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PROPOSED DEVELOPMENT
68 SHORT STREET, MUDGEE

FLOOD ASSESSMENT REPORT

9TH NOVEMBER 2023
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1 INTRODUCTION AND PROJECT DESCRIPTION

1.1 PROJECT OVERVIEW

Triaxial have been engaged by Mr Neville Lynch to investigate the implications of flooding on the proposed development located at 68 Short Street, Mudgee.

The proposed development includes the subdivision of land with a total of nine lots proposed, including one dual occupancy lot.

The purpose of this report is to review the existing flood information and provide a detailed flood map through the site to assess any potential flooding impacts and provide recommendations if necessary.

The site sits on the banks of the Cudgegong River. The Northern portion of the site sits at a low level and makes up part of the Cudgegong River floodplain. The Northern portion of the site sits 3-4m higher in elevation.

Figure 1: Existing Site Plan

2 EXISTING FLOODING INFORMATION AND STUDIES

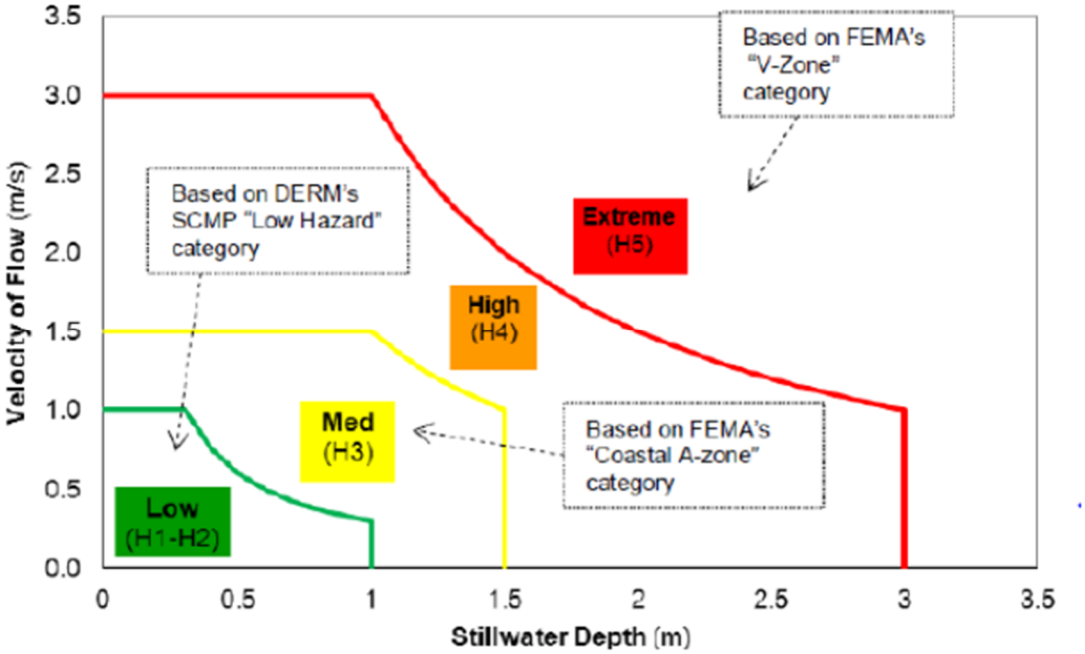
2.1 MUDGEE FLOOD STUDY 2021

The latest flood study information available was produced by WMA Water in 2021. Access to the processed results of the flood hydraulic modelling are available through the SES flood data portal.

The WMA data for the site shows that the site is flood affected in the 1% AEP flood event, as shown in the figure below.

Figure 2: 1% site flood inundation in the WMA water flood study.

A summary of the criteria and a description of each hazard category used in the modelling is shown in Figure 3 below:



Low Risk to Life and property		*High Risk to Life and property*		
H1	***H2***	***H3***	***H4***	***H5***
Insignificant [1]	***Minor*** [1]	***Moderate*** [1]	***Major*** [1]	***Catastrophic*** [1]
No significant life risk *Property risk only to items which come in direct contact with floodwaters such as building contents*	*Low life risk. Able bodied adults can walk safely.* *Cars can float and precautions must be followed to keep them out of floodwaters*	*Moderate life risk.* *Able bodied adults cannot safely walk* *Only large vehicles (trucks) can safely travel.*	*Major life risk* *Light frame buildings (e.g. houses) can fail structurally*	*Extreme life risk* *Majority of buildings could fail*

Figure 3: Flood Hazard mapping criteria.

Flood hazard mapping from the Mudgee Flood Study for the site is shown in figure 4 below.

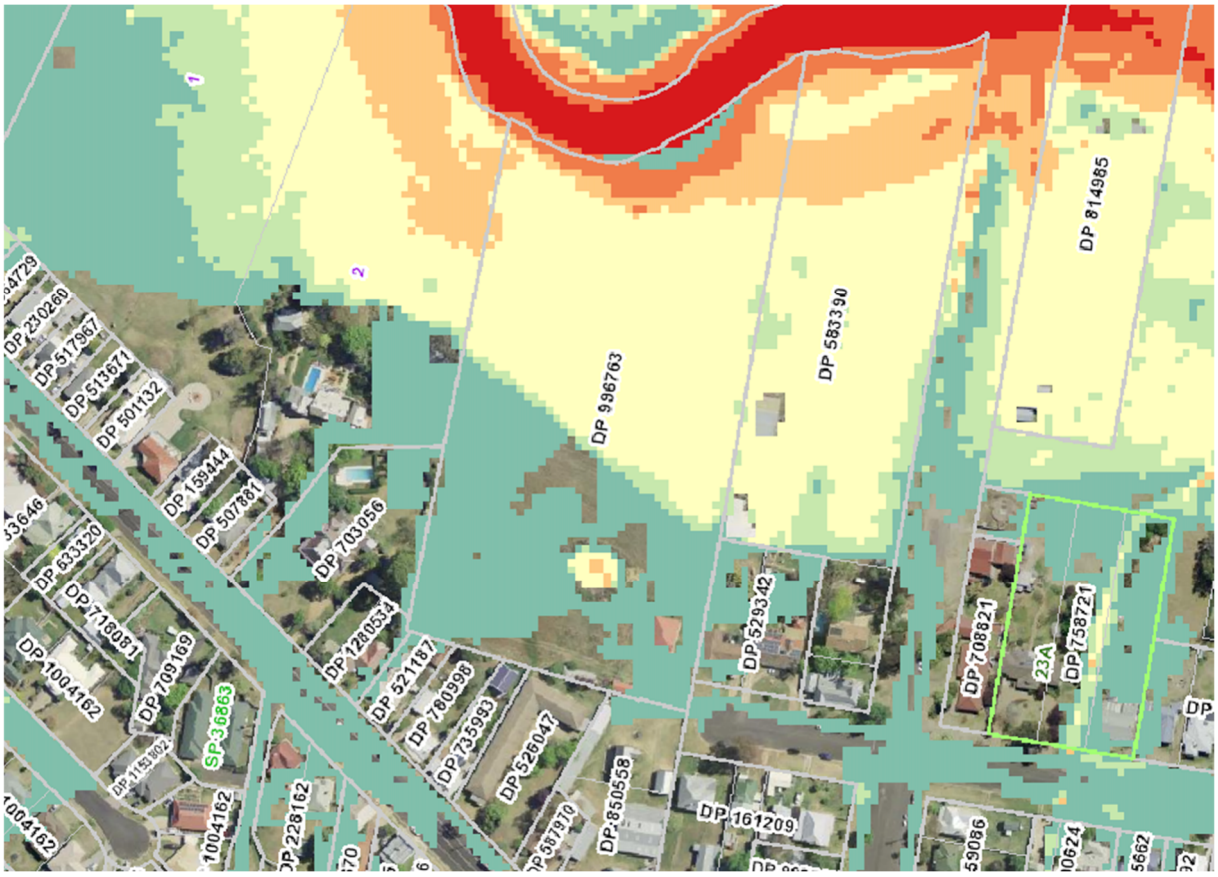


Figure 4: 1% site hazard mapping in the WMA water flood study.

The site flood levels vary across the site, with minor shallow flows entering the site from the South Western corner and travelling through the site towards the Cudgegong River.

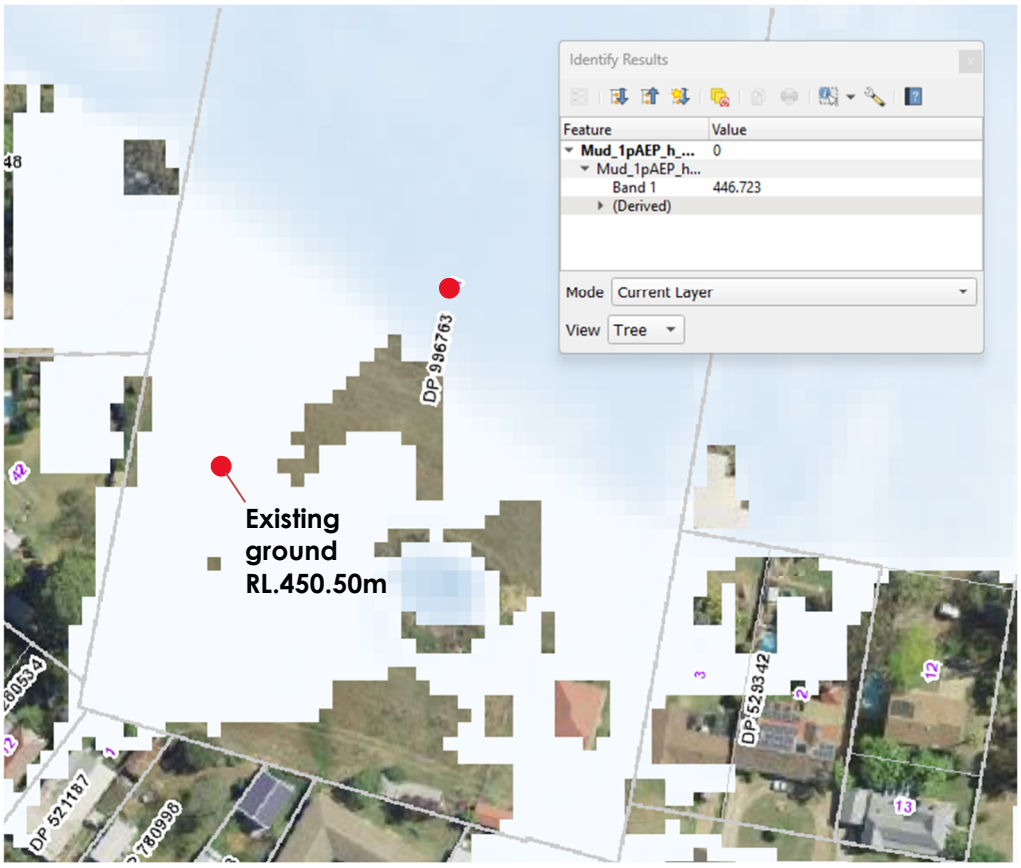


Figure 5: Flood level at point indicated and ground level at higher end of the block

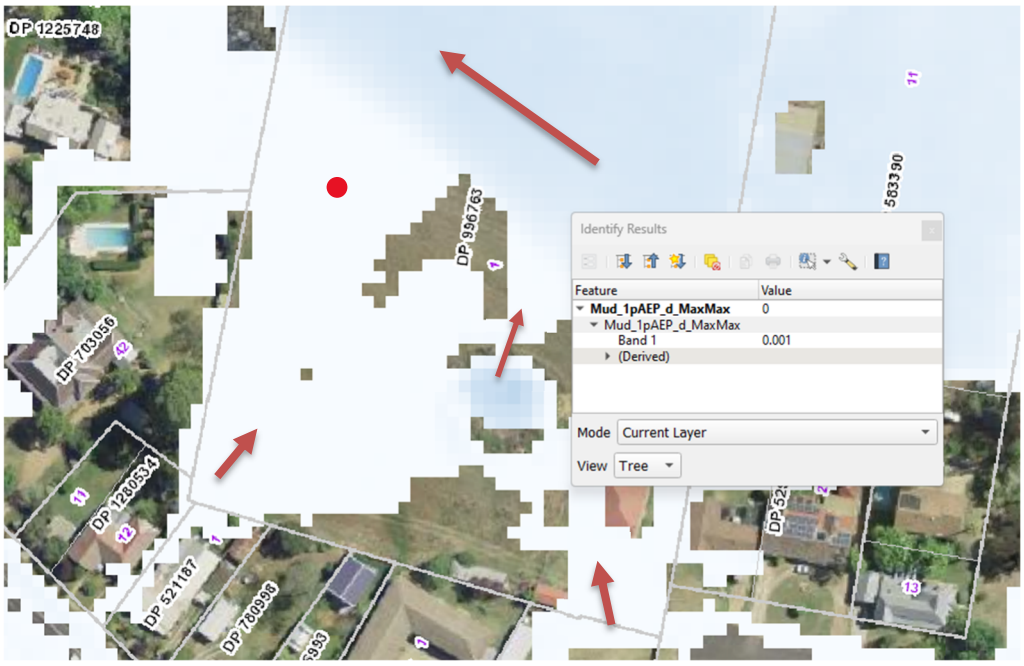


Figure 6: Flood level at point indicated (1mm depth) and direction of flow through the site.

The flood mapping generated from the Mudgee Flood Study indicates the following outcomes:

- The proposed development site is flood affected in the 1% AEP flood.
- The flood depths vary across the site. At the lower portion (Northern end) of the site towards the river, the flood depth varies between 700mm to 900mm deep.
- At the Southern end of the site, which is substantially higher, the flood levels vary generally from 1mm to 25mm depth, apart from the existing dam, which is up to 1.4m deep.
- The dam and overland flow paths are fed from the Southern overland flow through the site, not the riverine flooding. Water will overflow from the dam towards the North to join the major river flood waters.
- Hazard levels are extremely low over the area proposing to be developed (hazard level 1). The only area of higher hazard is the existing dam.
- Velocities through the site are between 0.5m/s to 1.3m/s at the localised dam inflow.

A review of the available flooding shows that the Southern end of the site where the development is proposed will not be affected by riverine flooding, as when the depths less than 30mm (indicating localised overland flow areas) are removed from the data, the result is flood inundation as shown in Figure 7 below.

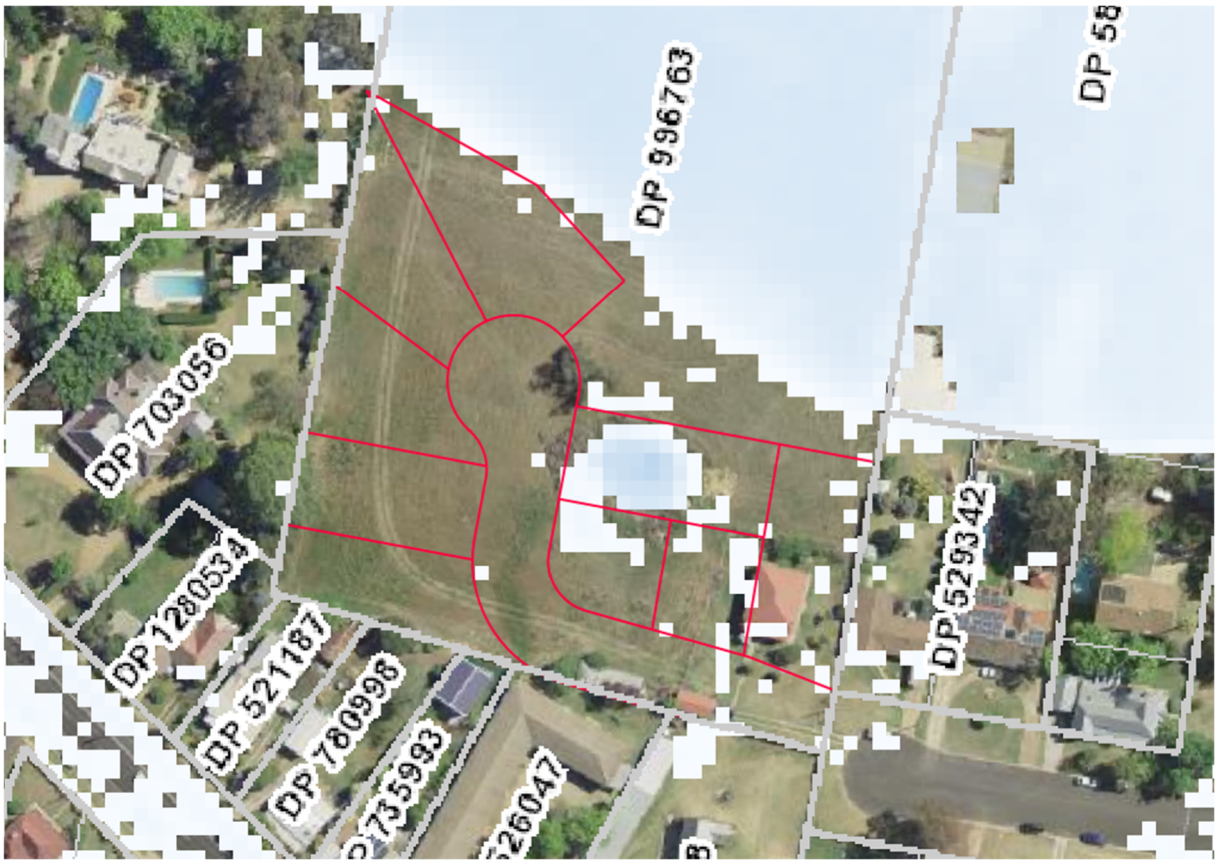


Figure 7: 1% AEP flood level with depths less than 30mm removed and proposed site boundaries

It is also proposed that the existing dam be removed as part of this development. This will not affect the upstream or downstream flood levels on the site as the minor overland flow will continue towards the North.

The removal of the existing dam will also eliminate the higher hazard area from the development site, as shown in Figure 8 below.

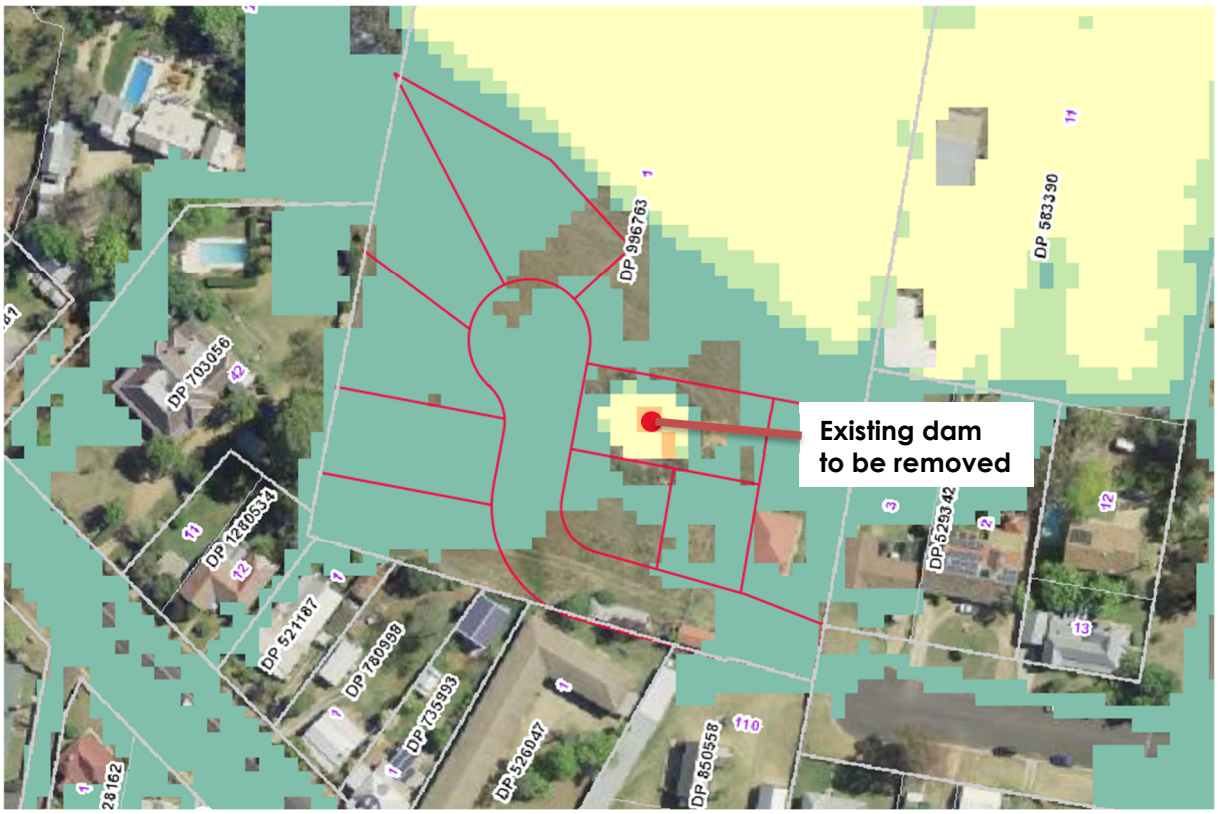


Figure 8: 1% AEP hazard levels across the site with proposed subdivision layout superimposed.

3 RECOMMENDATIONS

After review of the model results and mapping output, we propose the following measures as part of the development:

- Dam removal – this will eliminate an existing high hazard area. The dam is flagged as high hazard due to the depth of water storage (1.4m approx.). Removal of the dam will eliminate the higher hazard as water will no longer be detained.
- Provision of drainage infrastructure and an overland flow path through the site.
    - An overland flow path capable of conveying the 1% AEP event through the site will be provided by the introduction of a new road reserve 16m wide. Appropriate outlet treatment at the Northern end of the cul-de-sac will ensure water can be safely conveyed to outlet into the river on the lower (Northern) side of the block.

- Minimum building Finished Floor Levels. Currently Triaxial consulting plans TX16264.00-C2.01 show a proposed floor level for the two Northern blocks (lot 4 and lot 5). The proposed finished floor level is more than 500mm above the 1% AEP flood level.
- Safe access will be available from the site to Short Street from all proposed lots.

3.1 DCP REQUIREMENTS

The following is an extract from the Mid Western Regional Council Development Control Plan 2013, Appendix A – Matrix 1 – Urban Floodplains.

MATRIX 1 URBAN FLOODPLAINS

Urban Floodplains

Planning & Development Controls

	Flood Risk Precincts (FRP's)																							
	Low Flood Risk								Medium Flood Risk								High Flood Risk							
Planning Consideration	Essential Community Facilities	Critical Facilities	Subdivision	Residential	Commercial & Industrial	Tourist Related Development	Recreation& Agriculture	Minor Development	Essential Community Facilities	Critical Facilities	Subdivision	Residential	Commercial & Industrial	Tourist Related Development	Recreation& Agriculture	Minor Development	Essential Community Facilities	Critical Facilities	Subdivision	Residential	Commercial & Industrial	Tourist Related Development	Recreation& Agriculture	Minor Development
Floor Level		3		2	2	2						2	2	2	1	2,4							1	2,4
Building Components		2		1	1	1						1	1	1	1	1							1	1
Structural Soundness		2										2	2	2	2	2							1	1
FloodAffectation		2	2		2	2					1	2	2	2	2	2							1	1
Evacuation		2									1	1	1	1	1	1							1	1
Management & Design		4,5									1		2,3,5	2,3,5	2,3,5	2,3,5							2,3,5	2,3,5

Not Relevant Unsuitable Land Use

Note: reference to freeboard refers to an increased height of 0.5 metres

The area of the site to be developed would be classified as "Medium Flood Risk". The DCP definition

- **Medium Flood Risk**

  Land below the 100 year ARI flood level that is not subject to high hydraulic hazard and where there are no significant evacuation difficulties.

As there are no evacuation difficulties from any of the proposed blocks out to Short Street, and the area of the site inundated is a Hazard level of 1, we consider the site to be a medium flood risk, which is acceptable for subdivision works as long as the criteria of Flood Affectation, Evacuation and Management & Design are met.

3.2 FLOOD AFFECTATION

The assessment criteria for flood affectation in the is:

"Engineers report to certify that the development (or potential development) will not increase flood affectation elsewhere"

We confirm that the proposed development will not increase flood affectation elsewhere, outside of the site. The development will only serve to improve flood affectation by providing a defined pathway for the stormwater to travel through the site and to the river.

3.3 EVACUATION

The assessment criteria for flood affectation in the is:

"Reliable access for pedestrians or vehicles required during a 100-year flood"

As can be seen from the hazard mapping, there will be safe access through scattered portions of minor inundation with a hazard level of 1 to Short Street. Hazard level 1 is classed as minor, or insignificant hazard with safe access possible for pedestrians and vehicles.

3.4 MANAGEMENT AND DESIGN

The assessment criteria for management and design is:

"Applicant to demonstrate that potential development as a consequence of subdivision proposal can be undertaken in accordance with this Plan"

All potential development resulting from subdivision proposal will be able to take place in accordance with the flood risk matrix requirements. All future building sites will be able to be constructed with flood levels higher than the required 1% AEP level plus freeboard, and storage of all materials will be able to be catered for so as not to become a flood risk.

4 CONCLUSION

After review of the model results and mapping output, we confirm that although the site is documented as flood affected in the 1% AEP flood event, this is only due to localised overland flows from drainage structures overflowing in Short Street and Market Street and flowing Northwards over the proposed site towards the Castlereagh River. The depth of overland flow is very minor, at 30mm or less depth.

With the proposed measures in place to mitigate the affects of the minor overland flow, we believe that the site should be categorised as a Medium Flood Risk, and all of the planning and development controls listed in the DCP Appendix A – Matrix 1 – Urban Flood Plains are able to be satisfied.