarina Range) catchments. Chris Porter and Michael Jewell attended the Council's presentation on 6 December 2019 on the latest flood studies. The Mackay Whitsunday Branch of the Urban Development Institute of Australia (the Institute) is concerned that the Flood studies require further work before finalisation. All the related studies should utilise the best available scientific and engineering basis especially prior to progressing to any planning scheme or other assessment changes. The Institute is also very concerned about the potential impact of the Sandy Creek study on the future Rosella State Industrial precinct.

From the presentation, there seemed to be a consensus amongst the Council officers at the presentation that there was some urgency to have these draft flood study reports to Council early in the year for adoption. However, there seems to be a lack of base contour and/or rain gauge information available to support more accurate results being produced from the studies. It is considered further ground truthing is required before these studies should progress.

As such, the Institute considers that all base information should be obtained and the studies refined before they are formally reported to Council for adoption.

Has summarised some of the findings and concerns with the studies and provided recommendations to address shortcomings below.

Funnel Creek Catchment - Draft Report

The key findings from the TUFLOW hydraulic modelling and associated analysis undertaken for the Sarina Range Funnel Creek Flood Study project is of concern, as the accuracy of the 30m resolution SRTM terrain data limits model accuracy. No vertical accuracy was specified in the topography metadata and independent studies by Jet

Propulsion Laboratory identified that 90% of the SRTM performance was within 4.7m when comparing against the available ground levels. For comparison, LIDAR has a vertical accuracy of approximately +/-0.15m.

The following additional information is recommended to be provided for a more extensive future flood study within the study area:

- Survey of culverts locations and sizes
- Finer terrain data to differentiate roads and other key features
- 'Ground truthing' of the terrain data, especially in areas under sugar cane crops
- Implementation of rainfall gauges within the Funnel Creek catchment to allow for recording of future major rainfall events.

Rocky Dam Creek Catchment - Draft Report

The key assessment concerns from the TUFLOW hydraulic modelling and associated analysis undertaken for the Rocky Dam Creek - Koumala Flood Study project are summarised below:

- The hydraulic simulation infers that an intense localised rain event occurred over the catchment west of Koumala, this was not captured in a sub-daily rain gauge
- LIDAR data quality with respect to the processing of cane fields and heavy vegetation is of concern in that flow patterns/depths may be influenced by LIDAR data quality
- It is not fully known the extent of cane laying over that thus reduces the impedance of floodplain flows, data should be obtained on this hydraulic roughness.

Completion of the following information is recommended prior to executing future calibration flood studies within the Rocky Dam Creek catchment:

- Survey of railway hydraulic structures such as bridges and culverts
- Survey of pits and pipes, specifically within the township of Koumala
- Current LIDAR flown at a time when the cane is at a relatively low height
- 'Ground truthing' of the terrain data, especially in areas under sugar cane crops
- Installation of point rainfall gauges located throughout the catchment for future rainfall events to assist in calibration.

Sandy Creek Catchment – Draft Report

The key assessment concerns from the TUFLOW hydraulic modelling and associated analysis undertaken for the Sandy Creek Catchment – Tropical Cyclone Debbie Flood Study project is summarised below:

- The shortfalls of the TUFLOW hydraulic model validation infers that an intense localised rain event occurred over the catchment and was not captured by a rain gauge
- LIDAR data quality with respect to the processing of cane fields and heavy vegetation is of concern and it is believed that modelled flow patterns have been influenced by LIDAR data quality
- It is not fully known the extent of cane laying over that thus reduces the impedance of floodplain flows, data should be obtained on this hydraulic roughness.

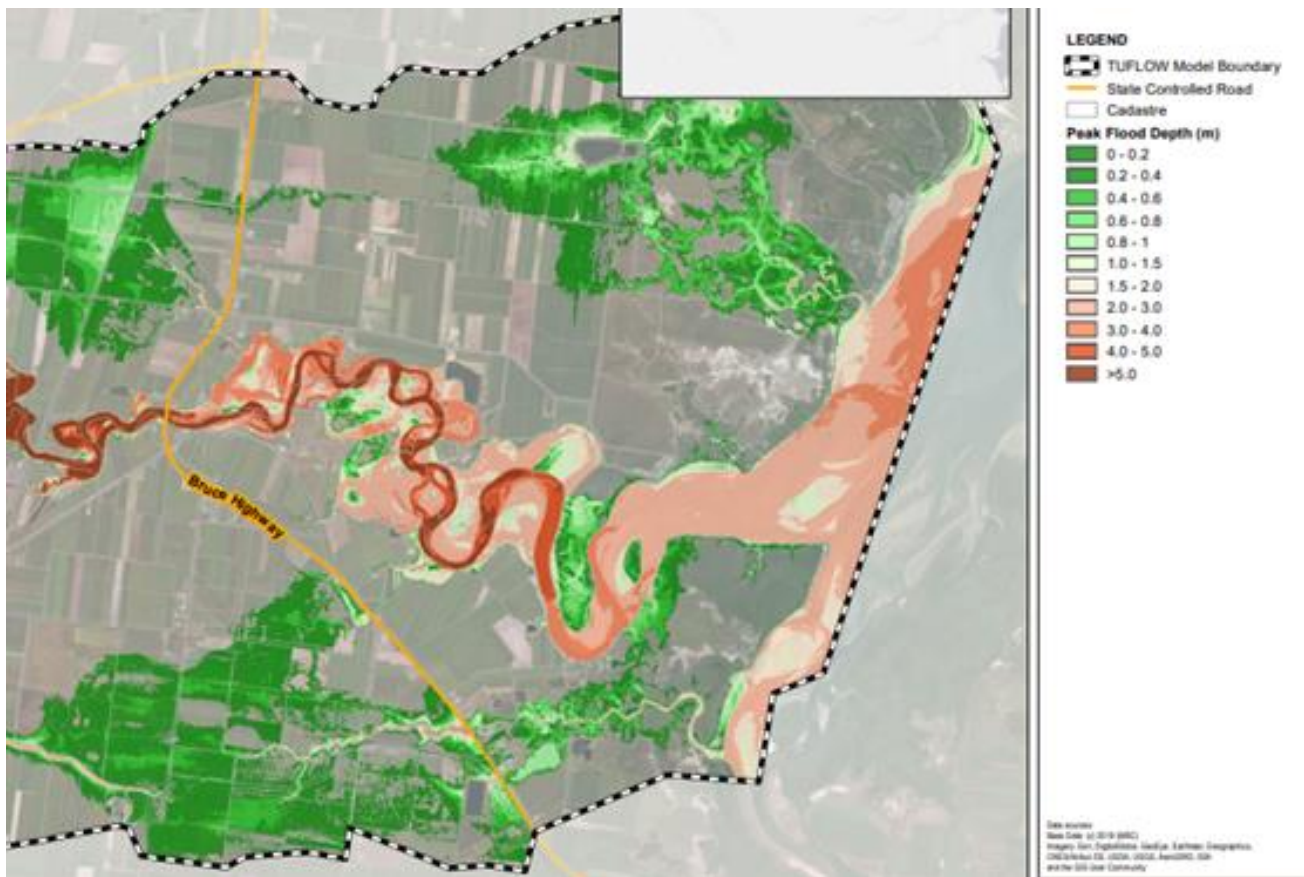
It is recommended that the following be completed prior to executing future model calibration or hydraulic investigations within the Sandy Creek catchment:

- Survey all hydraulic structures such as bridges and culverts for MRC, Mackay Sugar and QR owned assets
- Revise the LIDAR survey over the entire catchment, whether by a new survey or investigating the filtering and triangulation of the current data
- Install additional rainfall gauges throughout the catchment for future rainfall events to assist in calibration
- It is strongly recommended that more detailed flood extents and levels are captured throughout the catchment in future flood events for potential model validation / calibration in future stages of hydraulic investigations
- The use of low-cost flood height gauges has significant potential to improve the confidence in the quality of the flood level data.

We have extracted below one of the maps from the Sandy Creek Catchment draft report which shows the possible 1% AEP Event impact on the southern portion for the Rosella State Industrial Precinct. The Institute is concerned that filling in this precinct may be restricted unnecessarily as a consequence of the report. The modelled flooding appears to be a fairly minor (comprising backwater) at around 0.3m to 0.4m. This finding should be checked and appropriate resolutions to allow for development should be defined as part of the report.

We also note the Bruce Highway crosses the northern boundary of the study area, at approximately the location of the Rosella Store i.e. intersection of the Bruce Highway and Homebush Road and should be considered in the report.

Peak Flood Depth 1% AEP Event – 18 Hour Storm - Rosella



Conclusion

The Institute is very concerned with the urgency to finalise the flood study outputs, without proper consideration of some basic data. As a consequence, Council’s mapping overlays will show properties being inundated which were unaffected during the actual event. This adds uncertainty for some residents within the study areas, can potentially (and needlessly) increase insurance premiums and, will undermine the public’s confidence in the relevance of these types of engineering studies. As such, the Institute requests that Council delay putting all three flood studies up for adoption before updated, ‘ground truthed’ LIDAR and feature survey information can be incorporated into the base models.

Urban Development Institute of Australia Queensland - draft flood studies for the Sandy Creek, Rocky Dam Creek (Koumala) and Funnel Creek (Sarina Range) catchments

Thank you for the opportunity to comment on the draft flood studies for the Sandy Creek, Rocky Dam Creek (Koumala) and Funnel Creek (Sarina Range) catchments to contribute to a robust outcome for the community. If there is any matter that you wish to discuss, please contact Manager of Policy, Martin Zaltron at mzaltron@udiaqld.com.au.

Yours sincerely,

Urban Development Institute of Australia Queensland

A handwritten signature in black ink, appearing to read 'Mark McGrath', with a stylized flourish at the end.

Mark McGrath

Mackay Whitsunday Branch President