

NOTICE OF MEETING



BYRON SHIRE FLOODPLAIN RISK MANAGEMENT COMMITTEE MEETING

A Byron Shire Floodplain Risk Management Committee Meeting of Byron Shire Council
will be held as follows:

Venue	Conference Room, Station Street, Mullumbimby
Date	Tuesday, 24 March 2020
Time	2.00pm

Phillip Holloway
Director Infrastructure Services

I2020/436
Distributed 17/03/20

CONFLICT OF INTERESTS

What is a “Conflict of Interests” - A conflict of interests can be of two types:

Pecuniary - an interest that a person has in a matter because of a reasonable likelihood or expectation of appreciable financial gain or loss to the person or another person with whom the person is associated.

Non-pecuniary – a private or personal interest that a Council official has that does not amount to a pecuniary interest as defined in the Code of Conduct for Councillors (eg. A friendship, membership of an association, society or trade union or involvement or interest in an activity and may include an interest of a financial nature).

Remoteness – a person does not have a pecuniary interest in a matter if the interest is so remote or insignificant that it could not reasonably be regarded as likely to influence any decision the person might make in relation to a matter or if the interest is of a kind specified in the Code of Conduct for Councillors.

Who has a Pecuniary Interest? - a person has a pecuniary interest in a matter if the pecuniary interest is the interest of the person, or another person with whom the person is associated (see below).

Relatives, Partners - a person is taken to have a pecuniary interest in a matter if:

- The person's spouse or de facto partner or a relative of the person has a pecuniary interest in the matter, or
- The person, or a nominee, partners or employer of the person, is a member of a company or other body that has a pecuniary interest in the matter.

N.B. “Relative”, in relation to a person means any of the following:

- (a) the parent, grandparent, brother, sister, uncle, aunt, nephew, niece, lineal descends or adopted child of the person or of the person's spouse;
- (b) the spouse or de facto partners of the person or of a person referred to in paragraph (a)

No Interest in the Matter - however, a person is not taken to have a pecuniary interest in a matter:

- If the person is unaware of the relevant pecuniary interest of the spouse, de facto partner, relative or company or other body, or
- Just because the person is a member of, or is employed by, the Council.
- Just because the person is a member of, or a delegate of the Council to, a company or other body that has a pecuniary interest in the matter provided that the person has no beneficial interest in any shares of the company or body.

Disclosure and participation in meetings

- A Councillor or a member of a Council Committee who has a pecuniary interest in any matter with which the Council is concerned and who is present at a meeting of the Council or Committee at which the matter is being considered must disclose the nature of the interest to the meeting as soon as practicable.
- The Councillor or member must not be present at, or in sight of, the meeting of the Council or Committee:
 - (a) at any time during which the matter is being considered or discussed by the Council or Committee, or
 - (b) at any time during which the Council or Committee is voting on any question in relation to the matter.

No Knowledge - a person does not breach this Clause if the person did not know and could not reasonably be expected to have known that the matter under consideration at the meeting was a matter in which he or she had a pecuniary interest.

Non-pecuniary Interests - Must be disclosed in meetings.

There are a broad range of options available for managing conflicts & the option chosen will depend on an assessment of the circumstances of the matter, the nature of the interest and the significance of the issue being dealt with. Non-pecuniary conflicts of interests must be dealt with in at least one of the following ways:

- It may be appropriate that no action be taken where the potential for conflict is minimal. However, Councillors should consider providing an explanation of why they consider a conflict does not exist.
- Limit involvement if practical (eg. Participate in discussion but not in decision making or vice-versa). Care needs to be taken when exercising this option.
- Remove the source of the conflict (eg. Relinquishing or divesting the personal interest that creates the conflict)
- Have no involvement by absenting yourself from and not taking part in any debate or voting on the issue as of the provisions in the Code of Conduct (particularly if you have a significant non-pecuniary interest)

RECORDING OF VOTING ON PLANNING MATTERS

Clause 375A of the Local Government Act 1993 – Recording of voting on planning matters

- (1) In this section, **planning decision** means a decision made in the exercise of a function of a council under the Environmental Planning and Assessment Act 1979:
 - (a) including a decision relating to a development application, an environmental planning instrument, a development control plan or a development contribution plan under that Act, but
 - (b) not including the making of an order under that Act.
- (2) The general manager is required to keep a register containing, for each planning decision made at a meeting of the council or a council committee, the names of the councillors who supported the decision and the names of any councillors who opposed (or are taken to have opposed) the decision.
- (3) For the purpose of maintaining the register, a division is required to be called whenever a motion for a planning decision is put at a meeting of the council or a council committee.
- (4) Each decision recorded in the register is to be described in the register or identified in a manner that enables the description to be obtained from another publicly available document, and is to include the information required by the regulations.
- (5) This section extends to a meeting that is closed to the public.

BYRON SHIRE COUNCIL
BYRON SHIRE FLOODPLAIN RISK MANAGEMENT COMMITTEE MEETING

BUSINESS OF MEETING

1. APOLOGIES

2. DECLARATIONS OF INTEREST – PECUNIARY AND NON-PECUNIARY

3. ADOPTION OF MINUTES FROM PREVIOUS MEETINGS

- 3.1 Byron Shire Floodplain Risk Management Committee Meeting held on 26 November 2019

4. STAFF REPORTS

Infrastructure Services

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no-fill zone of Marshalls Creek floodplain65
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STAFF REPORTS - INFRASTRUCTURE SERVICES

Report No. 4.1 **Minutes of previous Byron Shire Floodplain Risk Management Committee Meeting**

Directorate: Infrastructure Services
Report Author: Dominika Tomanek, Executive Assistant Infrastructure Services
File No: I2020/431


Summary:

The previous minutes of Byron Shire Floodplain Risk Management Committee Meeting are attached to the report.

RECOMMENDATION:

That Committee note the report.

Attachments:

1 Minutes 26/11/2019 Byron Shire Floodplain Risk Management Committee, I2019/1928 , page 6  

REPORT

5 The minutes of the Byron Shire Floodplain Risk Management Committee Meeting held on 26 November 2019 are attached. The minutes were reported to the 12 December 2019 Council Meeting which resulted in resolutions 19-669.

19-669 Resolved: that Council adopt the following Committee Recommendation(s):

Report No. 4.1 North Byron Floodplain Risk Management Study Draft Document
File No: I2019/1832

Committee Recommendation:

1. That Council support the public exhibition of the Draft North Byron Floodplain Risk Management Study Attachment 1 and 2 (E2019/83311 and E2019/83313) from 20 January to 21 February 2020.
2. That Council delegate staff the authority to make minor amendments to the Draft North Byron Floodplain Risk Management Study documents, in consultation with support from the Floodplain Management Committee, prior to it going on public exhibition in January 2020.

(Lyon/Spooner)

Legal/Statutory/Policy Considerations

N/A

10

Financial Considerations

N/A

Consultation and Engagement

15

N/A

MINUTES OF MEETING

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10

BYRON SHIRE FLOODPLAIN RISK MANAGEMENT COMMITTEE MEETING

15

Venue	Conference Room, Station Street, Mullumbimby
Date	Tuesday, 26 November 2019
Time	2pm

20

Minutes of the Byron Shire Floodplain Risk Management Committee Meeting held on Tuesday, 26 November 2019

File No: Error! Unknown document property name.

PRESENT: Cr A Hunter and Cr M Lyon

Staff: James Flockton (Flood and Drainage Engineer)
Dominika Tomanek (Minute Taker)

Invited Members: Peter Mair (SES), and Martin Rose (Environment and Heritage),
Karl Allen

Community: Robyn Bolden, Rebecca Brewin, Steve Keefe, Duncan Dey and
Matthew Lambourne

Visitors: Ella Harrison (WMA Water), Katrina Smith (WMA Water)

Cr Lyon (Chair) opened the meeting at 2:09 pm and acknowledged that the meeting was being held on Bundjalung Country.

APOLOGIES:

Phil Holloway (Director Infrastructure Services)
Andrew Page (Cape Byron Marine Park)
Cr Richardson
Toong Chin (Environment and Heritage)
Cr J Hackett
Susan Skyvington

DECLARATIONS OF INTEREST – PECUNIARY AND NON-PECUNIARY

There were no declarations of interest.

ADOPTION OF MINUTES FROM PREVIOUS MEETINGS

Committee Recommendation:

That the minutes of the Byron Shire Floodplain Risk Management Committee Meeting held on 24 September 2019 be confirmed.

(Dey/Lyon)

The recommendation was put to the vote and declared carried.

Note: The minutes of the meeting held on 24 September 2019 were noted, and the Committee Recommendations adopted by Council, at the Ordinary Meeting held on 24 October 2019.

BUSINESS ARISING FROM PREVIOUS MINUTES

There was no business arising from previous minutes.

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

4.1 - ATTACHMENT 1

Report No. 4.1 **North Byron Floodplain Risk Management Study Draft Document**
File No: I2019/1832

Committee Recommendation:

1. That Council support the public exhibition of the Draft North Byron Floodplain Risk Management Study Attachment 1 & 2 - (E2019/83311 & E2019/83313) from 20 January to 28 February 2020.
2. That Council delegate staff the authority to make minor amendments to the Draft North Byron Floodplain Risk Management Study documents, in consultation with support from the Floodplain Management Committee, prior to it going on public exhibition in January 2020.

(Hunter/Lyon)

The recommendation was put to the vote and declared carried.

-
- 5 *There being no further business the meeting concluded at 4:00pm.*

Report No. 4.2 **Draft North Byron Floodplain Risk Management Study and Plan**
Directorate: Infrastructure Services
Report Author: James Flockton, Drain and Flood Engineer
File No: I2020/418

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Summary:

10 As per Council resolution the Draft North Byron Floodplain Risk Management Study has been to public exhibition for 28 days. 75 Submissions and 158 comments were received at the close of this process.





15 All comments have been addressed and The Draft North Byron Floodplain Risk Management Plan is now ready for committee review and public exhibition.

RECOMMENDATION:**Committee Recommendation:**

1. **That Council support the public exhibition of both the Draft North Byron Floodplain Risk Management Study and Plan documents from 27 April to 25 May 2020.**
2. **That the community should be commended for the interest and time they have taken to review and comment on the first exhibition stage of this project.**

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Attachments:

- 1 North Byron FRMS&P - FRMS Consultation Comments Report, E2020/19721 , page 13  
- 2 North Byron FRMS&P - Draft Floodplain Management Plan, E2020/19724 , page 49  

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REPORT

At Council meeting on 12 December 2019 the following was resolved:-

5 *That Council adopt the following Committee Recommendation(s):*

*Report No. 4.1 North Byron Floodplain Risk Management Study Draft Document
File No: I2019/1832*

10 *Committee Recommendation:*

1. *That Council support the public exhibition of the Draft North Byron Floodplain Risk Management Study Attachment 1 and 2 (E2019/83311 and E2019/83313) from 20 January to 21 February 2020.*

15 2. *That Council delegate staff the authority to make minor amendments to the Draft North Byron Floodplain Risk Management Study documents, in consultation with support from the Floodplain Management Committee, prior to it going on public exhibition in January 2020.*

20 *(Lyon/Spooner)*

As per this Council resolution the Draft North Byron Floodplain Risk Management Study was updated and has been to public exhibition for 28 days.

25 75 Submissions and 158 comments were received at the close of this process. It is noted this was an overwhelming amount of comments; previous flood reports have not received been close to this level of interest. This kind of interest helps the final document become a more accepted and much better plan that it would be without these comments and the community should be commended for their interest in this project.

30 Consultant WMA Water have now reviewed and responded to all the comments.

The complete submission report is provided at attachment 1 (E2020/19721).

35 Where possible the Draft North Byron Floodplain Risk Management Study has been amended appropriately. If this was not possible the reasons for no amendment have been given in the submissions report.

Following completion of amendments noted above The Draft North Byron Floodplain Risk Management Study and Plan is now ready for committee review and public exhibition.

40 In consultation with staff, WMA Water have prepared the Draft Floodplain Management Plan in accordance with assessment results, public consultation results and various discussions at previous committee meeting. This should result in a Draft Floodplain Management Plan that can be largely supported by the committee.

45 The Draft North Byron Floodplain Risk Management Plan is provided at attachment 2 (E2020/19724). It is proposed that that both the updated draft Study and Plan documents be provided in order to show the community how the study has been changed following public exhibition and to provide context to those reading the Floodplain Management Plan.

50 The updated Study document is not currently complete, however, it is planned to be complete when the committee meeting minutes are reported to Council for approval to exhibit both to the community. All amendments will be made in accordance with the report provided at attachment 1.

55

Key issues

This project is now on a critical path in order to allow the current Council to consider the final adoption of the Draft North Byron Floodplain Risk Management Study and Plan in their current term. The following milestones remain.

Draft Plan to Council for Exhibition approval	23/04/2020
Plan Exhibition for 4 weeks (All of May)	25/05/2020
Council report for Final Draft Plan to Council for adoption– Report to manager deadline	01/06/2020
Grant Milestone - Flood Risk Management Study & Plan Adopted	14/06/2020
Final Report to DPIE	14/06/2020
Final Draft Plan to Council for adoption	25/06/2020

Next steps

- 10 Upon completion of the public exhibition period the Draft North Byron Floodplain Risk Management Study and Plan will be amended as required and presented to Council for adoption as per the above milestones.

- 15 The committee may request the above timeline be changed to allow the committee to review the exhibition comments and report amendments prior to the final Draft North Byron Floodplain Risk Management Study and Plan being presented to Council. However, it is noted that this will extend the project period into a period when the Council enters caretaker mode, therefore, the plan will not be able to be adopted until after a new Council is elected.

- 20 All committee members will have the ability to comment on the final documents via the Council meeting business paper. Should an issue arise that cannot be resolved without committee support staff will have no option but delay the project and hold a meeting of the committee.

Legal/Statutory/Policy Considerations

- 25 NSW Councils are expected to prepare Floodplain Risk Management Studies and Plans for flood prone catchments within their local government areas. These documents must be prepared in accordance with State Government Policy.

- 30 The NSW Floodplain Development Manual 2005 is the current policy used by State Government for the preparation of such documents.

This project is following the methods prescribed in the NSW Floodplain Development Manual for completing Floodplain Risk Management Studies and Plans.

35

Financial Considerations

There are not financial issues with this stage of the project.

Consultation and Engagement

As per public exhibition process.

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

4.2 - ATTACHMENT 1

North Byron Floodplain Risk Management Study - Consultation Report

Comment ID	Comments	Response	Responsibility	Open / Closed	Outstanding Action
1	interested in use and roll out of no fill zones	Discussion - response not required	WMA	Closed	
2	thinks CDM should be higher priority	Included in MCA as moderate community support	WMA	Closed	
3	Against levee in Billinudgel	Neither options (BL, CB02) which included a levee for Billinudgel have been recommended by the FRMS	WMA	Closed	
4	Supports WFG	This has been included in the MCA with moderate support from the community. The revised rank is now rank 15 and is a moderate priority action.	WMA	Closed	
5	Reading Bay - rock wall was meant to be removed, sedimentation	The issue of sediment transport is beyond the scope of the FRMS. Modelling has shown that channel dredging and rock wall alterations make negligible impact on flood levels in large events (1% AEP) and therefore have not been recommended. However, an action has been added to the draft FFMP for "Council to consider the development of a sediment transport model to investigate modification to the rock walls for the purpose of improved sediment transport – as part of the Coastal Management Program - Scoping Study for Cape Byron to South Golden Beach." This action has been included in Section 11.4.3 of the FRMS as Option RW02 and is a low priority action.	WMA	Closed	
6	Canal link to Marshalls Creek major constraint	The model includes a channel 6m wide and 1.5m deep in this location. Dimensions confirmed with Council as appropriate.	WMA	Closed	
7	other properties potential for house raising in Billi	Text has now been clarified (under Section 11.6.1, ASSESSMENT) there may be other properties eligible. Wording to this effect was initially included however has been strengthened.	WMA	Closed	
8	main golf course weir is not the Terara court one, near 17th hole near works depot	We included all the golf course weirs in the model for the design events, however the mitigation option only considered lowering of the Terara Court weir. This option showed minimal difference as for a 1% AEP flood event the weir is drowned out. We expect this will be the same for other weirs.	BSC	Closed	
9	Ocean shores larger than Mullumbimby and is a gazetted town	Section 1.1. has been edited to clarify Ocean Shores is larger and than Mullumbimby and that only Mullumbimby, Brunswick Heads and Ocean Shores are towns. Section 2.1 has also been updated to reflect this. Section 2.5 refers to Mullumbimby as the largest local centre. Ocean Shores is primarily residential so this section has not been changed.	WMA	Closed	
10	Request population numbers from Council	The latest 2016 census was used in determining population numbers and Council have advised this is the most relevant dataset for the purposes of the FRMS.	BSC	Closed	
11	clarify in the report that removal of training walls not community suggestion	Text has been added (under Section 11.4.3, Option - TW) to clarify this was not a suggestion of the community.	WMA	Closed	

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

4.2 - ATTACHMENT 1

12	Billinudgel Nature Reserve is located in Ocean Shores and that is what the community call it	The report currently does not mention the Billinudgel Nature Reserve, however there is commentary that the catchment is zoned as rural land, residential, national parks and nature reserves and coastal habitat zones. The following sentence has been included in Section 2.4.2. - <i>The Billinudgel Nature Reserve, located within Ocean Shores, is considered to have environmental significance and protects important remnant coastal habitat.</i>	WMA	closed	
13	general disappointment ocean outlets discounted	The results from the modelling of preliminary mitigation options have now been included in Appendix R. Results from the ocean outlets mitigation option are shown in Figure R-10.	WMA	Closed	
14	Add in DPIE to list of acronyms Update wording to:	DPIE added and other acronyms amended.	WMA	Closed	
15	Council amend DCP to incorporate planning recommendations of FRMS Further detailed assessment of Saltwater Creek upgrade assessment and mitigation options for Mullumbimby	Updated as suggested	WMA	Closed	
16	1.1 study area approximately 55km ² - too small	We have confirmed that the study area included in the report is correct. This area represents the actual hydraulic model domain. The catchment area is much larger.	WMA	Closed	
17	Figure 1 should also show catchment	Figure 1 (Study Area) has been updated to include the catchment boundary.	WMA	Open	Keep open to ensure brought in to final.
18	2.4.2 updated, Coastal management act 2018 replaced state environmental planning policy 2014	Section 2.4.2 updated.	WMA	Closed	
19	2.4.2 - refers to a Section 0 (might also be just above Heading 2.6.2)	Section 2.6.1 has been amended. Correct reference was Section 11.4.3.	WMA	Closed	
20	3. add in North Byron Flood Study, 2016. BMT WBM plus discussion	Section updated to include discussion on North Byron Flood Study, 2016, BMT (new Section 3.9).	WMA	Closed	
21	6.3 The housing Code is part of the 'SEPP Exempt and Complying Development' discussed in section of 6.4 and should be a sub section on the SEPP	The SEPP is now discussed in Section 6.3 and the section on the Housing Code is sub-section 6.3.1 .	WMA	Closed	
22	remove "the assumed" in 6.6.3.	Updated. Note it is now Section 6.5.3.	WMA	Closed	
23	Table 7. Floodway definition parameters , V>0.35 m/s or > 1m/s, V> 0.25 m/s or > 1 m/s	This has been clarified that the parameters are both VD>0.35m ² /s and V > 0.35m/s, or V > 1m/s.	WMA	Closed	
24	"Table 12 and Table 13 below " , commented "Figure 25"??	Section 7.4.1 Updated.	WMA	Closed	
25	Table 15, location 5, Road level 1.13mAHD, "Pacific Motorway not that low"	Updated to correct value of 3.73mAHD		Closed	
26	8.1.2. "available for future" ??	Section 8.1.2 has been updated - missing word "development" now added	WMA	Closed	
27	10.1 , change diagram 4 to 12	Diagram numbering updated throughout.	WMA	Closed	
28	11.4.2 Temporary Flood Barriers and Dams not listed in table 29	Table 36 represents management options considered. The structural options included in this table are the options where a possible location was identified and the option was run through a preliminary assessment. No locations were identified for temporary flood barriers or dams to be considered. A description of each has been included in Section 11.4 to ensure it is clear no locations were identified.	WMA	Closed	
29	11.5.1 update "draft a" to "review and update the"	Section 11.5.1 updated.	WMA	Closed	

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

4.2 - ATTACHMENT 1

30	11.5.2.1 - developing n flood	Section 11.5.2.1 has now been updated.	WMA	Closed	
31	11.5.4. - logistically	Amended - logistical	WMA	Closed	
32	11.6.1 dot points, add point "Funding is only available for properties where the building were approved and constructed prior to 1986"	Section 11.6.1 updated.	WMA	Closed	
33	11.6.1 costs of house raising in Lismore, 2019 were 120k	Text amended to note that prices range from about \$60k to \$120k. We did an upper (\$90k) and lower test (\$60k) (both with 20% contingency) to show the impact different costs could have on the cba.	WMA	Closed	
34	11.6.1 Summary: "a list of the identified properties be provide to council as part of hand over "	A comment has been included under Section 11.6.1 SUMMARY	WMA	Closed	
35	11.6.1 table 39 : "a list of the identified properties be provide to council as part of hand over "	A comment has been included under Section 11.6.1 SUMMARY	WMA	Closed	
36	11.6.2 Table 42, consider "Funding is only available for properties where the building were approved and constructed prior to 1986"	A comment has been included under 11.6.2 ASSESSMENT.	WMA	Closed	
37	Unsure which section - 'In general, the current zones are consistent with the potential constraints and can be managed through development controls. The expectation to this is three potential areas, as shown in Figure 89. - Is the hazard mapping for the 1% Flood event?	This figure (now Figure 105) has been updated to specify 1% AEP event.	WMA	Open	ensure in final
38	table 44 / 37 - Should it be 0.2% AEP ?	Error updated - 0.2% AEP	WMA	Closed	
39	12.1 Billinudgel Infrastructure upgrade - more detailed investigation look at practical limits of raising Wilfred St. or sections of Wilfred St. to achieve better flood access (not focused on 1% AEP). Possibility of making it a rising road? In combination with infrastructure works	Have updated both Section 12.1.2, Section 12.2 and Section 11.5.4 to include more detail	WMA	Closed	
40	12.1 Saltwater Ck -add in discussion Mullumbimby is hot spot with lots of properties flooded in 2% and 1% AEP floods. Model in saltwater Ck area has creek in 1D and has different 2D grid sizes on either side of creek making it difficult to model changes in this area. update model for better results. Removal of railway embankment significant impact on flood levels so look at combinations of mitigation options with saltwater Ck modifications.	Additional wording included in 12.1.	WMA	Closed	
41	Figure 25D, concern about Orana Rd as an evacuation route, The study notes that the low point at the intersection of Orana Road and Narooma Drive becomes impassable in times of flood. The study also notes that a large proportion of Ocean Shores residents are new to the area and unfamiliar with flooding patterns. So why encourage evacuees to use Orana Road? "It would seem, to me, to be more sensible to promote the longer but safer route - Brunswick Valley Way, Rajah Road & Warrambool Road - to reach the OSCC evacuation centre." Is that a better option.	Section 7.4 and Figure 25 assess the risk of the current local flood plan and this is why these evacuation routes have been included. This assessment of existing arrangements provides the information needed to identify constraints or areas for improvement. Section 9.3 discusses immunity of evacuation routes and centres in more detail and recommendations are made based on the findings. This information is prepared and provided to the SES to update the Local Flood Plan based on the information in this report. A clarification sentence has been added recommending the safer alternate route be promoted as the primary route (section 9.3.2 and Section 11.5.1).	WMA	Open	email sent to BSC - await advice

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

4.2 - ATTACHMENT 1

42	<p>34 Argyle St, Mullumbimby: is this house in the list for "voluntary house raising", if not what is the criteria? If not, could it be reviewed with a view possibly apply for funding under the NSW government VHR, which has a funding ratio of \$2 State to \$1 Council or local contribution . Even if the 33% council funding was funded by the home owner, it would be a better situation than not doing.</p> <p>Note: the report mentions very little about the NSW Government funding in the cost benefit analysis of for "voluntary house raising", this should be included in the cost/benefit analysis.</p>	<p>The criteria for properties considered for voluntary house raising is included in Section 11.6.1.</p> <p>This section has been written in accordance with the NSW Government VHR funding scheme and should the scheme be implemented is intended to be implemented through the NSW Government scheme. The criteria included in the report has been taken directly from the NSW Government scheme.</p> <p>The report acknowledges that the property database used to identify a preliminary list has limitations and a more thorough investigation would be required as part of the program.</p> <p>The cost benefit analysis considers the costs, irrespective of where the funding comes from, as is consistent with best practice economic analysis. Consideration of funding is including in the multi-criteria assessment. Further detail of the NSW grant scheme has been added to the discussion under Section 11.6.1.</p>	WMA	Closed	
43	<p>I live at 8 Park Street New Brighton and my house has recently been raised above the 1 in 100 flood level. I partially used the \$10,000 grant I was allocated in 2001. When I receive my final certification for the house raising I will seek the payment from Council possibly at the end of the month.</p> <p>During the last flood I stayed in the dwelling as I had habitable rooms above the flood level and just waited till the tide turned and the flood waters subsided. I parked my car in Gaggin Street which is flood free and if I wanted to I could have walked to the beach and gone for as far as I liked in a North , South direction. This opportunity is available to most people in New Brighton.</p>	<p>Thanks for the comment and useful local knowledge. We have included this local knowledge within Section 7.8.3 noting that this ability to escape on foot is likely available to residents in New Brighton.</p>	WMA	Closed	

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

4.2 - ATTACHMENT 1

44	<p>smaller flood events: "I suggest that Council considers kerbing and guttering all the streets in New Brighton, as Council has allowed uncontrolled parking at the beach accesses and the New Brighton farmers market and the existing swale drains are basically ineffective as the gradient of the drains have been compromised by the number of cars parking across the drains or moving the market to somewhere like the parking lot of Splendour in the Grass at Yelgun."</p>	<p>Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council.</p> <p>A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc.</p> <p>Given the extensive community support for drainage maintenance, this has been reflected in the multi criteria assessment under community support. The revised rank of the option is now 20 and is a low priority action.</p>	WMA	Closed	
45	<p>additional note: the draft plan indicates the existence of dwellings south of north head road where dwellings are not permitted and where they have previously been destroyed.</p>	<p>Thanks for comment. The property database was developed both by surveyors and remotely, and therefore if there are still remaining shacks that aren't allowed these would have been included. We had made a note in Section 7.8.3 that these properties are no longer legally allowed.</p>	WMA	Closed	
46	<p>Rock walls preventing sand to get back out to the beach where it belongs. This is also causing beach erosion as well as silting up the river mouth making it dangerous for local boaters. The river doesn't need to be dredged. Just remove part of the rock wall 50 m or more of the rock wall blocking the entrance to the north arm of the river (Marshals creek)open up two outlets upstream that where blocked by development .</p> <p>Beach erosion and marina: remove components of the north marina arm, allowing for sand movement upstream. (<400K) http://brunswickvalley.com.au/flood-history/index.htm</p>	<p>The issue of sediment transport is beyond the scope of the FRMS. Modelling has shown that dredging and wall alterations make negligible impact on flood levels and therefore have not been recommended. However, an action has been added (Option RW02) to the draft Flood Plan for "Council to consider the development of a sediment transport model to investigate modification to the rock walls for the purpose of improved sediment transport – as part of the Coastal Management Program - Scoping Study for Cape Byron to South Golden Beach." This is discussed further in Section 11.4.3.</p> <p>The Ocean Outlets have been modelled both separately and as part of the combined option CB01. These are discussed in Section 11.4.3 Option OO and Section 11.4.10 CB01. While the presence of ocean outlets may provide a benefit for some smaller catchment dominated flood events, they provide minimal influence on flood behaviour of larger flood events or ocean dominated events.</p>	WMA	Closed	

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47	key issues for flooding are Spring tide LAT At full moon, Storm surge (Example Cyclone Debbie) and large amount of water Heavy rain over a long period before hand. To say the ocean is going to inundate the shire because of a rock nearly 1 km away from the river mouth is just not true . Can barely get small boat in through the river mouth Because it's so shallow.	Thanks for the comments, we aren't sure which rock wall is being referred to though? Are you able to clarify. When we discuss ocean outlet we consider flood event scenarios that are catchment dominated and would allow water to escape and scenarios that have a high tide or storm surge. In these instances there is potential ocean outlets would allow ocean water in and increase inundation in these lower parts of the floodplain.	WMA	Open	Request clarification
48	Support for dredging - In any case Bashforths said they would do it for free if they could use the sand that's unnaturally deposited in the creek.	We have incorporated your comment as community support in the multi criteria assessment.	WMA	Closed	
49	1. Raising river St.: will induce flooding in other areas of New Brighton , allows cason's lane residents to evacuate but doesn't aid Pacific Street. Cannot be considered in isolation from drainage issues inherent in the rest of the road system.	Thanks for the comment. Raising River Street alone with no mitigation works will cause unacceptable impacts. Option RM03 that considers raising River Street identifies these widespread impacts. This assessment is a preliminary assessment only and the purpose is to understand potential benefits and constraints to identify options that could be considered further as part of a more detailed investigation. This option recommends that a feasibility assessment is required to investigate design options that mitigate any adverse impacts, this will likely include looking at improved drainage as an option. Additional commentary (under section 11.5.3 SUMMARY) has been added detailing that this option would only be an option if appropriate mitigation measures were investigated.	WMA	Closed	
50	2. Evacuation centre in Gaggin or Terrace Street, Who can access it (not pacific street residents), no public or community assets or vacant land there. All high end residential, ? How will this happen , a house bought back by the council .	Thanks for the information. This has been updated to say ' <i>Noting there is no available land or council owned buildings for an evacuation centre, NSW SES and Byron Shire Council could investigate a new evacuation point along Gaggin Street or Terrace Street to evacuate residents.</i> '	WMA	Closed	
51	Phone call - Concerned about the Marshalls Creek no fill zone included in the report. If no fill zones are to be investigated these should be nuanced to areas of impact.	Response provided against written submission	WMA	Closed	
52	Would like to develop property in the future and would like to know how no fill zones will impact them. Council to follow up.		BSC	Open	to advise BSC
53		Response provided against written submission	WMA	Closed	

54	<p>had sent an email with comments - check these have been included.</p> <p>Section 2.6.1., about the Readings Bay rock walls, says 'The eastern opening is 42m wide however comprises a low level rock wall which limits its operability to large, infrequent events.' This is not correct - the low level wall is some distance from the eastern opening, and operates separately from it. The eastern opening is probably about 130m2 cross-section area at a water level of 1mAHD, while the internal wall, at 0.4mAHD and 300m length has a cross-section area of 180m2 at 1mAHD water level. This opening carries tidal flow any time the tide is higher than 0.4mAHD, and carries flood flow in any flood that is higher than high tide level. In a flood event, there is a greater flow path above the internal rock wall than there is through the eastern opening. A flood study by Cardno and Davies in 1984 said 'it was decided to omit the low training wall from any future considerations since, at the flood levels of interest, it would function as an extremely heavily submerged weir and thus have little influence of flood levels upstream.' That was 35 years ago, but it seems we have to keep repeating it over and over again!</p> <p>Section 2.6.2. says 'In larger flood events some of the water from Mullumbimby Creek enters the Brunswick River, but much of the water flows to Kings Creek and Saltwater Creek.' Looking at the peak flood levels, the only ones I have access to, the levels in Mullumbimby Creek appear to be lower than the level at the junction with the river, indicating that water may be flowing from the river back up Mullumbimby Creek, and into Kings and Saltwater creeks. Does this actually happen during the course of a flood, or is it just a result of computed levels at one arbitrary point in the flood event? This might be relevant to consideration of any Saltwater Creek enhancement.</p>	<p>•We have modified Section 2.6.1 to read: 'The eastern opening is 42 m wide and is tidal for tidal heights greater than 0.4 m AHD. The internal wall is a low level rock wall further north-west of the eastern opening and is approximately 300m in length. The height of this rock wall ranges from 0.2 mAHD to 0.4 mAHD and is tidal for heights greater than 0.4 mAHD. During flood events, the low level rock wall operates primarily as a submerged weir.'</p> <p>•Modelling has been checked and can confirm that there is back water from Brunswick River into Mullumbimby and then in to Saltwater Creek at the peak.</p>	WMA	Closed	
55	Orchard place fill - looks flooded but has been filled. The report says this was included but it was filled to the 1% so should be flood free.	WMA didn't have the Orchard Place topographical survey at the time of modelling and instead the development was included as change to the model roughness. Orchard Place and a number of other recent developments are being included in the model as updates to the topography as a variation for council. This work will identify if the additional topographic changes have any significant impact on the 1% AEP design flood level. These results will also be used for the purposes of defining the flood planning level	WMA	Closed	
56	CD02 - Mullumbimby west - reduction in levels that look like they should be increased. Check timestep to see why.		WMA	Open	WMA to check
57	Support for no fill zones to be considered in Mullumbimby. Concerned with development at Lot 22. Concerned this will increase flood risk for Mullumbimby community.	Further work is being carried out with regards to the use of fill in future development. The findings will be incorporated into the final FRMS. The proposed affordable housing development at Lot 22 is currently being investigated as part of another study commissioned by council. There has been a number of concerned comments relating to Lot 22 and these have been collated and provided to council to consider as part of this separate study.	WMA	Closed	
58	Will be providing a written response also.	addressed against written discussion	WMA	Closed	

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59	Concern for South Mullumbimby affordable housing precinct. Would like to see this designated a No fill zone.	The proposed affordable housing development at Lot 22 is currently being investigated as part of another study commissioned by council. There has been a number of concerned comments relating to Lot 22 and these have been collated and provided to council to consider as part of this separate study.	WMA	Closed	
60	Support for further investigation into no fill zones	Further work is being carried out with regards to the use of fill in future development. The findings will be incorporated into the final FRMS. This commented as been considered as support for PM10 and loose support for PM06. This support has been included in the multi criteria assessment as support from the community.	WMA	Closed	
61	Support for changes to the DCP so filling is not the default	Further work is being carried out with regards to the use of fill in future development. The findings will be incorporated into the final FRMS. Considered support for PM06. This support has been included in the multi criteria assessment as support from the community.	WMA	Closed	
62	1989 flood study and North Byron Flood Study identified expansion issues with Mullumbimby Industrial estate - take a precautionary approach to further development due its high hazard	Further work is being carried out with regards to the use of fill in future development. The findings will be incorporated into the final FRMS.	WMA	closed	
63	Support for further investigation of Mitigation Option SC3 - suggest that Jubilee Avenue and Myokum St culverts be replaced with bridges	Considered support for further investigation into Option SC. It has also been noted (in Section 12.1.4) that there are additional options that could be worth exploring.	WMA	Closed	
64	Support for mitigation option RR if work is done to mitigate (e.g. levees) negative impacts to properties on eastern side of railway	Considered support for further investigation into Option SC (of which Option RR was one variation). An additional comment has been included (in Section 12.1.4) explicitly saying any mitigation works considered should ensure there are no negative impacts to properties elsewhere in the floodplain.	WMA	Closed	
65	Support for increasing environmental flows in Saltwater Creek	Considered support for Option SC - there has been additional commentary included (in Section 12.1.4) that the community support an option that includes improved environmental flows in Saltwater Creek.	WMA	Closed	
66	Support for drainage improvements in Avocado Court	We have included this as general support for the option within the multi criteria analysis. However, due to the contrasting support and opposition for this option we have kept the weighting as neutral.	WMA	Closed	
67	Option SC3 suggestions: - could include large openings under the train line south of Saltwater Creek - widening of the kings creek bridge on Mullum Road	Considered support for further investigation into Option SC. It has also been noted (in Section 12.1.4) that there are additional options that could be worth exploring.	WMA	Closed	
68	As the old Mullumbimby hospital has been demolished - a new area for Helicopter landing needs to be established not just for floods but also for general emergencies.	Agree. There was a comment originally around the suitability of the showgrounds however, this has now been changed to (under section 9.3.6) <i>'The roof of the old Mullumbimby Hospital used to be suitable for helicopters to land, however as the hospital has now been demolished the only alternate option is the Mullumbimby Show Grounds. As these grounds are flood prone, a new area should be investigated that is appropriate to land a helicopter during flood events.'</i>	WMA	Closed	
69	support a review of Mullumbimby evacuation centres	Considered support for option RM07. This support has been included in the multi criteria assessment as support from the community.	WMA	Closed	

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70	support for drainage maintenance	Considered support for Option FDC and Option CDM. This support has been included in the multi criteria assessment as support from the community.	WMA	Closed	
71	general disappointment on management of stormwater infrastructure across the catchment. Notes any mitigation options including widening of creeks or extending drainings will also require regular maintenance.	<p>Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council.</p> <p>A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc.</p> <p>Given the extensive community support for drainage maintenance, this has been reflected in the multi criteria assessment under community support with the highest possible support. The revised rank of the option is now 20.</p>	WMA	Closed	
72	support for government buy backs or raising buildings on properties	Considered support for Option PM01 and PM02. This support has been included in the multi criteria assessment as support from the community.	WMA	Closed	
73	<p>Additional letter comments:</p> <ul style="list-style-type: none"> - please clear drains and creeks. With heavy rain the water cannot get away. - Every time it rains I'm frightened. 	<p>Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council.</p> <p>A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc.</p> <p>Given the extensive community support for drainage maintenance, this has been reflected in the multi criteria assessment under community support with the highest possible support. The revised rank of the option is now 20.</p>	WMA	Closed	
74	No additional comments	none required		Closed	

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	<p>Additional letter comments:</p> <p>75 - Gutters on McGoughans Lane from Tincogans St, to Tram st need regular maintenance. The gutters/drain north of woolworths also needs regular clearing.</p> <p>- drainage maintenance could be a program for the whole town</p> <p>- All future development must take into the cumulative effects of climate change e.g. Lot 22, Ann Street</p>	<p>Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council.</p> <p>A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc.</p> <p>Given the extensive community support for drainage maintenance, this has been reflected in the multi criteria assessment under community support with the highest possible support. The revised rank of the option is now 20.</p> <p>The proposed affordable housing development at Lot 22 is currently being investigated as part of another study commissioned by council. There has been a number of concerned comments relating to Lot 22 and these have been collated and provided to council to consider as part of this separate study.</p>	WMA	Closed	
76	Incomplete version of MRA letter	Comments addressed through responding to the MRA letter.		Closed	
77	<p>Additional letter comments:</p> <p>- Lobby Federal Government for funds to implement flood mitigation.</p> <p>- Economic analysis due to the costs of climate change, locally, state, federal.</p> <p>- Believe it will be significantly less costly than doing nothing and dealing with the consequences.</p>	<p>We agree it is important to consider the impacts from climate change to fully understand the risk now and in the future.</p> <p>There is a very strong funding program for flood mitigation in New South Wales and the options considered in this study have been assessed in a way that is consistent with the requirements of this funding program. While there will need to be additional investigation into these options (e.g. further optioneering into design of the structural options or confirming which properties for voluntary purchase or house raising etc.) the work in this study will support Byron's ability to request funding in the future.</p> <p>Inclusion of options within this FRMS is the first step to access funding. NSW Treasury guidelines require the use of a 7% discount rate in cost benefit analysis. This essentially means benefit beyond about a 30 year time period are reduced to zero. This means even if we included a changing future climate in our economic analysis, it would show no benefit in "Present Value". To counteract this, the MCA explicitly considers viability under future climate change - to ensure these benefits are captured.</p>	WMA	Closed	

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78	Additional letter comments: - general requests for something to be done	Thanks for the letter and useful comments. We have made a number of additions and changes (as outlined in item 59 to item 72) to try and address community concerns or further emphasise where there is community support.	WMA	Closed	
79	Additional letter comments: - Lack of warning / no warning for cyclone Debbie. - Lost power and telephone, home got flooded. - Previously had not been flooded for the 35 years they lived there. - Should have had information and it should be known in advance to be better prepared.	Thanks for the letter and useful comments. We have made a number of additions and changes to try and address community concerns or further emphasise where there is community support. Specifically, we have highlighted how important improved emergency response planning and early warning is to the North Byron community. We have considered this comment to be support for Option RM02 which looks at improving flood warning and emergency response strategies. We have also included this comment as support for PM09 which looks at providing flood information via an online geographical information system. This support has been included in the multi criteria assessment.	WMA	Closed	
80	No additional comments			Closed	
81	Additional letter comments: Support the letter expect Option AC for the following: - no home have experienced above floor since development in the early 70's - road drains and overland flow-paths have coped with previous flood events - does not believe report conclusions that option will reduce flood levels - bruns river height filled basin on southern side of showground then filled showground itself - overflowed length of chinible, avocado, grevillia, kurrajob and hibiscus. - modelled is flawed because no accurate water level at Fed Bridge because gauge failed. - further investigation and modelling should be conducted before \$550,000 is spent. - money could be better spent on flood barriers at Fed bridge and railway bridge to minimise log jams	Thanks for the letter and useful comments. We have made a number of additions and changes to try and address community concerns or further emphasise where there is community support. Within the multi criteria analysis, we have incorporated the varying degrees of support and opposition from the community for Option AC. The modelling done as part of this study was a feasibility assessment only to understand which options have potential and should be recommended for further study. Further investigation and modelling is a requirement for all options recommended in the plan. However, to ensure this is clear we have included additional text in Section 12.1.3 detailing that further investigation and modelling is required to understand the flood behaviour in more detail.	WMA	Closed	

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82	<p>Additional letter comments:</p> <p>- supports letter except for Option AC because does not believe AC will make a difference</p>	<p>Thanks for the letter and useful comments. We have made a number of additions and changes to try and address community concerns or further emphasise where there is community support. Within the multi criteria analysis, we have incorporated the varying degrees of support and opposition from the community for Option AC.</p> <p>The modelling done as part of this study was a feasibility assessment only to understand which options have potential and should be recommended for further study. Further investigation and modelling is a requirement for all options recommended in the plan. However, to ensure this is clear we have included additional text in Section 12.1.3 detailing that further investigation and modelling is required to understand the flood behaviour in more detail.</p>	WMA	Closed	
83	<p>Additional letter comments:</p> <p>- evacuation centres in town are not accessible to residents crossing flooded areas and may also be subject to flooding. Suggest establishing additional centres.</p> <p>- Communication re. location and extent of flooding must improve considerable and be updated constantly.</p>	<p>Thanks for the letter and useful comments. We have made a number of additions and changes to try and address community concerns or further emphasise where there is community support.</p> <p>The need for new evacuation centres in Mullumbimby was identified in the study. We have included this response as support for Option RM07 which discusses a need for new evacuation centres in Mullumbimby and further than that - a detailed evacuation assessment for Mullumbimby.</p> <p>Option RM02 focuses on improving flood warning and emergency response in the North Byron floodplain. Part of this recommendation is for NSW SES and Byron Shire Council to consider development of an online system where flood warnings could be easily accessed and regularly updated.</p> <p>We have also included this comment as support for PM09 which looks at providing flood information via an online geographical information system.</p>	WMA	Closed	
84	No additional comments			Closed	

85	<p>Additional letter comments:</p> <p>what mitigation options are considered for Rush Court Mullum</p> <p>What warnings and alerts? How often are the river gauges checked?</p> <p>What is done to manage huge cut logs being left on riverbanks?</p> <p>No help was offered after the event for clean up. No explanation was given. No alert was made. People were traumatised.</p>	<p>Thanks for the letter and useful comments. We have made a number of additions and changes to try and address community concerns or further emphasis where there is community support.</p> <p>One of the significant changes is the additional commentary we have included around the communities concern for drainage upgrades and maintenance. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council.</p> <p>A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc.</p> <p>Given the extensive community support for drainage maintenance, this has been reflected in the multi criteria assessment under community support with the highest possible support. The revised rank of the option is now 20.</p> <p>The options included in Section 11.5 looking are response modification measures. These measures include things like improving warnings and alerts. A separate project, the Flood Warning Network for North Byron, is specifically looking at improving the warning network within North Byron. We have considered a number of other measures that will also support this. There has been a number of comments supporting RM02 which looks at improving flood warning and emergency response and this support has been captured in the multi criteria</p>	WMA	Closed	
86	<p>Additional letter comments:</p> <p>- questions if there is a problem with structural integrity of pipes in along backfence on Kurrajong street.</p> <p>- wants more maintenance and clearing of gutters and pipes</p> <p>- wants to know why council allowed development to occur in flow path from grevillea avenue to pine avenue</p> <p>- does not support drainage improvements for Avocado Court</p>	<p>Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council.</p> <p>A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc.</p> <p>Given the extensive community support for drainage maintenance, this has been reflected in the multi criteria assessment under community support with the highest possible support. The revised rank of the option is now 20.</p>	WMA	Closed	

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87	<p>Additional letter comments:</p> <ul style="list-style-type: none"> - understands responsibilities around maintaining, but has to be taken care of - waterways in a deplorable state 	<p>Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council.</p> <p>A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc.</p> <p>Given the extensive community support for drainage maintenance, this has been reflected in the multi criteria assessment under community support with the highest possible support. The revised rank of the option is now 20.</p>	WMA	Closed	
88	<p>Additional letter comments:</p> <ol style="list-style-type: none"> 1. Lot 22 must not proceed. Will increase flooding. 2. more building and hard surfaces allowed in mullum means less land available for absorption. 3. I feel there should not be any more development until it can be proved infrastructure can cope with flooding, parking and water supply. 4. the street and gutters and drains should be kept free of debris. 	<p>The proposed affordable housing development at Lot 22 is currently being investigated as part of another study commissioned by council. There has been a number of concerned comments relating to Lot 22 and these have been collated and provided to council to consider as part of this separate study.</p> <p>Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council.</p> <p>A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc.</p> <p>Given the extensive community support for drainage maintenance, this has been reflected in the multi criteria assessment under community support with the highest possible support. The revised rank of the option is now 20.</p> <p>We agree that more development without considering the impact on flooding will only increase the flood risk. The cumulative development scenarios assessed looked at the impact future development could have on the flood risk. Since receiving community feedback we have undertaken additional modelling to further understand which areas are driving change. This additional modelling work will allow for more nuanced recommendations in where there should be no</p>	WMA	Closed	

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89	<p>Additional letter comments:</p> <ul style="list-style-type: none"> - development of lot 22 must not proceed. Alternative sites should be found for affordable housing. Concerned about flooding as a result of filling on lot 22. Lot 22 is a valuable asset for sporting / playing fields - corner of jubilee avenue and myokum street needs drainage works. In recent rain Myokum st built up badly with water. 	<p>The proposed affordable housing development at Lot 22 is currently being investigated as part of another study commissioned by council. There has been a number of concerned comments relating to Lot 22 and these have been collated and provided to council to consider as part of this separate study.</p> <p>Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council.</p> <p>A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc.</p> <p>Given the extensive community support for drainage maintenance, this has been reflected in the multi criteria assessment under community support with the highest possible support. The revised rank of the option is now 20.</p>	WMA	Closed	
90	<p>Additional letter comments:</p> <ul style="list-style-type: none"> - flood level us of rail line to Feb bridge determined by amount of water flowing over rail line. - when Fed Bridge becomes a dam (2017) water diverted from main arm south through highschool and saltwater creek. - saltwater creek used to be tidal - creek now restricted by vegetation. - a 20m floodway should be constructed from adjacent the swimming pool through existing creek under rail line and direct to Kings creek. - breakwalls at bruns head have caused a gradual build up of sand in river. - feels nothing can be done because cost is out of reach and red tape will prevent. 	<p>Thanks for the letter and suggestions. The information you have included provides useful local insight into flooding in North Byron.</p> <p>We have included additional commentary on the need for drainage works within the floodplain. We have included the community support for Options SC and provided discussion around the importance of improving environmental flow in Saltwater Creek.</p> <p>The issue of sediment transport is beyond the scope of the FRMS. However, an action has been added to the draft FRMP for "Council to consider the development of a sediment transport model to investigate modification to the rock walls for the purpose of improved sediment transport – as part of the Coastal Management Program - Scoping Study for Cape Byron to South Golden Beach." This action has been included in Section 11.4.3 and is Option RW02.</p>	WMA	Closed	
91	<p>Additional comments:</p> <ul style="list-style-type: none"> - strong position shared by MRA - safety of residence should take priority over new development - investigation into no-fill zones is a necessity - submission endorsed by 170 residents in the MRA 	<p>Thanks for the letter from all residents involved in the Mullumbimby Residents Association. The letter and individual responses contained useful feedback and suggestions. We have made a number of additions and changes to try and address community concerns or further emphasise where there is community support.</p>	WMA	Closed	

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	<p>Additional letter comments:</p> <p>1. further investigation could lead to better flood mitigation at Billinudgel</p> <p>92 2. saltwater creek investigations should be pursued as there seems to be potential for further improvements there.</p> <p>3. further investigations is needed to establish the reason for flooding in Avocado Court.</p>	<p>Thanks for the letter and useful comments. We have made a number of additions and changes to try and address community concerns or further emphasise where there is community support.</p> <p>With respect to Billinudgel infrastructure improvements, we agree there is likely additional that can be done for flood mitigation in this area. We have added this paragraph in Section 12.1.2 to strengthen this position - <i>'The assessment below considers possible improvements to Billinudgel infrastructure, however does not identify a final configuration. The option is recommended for further assessment and as part of this assessment, further optioneering and testing should be conducted to optimise the flood mitigation potential for Billinudgel.'</i></p> <p>Similar to Billinudgel Infrastructure, we also agree there is likely optioneering that can be done to identify a preferred option for Saltwater Creek. We have added some additional commentary in Section 12.1.4 and mentioned some community suggestions from the public exhibition.</p> <p>Additional commentary has been added for Option AC in Section 12.1.3 noting there is a need for further study for this option with specific commentary that there is need to establish the primary cause of flooding.</p>	WMA	Closed	
93	No additional comments			Closed	
94	No additional comments			Closed	
95	No additional comments			Closed	
96	No additional comments			Closed	
97	No additional comments - second submission			Closed	
	<p>Additional letter comments:</p> <p>98 - cumulative fill modelling demonstrates increased flooding to township</p> <p>- requests south mullum precinct be designated a no-fill zone</p> <p>- lot 22 be abandoned</p> <p>- requests clear compassionate decision making</p>	<p>Thanks for the letter and useful comments. We have made a number of additions and changes to try and address community concerns or further emphasise where there is community support.</p> <p>Further work is being carried out with regards to the use of fill in future development. The findings will be incorporated into the final FRMS.</p> <p>The proposed affordable housing development at Lot 22 is currently being investigated as part of another study commissioned by council. There has been a number of concerned comments relating to Lot 22 and these have been collated and provided to council to consider as part of this separate study.</p>	WMA	Closed	
99	<p>Additional letter comments:</p> <p>- flooded in a flood event.</p> <p>- against filling of land.</p>	<p>Thanks for the letter and useful comments. We have made a number of additions and changes to try and address community concerns or further emphasise where there is community support. Further work is being carried out with regards to the use of fill in future development. The findings will be incorporated into the final FRMS.</p>	WMA	Closed	

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100	Additional letter comments: - we don't want any more water coming into our homes.		WMA	Closed	
101	No additional comments		WMA	Closed	
102	No additional comments		WMA	Closed	
103	Additional comments: - 2nd para low flat boggy land that will flood - 3rd water spreads back into developed sections of town - 4th put limitations on amounts of fill - evacuation process needs to be investigated / made more imperative - Drainage is a priority - back lanes e.g. prince St, end of argyle st and morrison avenue, lanes between Prince St and Morrison Ave	<p>Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council.</p> <p>A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc.</p> <p>Given the extensive community support for drainage maintenance, this has been reflected in the multi criteria assessment under community support with the highest possible support. The revised rank of the option is now 20.</p> <p>Section 9.3 discusses immunity of evacuation routes and centres in more detail and recommendations are made based on the findings. This information is prepared and provided to the SES to update the Local Flood Plan based on the information in this report.</p> <p>Further work is being carried out with regards to the use of fill in future development. The findings will be incorporated into the final FRMS.</p>	WMA	Closed	
104	No additional comments		WMA	Closed	
105	No additional comments		WMA	Closed	
106	No additional comments		WMA	Closed	
107	Additional letter comments: Recommends the dutch water management system.	Thanks for the letter and useful comments. We have made a number of additions and changes to try and address community concerns or further emphasise where there is community support.	WMA	Closed	
108	No additional comments		WMA	Closed	

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109	<p>Additional comments:</p> <ul style="list-style-type: none"> - considers Lot 22 affordable housing immoral. - Lot 22 should be retained for recreational purposes. - also concerned with water restrictions, sewerage and drainage 	<p>The proposed affordable housing development at Lot 22 is currently being investigated as part of another study commissioned by council. There has been a number of concerned comments relating to Lot 22 and these have been collated and provided to council to consider as part of this separate study.</p> <p>Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council.</p> <p>A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc.</p> <p>Given the extensive community support for drainage maintenance, this has been reflected in the multi criteria assessment under community support with the highest possible support. The revised rank of the option is now 20.</p>	WMA	Closed	
110	<p>Additional comments:</p> <ul style="list-style-type: none"> - doesn't feel council has consulted / listened to towns peoples proposals 	<p>Thanks for the letter and useful comments. We have made a number of additions and changes to try and address community concerns or further emphasise where there is community support.</p> <p>As part of the FRMS, a community survey was undertaken which was used to identify potential mitigation options and inform the acceptability of options. This consultation process has also been used to modify the FRMS reporting and is used in the multi-criteria assessment to assess recommended options.</p>	BSC	Closed	

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111	<p>Additional comments:</p> <p>- can council please address continual flooding in the southern end of the McGougans Lane. It is in the middle of the town.</p>	<p>Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council.</p> <p>A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc.</p> <p>Given the extensive community support for drainage maintenance, this has been reflected in the multi criteria assessment under community support with the highest possible support. The revised rank of the option is now 20.</p>	WMA	Closed	check
112	<p>Additional letter comments:</p> <p>Doc errors: study shows a dog leg in the river near Saltwater Creek and Mullum Creek - this area is now a small island as the river has cut a new path Mullumbimby showground designated industrial</p>	Check where the location is	WMA	Open	Email sent to Karl - await advice
113	No additional comments			Closed	

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114	<p>Letter from 2018</p> <p>Maintenance of storm drains, pipes under Tyagarah Street reach full capacity during heavy rain events and the height of the street holds back the water, hence a section of Stuart Street floods. Pipes are never cleaned out.</p> <p>Additionally the railway line prevents water leaving the town. Section north of woolworths acts essentially as a levy, inducing flooding in station street. The large open storm drain was full of rubbish contributing to poor drainage.</p> <p>Additionally a culvert under the track opposite Mill street was sandbagged, Who blocked this culvert and why.</p>	<p>Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council.</p> <p>A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc.</p> <p>Given the extensive community support for drainage maintenance, this has been reflected in the multi criteria assessment under community support with the highest possible support. The revised rank of the option is now 20.</p> <p>The report has been updated to include a section (Section 7.1.2) on blockages of hydraulic structures. As part of this, a sensitivity test was done to assess the potential impact from blocking the Mill Street culverts. Results of the assessment are shown in the figures in Appendix S.</p>	WMA	closed	
115	<p>Concern over inclusion of Mullum showground for dev in CD. The board has no strategic plans for development of showground.</p> <p>I want it to be 100% clear that no fill and no dense (urban style) development is envisaged for the yellow area of the Mullumbimby Showground.</p>	<p>WMA has responded via email directly and modified wording of FRMS</p>	WMA	Closed	

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116	<p>Letter 2</p> <ul style="list-style-type: none"> - debris stored on the low lying area "western area" of the showground early 2017 that washed away in March 2017 flood. Debris was unusual because i) huge chunks of mature fig tree and ii) concentrated in a pile after demolition of the tree. - told trees distributed by the flood along bank of Brunswick River. - concerned reports of strange flood behaviour in Mullums suburbs near river US fo Fed Bridge may have been caused by debris. - residents of Rush court spoke of rapid rise and fall of peak water in their street (far more rapid than river peak) - some residents believe there was a log jam at Fed Bridge - request blockages of stormwater outlets and at the bridge be investigated and reported in the plan - discuss possibility of these influences be discussed in the plan so that future flood investigations can assess it particularly after flood events - funding be set aside to ensure records are complete enough to assess factors 	<p>Thanks for the comments Debris is a real concern of the community. Option FDC that looks at managing blockages at large hydraulic structures would help to minimise the chance of a blockage at Federation Bridge occurring again. There are been considerable support for this option from the community and we have updated the multi criteria analysis to include this.</p> <p>We have also included additional commentary on the blockage assessment that we did in Section 7.1.2 which discusses a potential blockage at Federation Bridge.</p>	WMA	Closed	
117	<p>Letter 3</p> <ul style="list-style-type: none"> - believe plan should highlight to Council and state government the need to maintain and in some places upgrade infrastructure associated with urban waterways and piped drainage systems that feed Marshalls Creek. - Drainage systems are run down and assets deteriorate. - support catchment wide drainage and overland flow model - more assessment of properties which may benefit from property level protection - appropriate controls to manage impacts from future dev <p>request additional actions;</p> <ul style="list-style-type: none"> - where ocean shores country club believe it has sole control the Plan make it clear that the community need for flood protection is more important - future development not be allowed where it impacts existing residents 	<p>Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council.</p> <p>A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc.</p> <p>Given the extensive community support for drainage maintenance, this has been reflected in the multi criteria assessment under community support with the highest possible support. The revised rank of the option is now 20.</p> <p>Support for options CDM, Property Modification Options</p>	WMA	Closed	
118	<p>Post the development of North ocean shores since documents in 1989 and 1992, would like to know where this extra storm water is directed. A larger sewerage pump is required, located opposite my house, As flashing light occur post storms. A pump is required to clear water from the easement next to my house as the volume is increasing and the low outlet pipe to yelgan creek means we have flooding in to our yard. This water remains stagnant in the yard and easement, potentially containing contaminants.</p>	<p>Local drainage issues would be investigated as part of the catchment wide detailed drainage model that is recommended in Option CDM.</p>	WMA	Closed	

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119	<p>Drainage needs to be improved in various sections of Mullumbimby, by installing much larger piping in addition to improving Saltwater Creek by cleaning it out. Lot 22 should be should not be Implemented</p>	<p>The proposed affordable housing development at Lot 22 is currently being investigated as part of another study commissioned by council. There has been a number of concerned comments relating to Lot 22 and these have been collated and provided to council to consider as part of this separate study.</p> <p>Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council.</p>	WMA	Closed	
120	<p>I request for Balemo Drive Ocean Shores to be included in the study.</p> <p>The council stormwater drainage is completely in adequate. There is no kerb and channel. During torrential rain the street is constantly flooded. Not only are we flooded at the front of the property by the build up of storm water, we are also flooded with water at the back of the property due to the tidal creek.</p> <p>Southern Ocean Shores has always lacked infrastructure. We have half completed footpaths or no footpaths, no kerb and channels and drains are not cleared. We are in close proximity to North Byron Festival grounds and are therefore impacted by an huge influx of tourist, yet we do not receive the funding like the more scenic areas of the shire.</p>	<p>Thanks for the submission and useful information.</p> <p>We agree an investigation into the stormwater infrastructure is important for the North Byron area and the community. There have been a number of submissions raising these concerns. To address this, we have recommended a detailed catchment drainage model be developed including a formal pipe network. Due to the nature of flooding from stormwater infrastructure, it is important the model is built in a way that accurately reflects this type of flooding. Outputs of this study would likely include recommendations for improvements or maintenance strategies. We have incorporated the community support of this option in the multi criteria assessment.</p> <p>Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council.</p>	WMA	Closed	

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121	<p>Drainage needs to be addressed seriously. Lack of maintenance of storm water drains and pipes. Drain outside of 7 Stuart Street Mullumbimby remains a critical pinch point open drain transitions into a pipeline which subsequently discharges onto heritage Park.</p> <p>Evidence of blockage is clearly shown by the lack of discharge volume at the outlet onto Heritage Park.</p>	<p>Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council.</p> <p>A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc.</p> <p>Given the extensive community support for drainage maintenance, this has been reflected in the multi criteria assessment under community support with the highest possible support. The revised rank of the option is now 20.</p>	WMA	closed	
122	<p>1. The study does not include the northern end of Ocean Shores and Wooyung/Yelgun and stops at the Kallaroo Circuit Bund.</p> <p>2. That the Council flood study claims the Wooyung and Yelgun creeks systems that are not in the Flood study, have never had openings to the ocean through the dunes. That historical evidence from long time residents cannot be relied on. That a government map from 1887 showing Wooyung Creek forming an icoll at its mouth, and meandering through the dunes into the ocean, has been not considered in the Flood Plan.</p> <p>3. That the Council claims that the four creeks along the coastal strip from Wooyung to North Head cut off by the sandmining road in the 1950's make no difference to flooding issues. That the road does not prevent the natural drainage of flood waters to the ocean.</p> <p>4. That the Council staff claim their science proves opening the Kallaroo Circuit Bund to take flood waters to the ocean will not improve flooding. That Council never ordered it closed.</p> <p>5. That the report claims dredging of Marshall's Creek will not effectively improve flooding, nor will the removal of the inner rock wall at Readings Bay.</p> <p>I do not agree with the North Byron Floodplain Risk Management Strategy and Plan and request the computer modelling details for the Ocean Shores area be released for public scrutiny.</p>	<p>Thank you for providing your comments. The study area includes areas immediately north of Kallaroo Circuit bund, however the flood information is derived from a different model (the Coastal Creeks model). WMA will provide council the full data handover pack, which includes the model setup and results files.</p> <p>We have passed on your request to Council.</p>	BSC	Open	Pass on to BSC
123	<p>I do not agree with the North Byron Floodplain Risk Management Strategy and Plan and request the computer modelling details for the Ocean Shores area be released for public scrutiny.</p>	<p>The preliminary results of the mitigation options are now available in Appendix R. WMA will provide council the full data handover pack, which includes the model setup and results files.</p>	WMA	Closed	

124	<p>1. The rock walls at the entrance of Marshalls Creek:</p> <p>A number of references were made to this wall in the study. - Why was the option of modifying the rock walls not considered separately when it was acknowledged that the wall does restrict flood flows in a rain event which must then increase flood levels along the creek as the flood water cannot escape and the community stated that they were generally supportive. Our experience over the last 14 years is that all flooding has been caused by rainfall events in the Bilinudgel catchment and flooding has been exacerbated by a silted up and partially blocked Marshalls Creek.</p> <p>A study was done in 2017 mapping the levels of the floor of Marshalls Creek, which we understand showed the creek has had significant silting and a buildup of sand bars. The impact of this is not evident in the Study. The community has not seen the results of this mapping. The impact of continued silting of the creek has not been considered in the Study.</p> <p>Option CB01-Marshalls Creek dredging (MC), Ocean Outlets (OO), Rock Wall Modification (RW) and Kallaroo Circuit Bund Modification. The study acknowledges it groups these 4 options together and does not explore them individually. It then describes the potential flood mitigation for South Golden Beach, Ocean Shores and Brunswick Heads. No mention is made of the flood mitigation potential for New Brighton. No mention is made of the flood mitigation potential for New Brighton if just the wall was Modified (Marshalls Creek significantly impacts the flood levels in New Brighton).</p>	<p>Thanks for the submission and comments.</p> <p>Section 11.4.3 of the FRMS discusses modelling of the Marshalls Creek rock walls separately to the other mitigation options included in CB01. Initially figures were only prepared for options that progressed to detailed assessment. We have now included figures for preliminary mitigation options also and these are provided in Appendix R.</p> <p>Modifications to the rock walls were modelled for the 1% AEP flood event and the results for this event show the walls are already submerged in this event, meaning rock wall modifications won't impact flood levels for events of this size or larger. We look at the 1% AEP flood event as it is the magnitude of event that the floodplain management process broadly aims to manage. In saying this, the rock walls may have an impact on flood events smaller than a 1% AEP size event and as your comment indicates, may also have an impact on sedimentation.</p> <p>The modelling of these options showed no discernible benefit to any other areas in the catchment (including New Brighton) which is why no comment was made for these areas.</p> <p>We have now included a recommendation for council to '<i>Develop a sediment transport model to investigate modification to the rock walls, as part of the Coastal Management Program Scoping Study for Cape Byron to South Golden Beach.</i>'</p>	WMA	Closed	
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125	<p>2. The March 2017 "Calibration Event":</p> <p>Page 43 of 186 4.4 March 2017 Calibration Event notes "On the 31 March 2017, ex-Tropical Cyclone Debbie crossed into the Northern Rivers region in New South Wales subjecting the Brunswick River Catchment to heavy rainfall. As a result of this, Mullumbimby, Ocean Shores, Billinudgel, Brunswick Heads and Main Arm experienced severe flooding. This flood event saw homes inundated, residents forced to evacuate, roads closed and thousands of people without power".</p> <p>No mention is made of the flood impact on New Brighton where many houses were inundated.</p> <p>Yet on page 60 of 186 Table 9: Hazard Classification notes "...the majority of residential properties are located in the lower hazard areas for all events except the PMF. However, property numbers within high hazard areas do increase gradually as the size of the flood increases, particularly for New Brighton".</p> <p>If it is noted that New Brighton is particularly affected as flood height increases, why is New Brighton not noted in the March 2017 event? Nor in the modelling above for Option CB01?</p>	<p>Commentary has now been included on the impact experienced in New Brighton in the March 2017 flood event (included in Section 4.4, along with the flood mitigation benefits seen in New Brighton from combined option CB01 (included in Section 11.4.10 - Option CB01 Preliminary Results).</p>	WMA	Closed	
126	<p>3. River Street, New Brighton:</p> <p>Page 128 and 129 of 186 11.5.3. RM03: Improved Flood Access River Street, New Brighton discusses the option of raising River Street "...from the corner of Casons Road to past the corner of Oceans Avenue...".</p> <p>The diagram showing this option shows the potential for an increase in flooding to Pacific Street as the river would break its bank past the raised section of River Street and flood down River Street into Pacific Street.</p> <p>Houses at the start of Pacific Street flood from the road not the river.</p> <p>If this option was to be considered River Street should be raised past Pacific Street.</p>	<p>Option RM03 of Section 11.5.3. that considers raising River Street identifies these widespread impacts. This assessment is a preliminary assessment only and the purpose is to understand potential benefits and constraints to identify options that could be considered further as part of a more detailed investigation. Raising River Street alone with no mitigation works will cause unacceptable impacts and that is not the intention.</p> <p>This option recommends that a feasibility assessment is required to investigate design options that mitigate any adverse impacts, this will likely include looking at improved drainage as an option. Additional commentary has been added detailing that this option would only be an option if appropriate mitigation measures were investigated. We have also included a comment that this further assessment should consider testing additional options including raising River Street past Pacific Street.</p>	WMA	Closed	
127	<p>Study did not consider measures for South Golden Beach. Recommendations were to audit the levee and make residents aware of evacuation plans. Not enough.</p>	<p>South Golden Beach already benefits from a levee and therefore it was identified that maintaining the integrity of the levee system was the priority. The FRMS focused on other areas of the floodplain that had a higher flood risk. However, drainage maintenance and improvements have been noted as a concern of the SGB community. Option CDM recommends for a catchment wide detailed drainage investigation to further consider flood risk from local drainage networks and potential improvements.</p>	WMA	Closed	

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128	Seventh Day adventist church does not have a generator to supply power. Source funds to purchase a generator.	For the recommendation RM01 in Section 11.5.1. we have changed the wording to: 'Consider adopting the Seventh Day Adventist Church as the primary evacuation centre in South Golden Beach and investigate funding opportunities to obtain a generator for the church,'	WMA	Closed	
129	February 2020 flooding - flooding western side of canal caused by 1) fill in the far end of Elizabeth Avenue in an easement that used to flow into Capricornia Canal 2) drains and easements that are overgrown pits on western and eastern side of canal have made no difference to flooding. too expensive - not justifiable.	Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council. A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc. Given the extensive community support for drainage maintenance, this has been reflected in the multi criteria assessment under community support with the highest possible support. The revised rank of the option is now 20.	WMA	Closed	
130	drainage issues - pump not working due to easement being blocked	Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council. A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc. Given the extensive community support for drainage maintenance, this has been reflected in the multi criteria assessment under community support with the highest possible support. The revised rank of the option is now 20.	WMA	Closed	

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131	flooding in Beach Avenue and Jack Lane. We believe solution could be two small pumps to get water across Beach Avenue.	<p>Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council.</p> <p>A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc.</p> <p>Given the extensive community support for drainage maintenance, this has been reflected in the multi criteria assessment under community support with the highest possible support. The revised rank of the option is now 20.</p>	WMA	Closed	
132	Redgate Road is also an area of concern - water builds up in front of 7 Redgate Road.	<p>Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council.</p> <p>A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc.</p> <p>Given the extensive community support for drainage maintenance, this has been reflected in the multi criteria assessment under community support with the highest possible support. The revised rank of the option is now 20.</p>	WMA	Closed	

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133	We believe there should be a Northern Drainage Crew whose job is to keep all drainage easements clean	<p>Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council.</p> <p>A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc.</p> <p>Given the extensive community support for drainage maintenance, this has been reflected in the multi criteria assessment under community support with the highest possible support. The revised rank of the option is now 20.</p>	WMA	Closed	
134	Requests moer consideration than periodic levee audtis.	<p>Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council.</p> <p>A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc.</p> <p>Given the extensive community support for drainage maintenance, this has been reflected in the multi criteria assessment under community support with the highest possible support. The revised rank of the option is now 20.</p>	WMA	Closed	

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135	<p>Objects to raising River Street. Believes it is the residents risk of buying in New Brighton. Concerned raising of road will cause widespread impacts elsewhere. Concerned about other streets that don't have evacuation routes. Believes solution is proper drainage on Strand Avenue.</p>	<p>Option RM03 that considers raising River Street identifies these widespread impacts. This assessment is a preliminary assessment only and the purpose is to understand potential benefits and constraints to identify options that could be considered further as part of a more detailed investigation. This option recommends that a feasibility assessment is required to investigate design options that mitigate any adverse impacts, this will likely include looking at improved drainage as an option. Additional commentary (under section 11.5.3 SUMMARY) has been added detailing that this option would only be an option if appropriate mitigation measures were investigated.</p> <p>Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council. A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc.</p> <p>Given the extensive community support for drainage maintenance, this has been reflected in the multi criteria assessment under community support with the highest possible support. The revised rank of the option is now 20.</p>	WMA	Closed	
136	<ul style="list-style-type: none"> - objection the study stops at capricornia canal, it leaves out two significant northern creek systems - concerned exclusion of these systems has affected true understanding of flood situation in the coastal north of the shire - concerned floodwaters from two creek systems north cannot escape to ocean as has happened for millenia - object to plan's claim that the question of council's liability for caused flooding cannot be taken seriously 	<p>The study extent is a predefined study area. Inflows from the north catchment are included in the hydrologic model and are included as inputs into the hydraulic modelling.</p> <p>The ocean outlets have been modelled as a mitigation option. Results of this assessment are now included in Appendix R.</p> <p>We aren't sure where in the report you are referring to about councils liability? Are you able to clarify. The report does not provide any commentary regarding Council's liability.</p>	WMA	Closed	

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137	<ul style="list-style-type: none"> -reject findings of the Draft North Byron FRMS - false information accepted as fact - early consultants Webb McEwan refused to model outlet with a connecting channel - does not accept item 5 on page 10 of this report - quoted 'matters relating to past council decisions and issues of responsibility are an extremely complex area that require considerable staff resources to investigate substantially. For example, most of the relevant documents are stored in an old document management system which few staff can use and most documents are on microfiche' - 1.1 of draft is wrong. Mullum not largest town. - item 5.1 of the flood study is incorrect - top three structural options were dredging, re-establishment of ocean outlets, removal of internal rock wall - council and consultants used photos from OSCA website without acknowledgement in their survey - option CB01 of study is incorrect as previous studies in 1991 show that significant reductions would have occurred in 1987 - disappointed Yelgun and Wooyung not included in plan - option GCW was modelled in the wrong location - details provided to WMA and council - existing flood environment in draft plan is incorrect - not exacerbated by elevated ocean conditions - oppose levees without any compensatory flood reduction measures - study do not include 1974 and 1976 floods 	<p>Regarding item 5 on page 10 of this report - are you able to confirm you are referring to the FRMS report, as we cannot find this point.</p> <p>We aren't sure where in the report you are referring to about councils liability? Are you able to clarify. The report does not provide any commentary regarding Council's liability.</p> <p>We have now corrected the section where we referred to Mullumbimby as the largest town.</p> <p>We have clarified that the top three structural measures were based on responses to Question 13 of the community survey.</p> <p>We included all the golf course weirs in the model for the design events, however the mitigation option only considered lowering of the Terara Court weir. This option showed minimal difference as for a 1% AEP flood event the weir is drowned out. We expect this will be the same for other weirs.</p> <p>The study extent is a predefined study area. Inflows from the north catchment are included in the hydrologic model and are included as inputs into the hydraulic modelling.</p>	WMA	Open	Request clarification
138	<ul style="list-style-type: none"> - Opposes lot 22 development - any development south of brunswick road outside of existing town boundary will add to flood problem - Kings Creek viaduct would need to be expanded by another 2 openings - further development in Industrial area will exacerbate construction - lives in Avocado court - believes flood was caused by a tree blocking creek - deepening or widening of Saltwater creek without removal of railway ballast will cause more unwanted water directed to their property 	<p>Thanks for the submission and useful comments. We have made some changes to try and address these comments including the following:</p> <p>The proposed affordable housing development at Lot 22 is currently being investigated as part of another study commissioned by council. There has been a number of concerned comments relating to Lot 22 and these have been collated and provided to council to consider as part of this separate study.</p> <p>Additional commentary has been added for Option AC in Section 12.1.3 noting there is a need for further study for this option with specific commentary that there is need to establish the primary cause of flooding. We have also noted there are varying degrees of support and opposition to this option.</p>	WMA	Closed	check

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139	<p>saltwater creek often blocked - needs to be cleared to provide environmental flow.</p> <p>- prevent dumping of trees and branches by people who poison / chop down trees</p> <p>- dead trees will block saltwater creek and add to the flooding of mullum</p> <p>- DAs that are approved for tree removal should include instructions for disposal of timber at main council not in the rivers</p>	<p>Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council.</p> <p>A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc.</p> <p>Given the extensive community support for drainage maintenance, this has been reflected in the multi criteria assessment under community support with the highest possible support. The revised rank of the option is now 20.</p> <p>The report has been updated to include a section (Section 7.1.2) on blockages of hydraulic structures. Results of the assessment are shown in the figures in Appendix 5.</p> <p>Your suggestion as been noted and provided to council.</p>	BSC	Closed	
140	<p>Option OO - I would like to see details of modelling for this option. How large were the openings? What level were openings modelled at? North Creek Road is the blocking structure. Road needs to be lowered with a 20m long dip down to 2m high tide level in the creek? Were different rates of water accumulation over time considered?</p> <p>In response to 'Ocean outlets likely to cause negative impact for a flood event with high ocean levels' - in case of storm surge flow of water out would prevent flow in. Sea level rise from CC will result in increased water levels in creeks and make nearby areas unliveable. lowerable tide gates could be employed to keep residents at ease.</p>	<p>Each of the outlets were modelled with a 20m (as well as a sensitivity scenario of 50m) wide opening set to the existing level each side of the dune. This is approximately at 1.5 m AHD on each side of the dune. The option was modelled for an ensemble of 1% AEP flood events that include a combination of different ocean water levels and catchment rainfall.</p> <p>Where the ocean water level is dominating the event in the lower parts of the catchment (storm surge, high tide etc.) there is potential ocean outlets would allow ocean water in and increase inundation in these lower parts of the floodplain.</p>	WMA	Closed	
141	Ocean Outlets - improve quality of water and ecosystems by returning them to being tidal creeks as they were prior to sandmining.		BSC	closed	
142	South Golden Beach - residents phoned requesting pumps to be turned on. Council need an automatic procedure to have pumps turned on when the water reaches a certain height.	Thanks for the submission - Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network, which includes pumps. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council.	BSC	closed	email sent to BSC - await advice

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143	Wooyung and Yelgun systems - does the study include the Wooyung and Yelgun creek systems and properties to the north of Kallaroo Circuit Bund that could be affected by these systems	Inflows from the north catchment are included in the hydrologic model and are included as inputs into the hydraulic modelling. The hydraulic study area is a predefined model extent. Mapping is provided in the areas north of Kallaroo Circuit Bund based on the Coastal Creeks Flood Study Results.	WMA	closed	
144	Support for: Drainage maintenance - regularly removing unwanted vegetation and other debris from the network. Support for Option FDC - further consideration of debris control measures Support Option BL - a levee for Billinudgel should be considered in detailed assessment Option BM - infrastructure improvements in Billinudgel supported Support combined option CB02 Do not support no fill zone in Marshalls Creek. The area outside of the study area specifically.	Thanks for your submission and useful comments. We have factored in your support for actions relating to improved drainage maintenance, Option FDC, Option BL, Option BM and combined option CB02 within the multi criteria assessment under community support. With respect to the no fill zone in Marshalls Creek shown in the attached figure of your response, we would like to assure you that this area outside of the study area is not being recommended as a no-fill zone in this plan. The figure you refer to was a no fill area that was investigated in a previous study and was only included in the cumulative development assessment to understand how current policy and practices may impact the floodplain. Our recommendation is that a more nuanced approach is taken to identify areas where there should be no-fill (typically the floodway), areas where balance cut and fill is recommended and areas that have no impact on the flood behaviour and no constraints are needed.	WMA	closed	
145	- drainage system in south golden beach needs improvement including unblocking of easements - regular maintenance of drainage does not happen. - pump in SGB is often not used - if the pump was turned on at the right time it may reduce impacts	Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council. A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc. Given the extensive community support for drainage maintenance, this has been reflected in the multi criteria assessment under community support with the highest possible support. The revised rank of the option is now 20.	WMA	Closed	

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146	Does not support Lot 22 development. Drainage maintenance is required. Drain outside 121 Stuart Street Mullumbimby is almost completely blocked by a palm tree.	<p>The proposed affordable housing development at Lot 22 is currently being investigated as part of another study commissioned by council. There has been a number of concerned comments relating to Lot 22 and these have been collated and provided to council to consider as part of this separate study.</p> <p>Extensive community feedback has been received raising concern around the maintenance and effectiveness of the stormwater network. Section 5.2.1 has been added within the report documenting this widespread concern. Where specific areas have been noted as requiring maintenance or upgrades, these have been collated and provided to council.</p> <p>A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc.</p> <p>Given the extensive community support for drainage maintenance, this has been reflected in the multi criteria assessment under community support with the highest possible support. The revised rank of the option is now 20.</p>	WMA	Closed	
147	current flooding in New Brighton does not come from marshalls creek but rather water that has already left the creek at a point to the west of the village and then flowed north. historically this water would have flowed to the ocean or fill detention basins in south golden beach. SGB levee and closure of ocean outlets prevents this.	The model has been built using the best available data at the time for the purposes of understanding catchment-wide riverine flood risk. Some of the local features may not be included in this model, however recommendation CDM would refine these local features.	WMA	Closed	
148	<p>Request study includes the following:</p> <ul style="list-style-type: none"> - importance of the drainage network that carried flood waters from Marshalls Creek to the north and impact of the floodplain changes on this option are properly acknowledged. Failure to do so is professionally negligent. - The modelling includes a capacity study where the impact of flood pumps installed to the north of the sports fields in New Brighton to pump flood waters accumulating to the north of the village over the dunes into the ocean is modelled. While this option may present some engineering and environmental issues practically, these would be minimal compared to those identified for reinstating an ocean outfall. Data to define the relationship between size of pump and potential impact on flooding is needed to determine the return on investment of such infrastructure in the future. 	<p>A recommendation has been made within the FRMS in Section 11.4.5 for the development of a drainage model and overland flow path investigation. As part of this model, the current network capacity would be investigated along with potential drainage mitigation options. This may include installation of kerbs and gutters, modifications to swale drains, a maintenance program looking at clearing drains, creeks and gutters, pipe upgrades etc.</p> <p>As alluded to the logistical (feasible) issues of a pump of this nature would be prohibitive to implementation.</p>	WMA	Closed	

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149	<p>Other issues noted:</p> <p>1.The impact of restriction of flows in the lower sections of the river near the rock walls is covered, but there is no mention of silting of the creek reducing the carrying capacity of the creek channel. The severe silting in the creek from the norther end of Pacific Street is a major contributing factor why the creek cannot handle the volume of the combined flood waters at this point.</p> <p>2.The lack of understanding of the organisations responsible that New Brighton exists as a separate entity from Ocean Shores, or suffered any damage during the last flood event, made claiming for flood damage grants difficult for residents as the village was not listed as being impacted. This omission does continue in some parts of the report.</p> <p>3.The impact of any alterations to River Street to improve access during flood needs to be modelled, as the height of River Street determines the level of water to the north before it flows back into Marshalls Creek. Raising the level of the river may have serious impacts on the residents in that section of the village.</p>	<p>Section 11.4.3 under Option RW - Rock Wall Modifications now discusses the potential for increased sedimentation in Reading's Bay from the rock walls. To address this, a new recommendation has been added (RW02) that recommends council consider development of a sediment transport model to investigate modifications to the rock walls.</p> <p>In response to (2) thanks we will pass this feedback back to council.</p> <p>Option RM03 that considers raising River Street identifies these widespread impacts. This assessment is a preliminary assessment only and the purpose is to understand potential benefits and constraints to identify options that could be considered further as part of a more detailed investigation. This option recommends that a feasibility assessment is required to investigate design options that mitigate any adverse impacts, this will likely include looking at improved drainage as an option. Additional commentary (under section 11.5.3 SUMMARY) has been added detailing that this option would only be an option if appropriate mitigation measures were investigated.</p>	WMA	Closed	
150	Orchid Place is listed however mapping shows the 1% level indicating it hasn't been included.	We have reviewed the identified additional developments and will be updating the model to incorporate these based on further information newly provided by Council. A short memorandum and revised peak depth and level grids will be produced.	WMA	Closed	
151	<p>Tallowood subdivision is also listed but flood mapping and cadastre are inconsistent with work as executed.</p> <p>Other developments that do not appear to have consistent topography with the hydraulic model are as follows:</p> <ul style="list-style-type: none"> •115 Station Street Mullumbimby (filling and box culverts, 2018/2019) •Manns Road (opposite Smith Street) Mullumbimby (filling, 2014) •Towers Drive (south side) Mullumbimby (filling, 2015) •56 – 80 Redgate Road, South Golden Beach (filling, 2016) •3A – 3C Byron Street, New Brighton (filling, 2014) 	We have reviewed the identified additional developments and will be updating the model to incorporate these based on further information newly provided by Council. A short memorandum and revised peak depth and level grids will be produced.	WMA	Closed	
152	discussion on Mullumbimby Road - a known access road to Mullum and is closed due to flooding even in minor events - Discussion requested.	The road is outside the study area and subject to short duration flash flooding, Council have identified two options should be investigated. : Road and/or culvert capacity changes to resolve the issue Automatic flood warning signage. This will be included in the FRMS	BSC	Open	include in FRMS
153	notes recommendation for fpa to incorporate climate change is inconsistent with councils LEPs	The proposed FPA is not consistent with current definitions, however, given the sensitivity of the catchment to climate change, the FRMS suggests it is updated to use the events recommended in the FRMS.	WMA	closed	

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154	<p>Given that Council has 2 LEPs and 2 DCPs, comments should also be provided in regard to Part K of DCP 2010</p> <ul style="list-style-type: none"> •Consideration of control measure FL1 of the flood planning matrix in the DCP, which requires non habitable rooms/buildings to be equal to or above 10 yr flood level plus 0.3m. This creates an inequitable flood planning level because 0.3m above the 10 year flood level provides a different level of protection dependant on the flood characteristics of the area. It is suggested that FL1 be changed to "All floor levels to be greater than or equal to the 20 year flood level" to provide consistency across the floodplain and with clause 3C.6(2)(g) of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008, which states "the lot must not have any open car parking spaces or carports lower than the level of a 1:20 ARI (average recurrent interval) flood event". •Consideration of control measure FL4 of the flood planning matrix in the DCP, which includes provisions relating to "weatherproof area". There is no definition in the DCP, LEP or dictionary for "weatherproof area" and as such a definition should be included to explain the intent of this control measure. It is suggested that the DCP be amended to include a definition such as "weatherproof area means the gross floor area of habitable rooms with floor levels below the 2050 flood planning level". •Consideration of whether the headings of the flood planning matrix in the DCP could be better worded to align with clause 6.3 (6) of BLEP 2014 and whether the controls are consistent with the provisions of clause 6.3 (3) and (4) of BLEP 2014. That is, should the headings "Primary Constraints" and "Additional Constraints" be "Flood Planning Level Constraints" and "Future Flood Planning Level Constraints" respectively and do the controls under each of these headings suitably provide for the provisions of clause 6.3(3) and 6.3(4) respectively. •Consideration of whether the flood planning matrix in the DCP should include 	These have been included essentially verbatim within the FRMS	WMA	Closed	
155	PM07 needs to be more specific for inclusion in DCP	We are unable to be more specific in recommendations for flood proofing as this can and should be property specific. We are only able to discuss the high level principles of flood proofing, and recommend that the guidance discussed is referred to in support of implementing this action	WMA	closed	
156	PM08 - should also provide comments on whether it is appropriate to include property level protection in regards to FL4 in flood planning amtrix	Now included in recommendation	WMA	Closed	

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157	<p>11.6.9.PM09: Section 10.7 Certificate This section recommends the high resolution outputs from this study and other studies in Council be used to provide a greater level of detail via Section 10.7(5) certificates. Much of this information is already available from Council's Flood Information Certificates available for purchase – see Council's website for details. https://www.byron.nsw.gov.au/Services/Building-development/Plans-maps-and-guidelines/Flood-planning. Commentary should be included in this section in regard to Council's flood information certificates.</p> <p>This section also recommends providing property level flood information via an online GIS platform. Until this is available, as figures for flood function, hydraulic hazard, flood hazard, flood planning levels and flood planning areas are important tools for assessment of development, including exempt and complying development, these figures in the FRMS must include cadastre boundaries and the locality labels should be removed or moved to ensure the relevant figures are legible.</p>	Await advice from BSC	WMA	Closed	email sent to BSC - await advice
158	<p>11.6.10.PM10: Further investigation into future development controls This section recommends further assessment of controls to manage cumulative development impacts. These further assessments should be carried out now and recommendations for controls such as "no fill zones" developed as part of the North Byron Catchment Flood Risk Management Study and Plan. This is an expected outcome of the FRMS&P and is consistent with Council's other studies (Tallow Creek, Belongil Creek, Marshalls Creek). If this cannot be carried out as part of the Byron Catchment Flood Risk Management Study and Plan, then recommendations must be given for precautionary development controls, including "No Fill Zones".</p>	Variation requested for this work to be completed.	WMA	Closed	

BYRON SHIRE COUNCIL



NORTH BYRON FLOODPLAIN RISK MANAGEMENT PLAN

DRAFT



MARCH 2020



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NORTH BYRON FLOODPLAIN RISK MANAGEMENT PLAN

DRAFT

MARCH 20

Project North Byron Floodplain Risk Management Plan		Project Number 117098	
Client Byron Shire Council		Client's Representative James Flockton	
Authors Katrina Smith Ella Harrison		Prepared by TO BE SIGNED FOR FINAL REPORT	
Date 16 March 2020		Verified by TO BE SIGNED FOR FINAL REPORT	
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NORTH BYRON FLOODPLAIN RISK MANAGEMENT PLAN

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FOREWORD

The NSW State Government's Flood Prone Land Policy provides a framework to ensure the sustainable use of floodplain environments. The Policy is specifically structured to provide solutions to existing flooding problems in rural and urban areas. In addition, the Policy provides a means of ensuring that any new development is compatible with the flood hazard and does not create additional flooding problems in other areas.

Under the Policy, the management of flood liable land remains the responsibility of local government. The State Government subsidises flood mitigation works to alleviate existing problems and provides specialist technical advice to assist Councils in the discharge of their floodplain management responsibilities.

The Policy provides for technical and financial support by the Government through four sequential stages:

1. **Flood Study**
 - Determine the nature and extent of the flood problem.
2. **Floodplain Risk Management**
 - Evaluates management options for the floodplain in respect of both existing and proposed development.
3. **Floodplain Risk Management Plan**
 - Involves formal adoption by Council of a plan of management for the floodplain.
4. **Implementation of the Plan**
 - Construction of flood mitigation works to protect existing development, use of Local Environmental Plans to ensure new development is compatible with the flood hazard.

The study and development of the North Byron Floodplain Risk Management Study and draft Management Plan were jointly funded by Department of Planning, Industry and Environment (formerly known as Office of Environment and Heritage) and Byron Shire Council.



1. INTRODUCTION

Byron Shire Council engaged WMA Water to deliver the North Byron Floodplain Risk Management Study (FRMS) (Reference 1) and develop a draft Floodplain Risk Management Plan (FRMP).

The North Byron Floodplain Risk Management Plan (this document) is the third phase of the floodplain management process. It has been developed based on the findings of the FRMS which included a comprehensive assessment of the existing flood risk in the catchment. This included consideration of the flood hazard across the catchment; impacts on existing residential, commercial and industrial properties; road flooding; and, emergency response during a flood event. The FRMS also considered how this risk may change under future scenarios resulting from increased development or a changing climate.

The purpose of this draft FRMP is to provide a long-term path to manage flood risk in the North Byron floodplain both now and into the future. Management options recommended in this draft FRMP have been identified through a detailed evaluation of factors that affect and are affected by the use of flood prone land as discussed in Section 2.

1.1. Study Area

The study area of this draft FRMP comprises the towns of Mullumbimby, Ocean Shores and Brunswick Heads, and the villages of South Golden Beach, Billinudgel and New Brighton.

The FRMS (Reference 1) provides a detailed description of the catchment characteristics including flood behaviour, social characteristics and environmental features. A high level summary is provided in the following sections.

The catchment is predominantly green space made up of nature reserve and rural land for primary production and agricultural purposes. There are six townships within the study area, which comprise mainly low density residential development, light and general industrial and some commercial.

Flooding within the North Byron study area can result from either elevated ocean conditions, catchment flooding, or a combination of both. Historically, flooding has occurred as a result of Ex-Tropical Cyclones or East Coast Lows generating flooding from both mechanisms. Whilst catchment flood events represent the dominant form of flooding in the catchment, low lying areas such as Brunswick Heads are more vulnerable to ocean derived flooding.

1.2. Economic Impact of Flooding

A flood damages assessment was carried out within the FRMS (Reference 1) for the inundation of residential and commercial properties. The assessment was based on surveyed and estimated flood levels for all properties in the study area. The annual average damages for residential and commercial/industrial properties was found to be \$2,667,100.



The catchment, and the resulting economic impacts from flooding, was shown to be sensitive to changes in both future development and climate conditions under the various scenarios assessed in the FRMS.

1.3. Floodplain Risk Management Options

The FRMS includes an investigation of possible options for the management of flood risk in the study area. These included flood modification works such as the construction of levees and significant drainage upgrades, as well as property modification measures and response modification options.

The measures were assessed for their ability to reduce flood risk while also considering their economic, social and environmental impacts. A multi-criteria assessment was used to compare the options, which included the following criteria:

- Economic merits
- Technical feasibility
- Long term performance
- Impact on emergency services,
- Impacts on critical and/or vulnerable facilities,
- Impact on properties,
- Impact on flood hazard / risk to life,
- Community flood awareness,
- Climate change adaptability,
- Community and stakeholder support / impacts,
- Environmental and ecological impacts,
- Legislative compliance, including requirement for approvals
- Financial feasibility
- Compatibility with existing Council plans, policy and strategic direction.

The type of management options and their assigned priority represent the considered opinion of the consultants, Council, the Floodplain Management Committee and the local community, on how to best management its flood risk and its flood prone land.

The results from this assessment are discussed in Section 2.



2. RECOMMENDED FLOODPLAIN RISK MANAGEMENT MEASURES

Each option recommended by the FRMS was assessed using the multi-criteria assessment and the resulting scores and overall rank provided in Table 1.

Table 1: Assessment of Floodplain Risk Management Options

ID	FRMS Report Section	Option	Total Score	Overall Rank
PM04	11.6.4	Flood Planning Levels revised based on the recommendations of the FRMS.	20	1
PM09	11.6.9	Section 10.7 (5) certificates to provide further detail of flood behaviour and related. Consideration to providing property-level flood information via an online GIS platform.	18	2
RM02	11.5.2	Byron Shire Council and SES to consider the findings and recommendations of FRMS in the development of the Flood Warning Network for North Byron. (RM02);	18	2
RM05	11.5.5	Identify key roads and implement automatic warning signs and depth indicators.	16	4
PM07	11.6.7	Provide more detailed guidance on the principles of wet proofing, appropriate design and materials, with direct reference to available guidelines.	16	4
PM08	11.6.8	Undertake more detailed assessment of properties which may benefit from property level protection and include a requirement for an assessment of property level protection as part of the DCP2014 planning matrix criteria FL4.	15	6
PM01	11.6.1	Further investigate raising eligible residential properties to reduce flood damages.	15	6
PM06	11.6.6	Council consider updating the DCP to incorporate the recommendations detailed in the FRMS	15	6
SC	12.1.4	Further detailed assessment of Saltwater Creek upgrade assessment and mitigation options for Mullumbimby.	15	6
PM10	11.6.10	Implement the recommendations regarding appropriate fill areas in the DCP2014	15	6
RM06	11.5.6	Engage with the community to prepare an ongoing flood education program, with appropriate evaluation by Council and SES following implementation	14	11
RM01	11.5.1	Council and the SES to update the Local Flood Plan based on findings of the FRMS.	14	11
AC	12.1.3	Further consideration of Avocado Court drainage modification	14	11
RM07	11.5.7	Undertake an Evacuation Assessment for Mullumbimby	14	11
BMU	12.1.2	Further consideration of Billinudgel infrastructure improvements	13	15
WFG	11.4.4	Develop guidance on the design and installation of fencing traversing waterways and channels	13	15
PM02	11.6.2	Consider establishing a Voluntary House Purchase scheme for eligible properties.	13	15
FDC	11.4.6	Implement debris control measures for Federation Bridge and Billinudgel Railway Bridge	12	18
PM05	11.6.5	Revise the Flood Planning Area based on the recommendations of the FRMS	12	18

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North Byron Floodplain Risk Management Plan

RM03	11.5.4	More detailed assessment of potential raising of River Street to provide improved flood immunity and evacuation	11	20
CDM	11.4.6	Development of whole of catchment drainage model and overland flow path investigation	11	20
RW02	11.4.3	Develop a sediment transport model to investigate modification to the rock walls, as part of the Coastal Management Program Scoping Study for Cape Byron to South Golden Beach.	11	20
PM03	11.6.3	Changes to land use zoning should consider flood compatibility based on the recommendations of the FRMS	8	23
SGBA	11.4.1	Implement the recommendations of the South Golden Beach levee audit	7	24
NCD	11.4.5	Further consider viable options to implement the recommendations of the New City Road drainage assessment	4	25

Following this, options have been prioritised based on the ability to reduce flood risk in North Byron, and how readily it can be implemented (and funded, if necessary). The recommended measures are as follows (in no particular order within each priority group).

2.1. High Priority Actions

- Flood Planning Levels revised based on the recommendations of the FRMS. (PM04);
- Section 10.7 (5) certificates to provide further detail of flood behaviour. Consideration to providing property-level flood information via an online GIS platform. (PM09);
- Byron Shire Council and SES to consider the findings and recommendations of FRMS in the development of the Flood Warning Network for North Byron. (RM02);
- Identify key roads and implement automatic warning signs and depth indicators. (RM05);
- Provide more detailed guidance on the principles of wet proofing, appropriate design and materials, with direct reference to available guidelines. (PM07);
- Undertake more detailed assessment of properties which may benefit from property level protection and include a requirement for an assessment of property level protection as part of the DCP2014 planning matrix criteria FL4. (PM08);
- Further investigate raising eligible residential properties to reduce flood damages (PM01);
- Council consider updating DCP to incorporate the recommendations detailed in the FRMS (PM06);
- Further detailed assessment of Saltwater Creek upgrade assessment and mitigation options for Mullumbimby (SC);
- Implement the recommendations regarding appropriate fill areas in the DCP2014 (PM10).

2.2. Moderate Priority Actions

- Engage with the community to prepare an ongoing flood education program, with appropriate evaluation by Council and SES following implementation. (RM06);
- Council and the SES to update the Local Flood Plan based on findings of the FRMS. (RM01);



- Further consideration of Avocado Court drainage modification. (AC);
- Undertake an Evacuation Assessment for Mullumbimby. (RM07);
- Further consideration of Billinudgel infrastructure improvements (BMU);
- Develop guidance on the design and installation of fencing traversing waterways and channels (WFG);
- Consider establishing a Voluntary House Purchase scheme for eligible properties (PM02);

2.3. Low Priority Actions

- Implement debris control measures for Federation Bridge and Billinudgel Railway Bridge (FDC);
- Revise the Flood Planning Area based on the recommendations of the FRMS (PM05);
- More detailed assessment of potential raising of River Street to provide improved flood immunity and evacuation (RM03);
- Development of whole of catchment drainage model and overland flow path investigation (CDM);
- Develop a sediment transport model to investigate modification to the rock walls, as part of the Coastal Management Program Scoping Study for Cape Byron to South Golden Beach (RW02);
- Changes to land use zoning should consider flood compatibility based on the recommendations of the FRMS (PM03);
- Implement the recommendations of the South Golden Beach levee audit (SGBA);
- Further consider viable options to implement the recommendations of the New City Road drainage assessment (NCD).

**3. DRAFT FLOODPLAIN RISK MANAGEMENT PLAN**

Table 2 provides further details of all mitigation measures which have been recommended for implementation. The tables describe the purpose of the measure, as well as its priority, cost, timeframe and the party responsible for its implementation.

Further information regarding each option is provided in Section 11 and Section 12 of the FRMS, which also contains measures that were assessed but were not viable for recommendation.

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Table 2. North Byron Floodplain Risk Management Study and Plan (Part 1 of 3)

	Option ID (FRMS Report Section)	Option	Description	Benefits	Concerns	Responsibility	Funding	Cost	B/C Ratio	Priority
Response Modification Options	RM01 (11.5.1)	Council and the SES to update the Local Flood Plan based on findings of the FRMS.	This FRMS provides useful information to inform emergency planning including an assessment of flood behaviour, isolation, access and movement, vulnerable and critical infrastructure and information to support evacuation planning.	Improved flood planning reduces flood risk to life and property, assisting residents of flood prone areas better prepare themselves and their property for flooding.	There are a number of documents to be updated and coordinated.	SES and Council	May be eligible for NSW Government funding.	Moderate initial and ongoing costs.	High	Moderate
	RM02 (11.5.2)	Byron Shire Council and SES to consider the findings and recommendations of FRMS in the development of the Flood Warning Network for North Byron.	This FRMS produced a range of information useful to emergency services and the development of the Flood Warning Network, including but not limited to, the identification of hotspots, areas with evacuation constraints and findings from the community survey.	Improved warning systems will increase the accuracy and timeliness of flood predictions and improve the communication methods to deliver accurate and persuasive messages during flooding.	Cost and ongoing efforts to ensure the effective development of the North Byron Flood Warning Network. Challenges include change of personnel, difficulty in organising meetings and exercises between flood events.	All response agencies, including but not limited to the NSW SES, Council, NSW RFS, Fire and Rescue, and community organisations.	North Byron Flood Warning Network project is already underway.	Low to moderate capital and ongoing costs, partial funding available	High	High
	RM03 (11.5.3)	More detailed assessment of potential raising of River Street to provide improved flood immunity and evacuation.	An assessment into raising River Street to provide 1% AEP flood immunity including design options that mitigate adverse impacts.	While it is not feasible to raise the road to be completely free of flood, improving immunity along these sections of road will would improve access for the local community and would allow for evacuation to flood free land.	Raising of River Street would need to be done in conjunction with mitigation works to avoid adverse impacts to properties in Ocean Shores and New Brighton. Capital costs likely to be significant.	Council would be responsible for construction and maintenance.	May be eligible for NSW Government funding.	Low to moderate capital and ongoing costs.	N/A	Low
	RM05 (11.5.5)	Identify key roads and implement automatic warning signs and depth indicators.	Consider investigating automatic warning signs and depth indicators for the Pocket Road and Sherry's Bridge on Main Arm Road.	Option is considered to mitigate the potential risk of motorists and pedestrians using flooded roads by alerting users of flooded roads.	Ongoing community education on the risks associated with driving through floodwaters is required.	Council would be responsible for construction and maintenance.	May be eligible for NSW Government funding.	TBD (varies depending on product), ranging from \$5,000 to \$20,000.	High	High
	RM06 (11.5.6)	Engage with the community to prepare an ongoing flood education program, with appropriate evaluation by Council and SES following implementation..	Engage with community to prepare an ongoing flood education program, with appropriate methods for program evaluation to be undertaken by SES and Council.	Flood awareness significantly improves preparedness for and recovery from flood events by building a more informed and flood resilient community.	Ongoing efforts to ensure information is not forgotten. Potential for residents to become bored or complacent with messaging.	Council in collaboration with other response agencies and community organisations.	May be eligible for NSW Government funding.	Annual Budget to be determined and allocated.	N/A	Moderate
	RM07 (11.5.7)	Undertake an Evacuation Assessment for Mullumbimby.	Undertake a detailed evacuation assessment for the Mullumbimby township for a range of design events.	Will provide an improved understanding of evacuation capability and capacity in Mullumbimby and identify a location suitable for an evacuation centre flood free up to the PMF.	Costs may be associated with outcomes of assessment.	SES and Council in cooperation	May be eligible for NSW Government funding	Moderate	High	Moderate



Table 3. North Byron Floodplain Risk Management Study and Plan (Part 2 of 3)

	Option ID (Section)	Option	Description	Benefits	Concerns	Responsibility	Funding	Cost	B/C Ratio	Priority
Flood Modification Measures	AC (12.1.3)	Further consideration of Avocado Court drainage modification.	Increase the network capacity along Avocado Court, Grevillea Avenue and Pine Avenue (600mm pipe increased to 900mm, 750mm to 1200mm and 900mm to 1200mm). Installation of three (3) additional inlets.	Reduction in above floor inundation and in number of properties affected by flood. In the 1% AEP event, flood levels are reduced significantly in Avocado Court and Grevillea Avenue, up to 0.25m and 0.7m.	Require minor ongoing annual maintenance cost is required.	Council	May be eligible for NSW Government funding.	\$550,000	3.43	Moderate
	BMU (12.1.2)	Further consideration of Billinudgel infrastructure improvements.	Infrastructure improvements include: - Lowering of the left embankment of the Billinudgel railway for a length of 60m with a depth varying between 1.5m and 2.5m. - Lowering of the left bank of the creek for a length of 150m with 0.5 - 1.0m in depth. - Removal of the railway bridge infrastructure for a width of 50 m across the waterway area.	Peak levels are reduced over a large area by up to 0.5 m in the 1% AEP event. Provides improved flood immunity to flood prone properties and to Wilfred Street (an evacuation road).	Further investigation and assessment required. Limited impact on properties.	Council	May be eligible for NSW Government funding.	\$850,000	1.47	Moderate
	SC (12.1.4)	Further detailed assessment of Saltwater Creek upgrade assessment and mitigation options for Mullumbimby	FRMS identifies that mitigation works in Saltwater Creek could provide improved flood immunity for properties in Mullumbimby. Four variations of this option were investigated and a preferred configuration was not identified. Option SC calls for more detailed investigation.	Assessment shows that mitigation works to Saltwater Creek have the potential to provide a reduction in flood levels and improved immunity to Mullumbimby properties.	High capital costs. Modification to the riverbed may affect bank stability and sediment transfer behaviour of the creek.	Council	May be eligible for NSW Government funding.	\$2,820,000	N/A	High
	WFG (11.4.4)	Develop guidance on the design and installation of fencing traversing waterways and channels	Council to consider providing guidance on the design and installation of fencing which traverse waterways. A number of existing agricultural fencing cross the waterways in the catchment area causing blockage.	Ensuring that this fencing is designed so as not to cause an obstruction to flood flow will generally improve the conveyance of this system.	Limited impact on properties.	Council	May be eligible for NSW Government funding.	Internal	N/A	Moderate
	FDC (11.4.6)	Implement debris control measures for Federation Bridge and Billinudgel Railway Bridge.	Introduction of maintenance policies and debris control structures to reduce the blockage potential at Federation Bridge and Billinudgel Railway Bridge.	Debris control structures encourage debris to align with the bridge opening and prevent accumulation and blockages of debris. Drainage maintenance measures are highly supported by the community.	These structures will collect substantial amounts of debris and require regular and continual maintenance, which can become costly and resource intensive.	Council	May be eligible for NSW Government funding.	TBD (varies depending on structure), including ongoing cost of maintenance	N/A	Low
	CDM (11.4.5)	Development of whole of catchment drainage model and overland flow path investigation.	A detailed catchment drainage model of the formal pipe network and overland flow paths should be developed.	Will provide an understanding of the flood risk due to overland flow and provide a model fit for the purpose of investigating localised drainage improvements.	Limited concerns with this option. Costs associated with development of this model however funding options are available.	Council	May be eligible for NSW Government funding.	Low to moderate capital costs, partial funding available	N/A	Low



	Option ID (Section)	Option	Description	Benefits	Concerns	Responsibility	Funding	Cost	B/C Ratio	Priority
	RW02 (11.4.3)	Develop a sediment transport model to investigate modification to the rock walls, as part of the Coastal Management Program Scoping Study for Cape Byron to South Golden Beach.	A detailed sediment transport model to investigate modification to the rock walls for the purpose of improved sediment transport, as part of the Coastal Management Program Scoping Study for Cape Byron to South Golden Beach.	Will provide an understanding of sediment transport processes due to the rock walls and will investigate options for improving sediment transport in Readings Bay.	Limited concerns with this option. Costs associated with development of this model however funding options are available.	Council	May be partially funded through NSW DPIE	Low to moderate capital costs, partial funding available	N/A	Low
	SGBA (11.4.1)	Implement the recommendations of the South Golden Beach levee audit.	Audit includes a number of recommendations, predominantly regarding the clearing of vegetation and ongoing maintenance of the levee.	Provide benefits to the South Golden Beach community as a method for providing ongoing maintenance of the levee.	Some costs associated with maintenance of levee. Levee audit notes there may be limitations as the inspection was visual only.	Council	May be eligible for NSW Government funding.	Internal	N/A	Low
	NCD (11.4.5)	Further consider viable options to implement the recommendations of the New City Road drainage assessment.	The assessment recommended the construction of culvert outlets with flap gates and upgrade the culvert crossings by maintaining the drainage channel.	Limited reduction on the 0.2EY flood levels and extent however reduce the time water ponds at the site.	Significant cost and ongoing maintenance cost. Limited reduction on the 0.2EY floor levels.	Council	May be eligible for NSW Government funding.	Moderate capital and ongoing costs.	N/A	Low



Table 4. North Byron Floodplain Risk Management Study and Plan (Part 3 of 3)

	Option ID (Section)	Option	Description	Benefits	Concerns	Responsibility	Funding	Cost	B/C Ratio	Priority
Property Modification Options	PM01 (11.6.1)	Further investigate raising eligible residential properties to reduce flood damages.	Council should consider formalising a voluntary house raising for the 11 properties identified in the assessment. Option includes raising the 11 identified buildings, to the level of the current day 1% AEP level + 500 mm freeboard. Part of this scheme should include a more detailed investigation into eligible properties	The frequency of over-floor inundation (and hence property damage) is significantly reduced by raising the dwelling above the Flood Planning Level. This option can provide benefits to eligible dwellings without impacting others.	Some residents may not want stairs due to health and mobility issues. Economic viability of this scheme would be directly linked with participation rates. Raised houses could encourage residents to 'shelter in place' during floods, however isolation and long durations of floods put them at high risk.	Council in consultation with flood affected property owners.	May be eligible for NSW Government funding.	\$792,000	1.44	High
	PM02 (11.6.2)	Consider establishing a Voluntary House Purchase scheme for eligible properties.	Council should consider formalising a voluntary house purchase (VHP) scheme for the 15 identified properties. Part of this scheme should include a more detailed investigation into eligible properties.	Removal of properties can help to restore the natural hydraulic capacity of the floodplain and reduces the number of people living in high flood risk areas.	Community appetite for or acceptance of VHP may be a challenge. VHP schemes are long term options and may take approximately a decade to implement.	Council in consultation with flood affected property owners.	May be eligible for NSW Government funding.	High capital and ongoing cost	< 0.1	Moderate
	PM03 (11.6.3)	Changes to land use zoning should consider flood compatibility based on the recommendations of the FRMS.	Option includes consideration of changes to land use zoning for identified areas in Mullumbimby, South Golden Beach and New Brighton. Update flood hazard overlay maps based on hazard classification and design event modelling in the FRMS.	Appropriate land use planning can assist in reducing flood risk and ensure development on flood affected areas is flood compatible. Progressive zoning can be used to encourage long term change in flood resilience, whilst overly restrictive zoning can discourage redevelopment that is more flood compatible causing areas to degenerate over time.	This amendment to the LEP would require Council to submit a planning proposal.	Council	N/A	Internal	N/A	Low
	PM04 (11.6.4)	Flood Planning Levels revised based on the recommendations of the FRMS.	Council to adopt residential and commercial Flood Planning Levels as determined in this FRMS&P: - 2050 Flood Planning Level should be based on the 1% AEP with 0.4 m sea level rise and 10% rainfall increase and 500 mm freeboard. - 2100 Flood Planning Level should be based on the 1% AEP with 0.9 m sea level rise and 20% rainfall increase and 500 mm freeboard.	FPLs are effective tools to reduce property damage to new development and redevelopment. FPLs may pertain to minimum floor levels or flood proofing levels depending on the type of development.	A planning proposal is required to amend the LEP and implement the new FPL. May be considered more onerous for developers.	Council	N/A	Internal	N/A	High
	PM05 (11.6.5)	Revise the Flood Planning Area based on the recommendations of the FRMS.	Adoption of FPA based on 1% AEP with 0.9 m sea level rise and 20% rainfall increase and 500 mm freeboard.	The FPA will provide clear guidance on the properties subject to flood related development controls.	A planning proposal is required to amend the LEP and implement the new FPA definition. Consultation would be required.	Council	N/A	Internal	N/A	Low



	Option ID (Section)	Option	Description	Benefits	Concerns	Responsibility	Funding	Cost	B/C Ratio	Priority
	PM06 (11.6.6)	Council consider updating DCP to incorporate the recommendations detailed in the FRMS.	A review of the DCP identified some suggestions where further refinement may support the objectives of the DCP and the usability of the document by applicants.	A Development Control Plan (DCP) provides guidelines to support the planning controls in the Local Environmental Plan developed by a council.	A planning proposal might be required.	Council	N/A	Internal	N/A	High
	PM07 (11.6.7)	Provide more detailed guidance on the principles of wet proofing, appropriate design and materials, with direct reference to available guidelines.	The current DCP includes provisions for applying flood proofing, depending on the land use and level of flood hazard. To further support this approach, Council may wish providing further guidance on the principles and appropriate materials, with direct reference to available guidelines.	Significantly reduce commercial, residential property damages, and associated stress and trauma. Reduced burden on the SES to help local residents prepare for floods, and decrease recovery times following floods.	Implementation of measures at time of construction and retrofitting may be considered onerous by developers and homeowners.	Council	N/A	Internal	N/A	High
	PM08 (11.6.8)	Undertake more detailed assessment of properties which may benefit from property level protection and include a requirement for an assessment of property level protection as part of the DCP2014 planning matrix criteria FL4.	These temporary measures include sandbags, plastic sheeting and other smaller barriers which fit over doors, windows and vents and are deployed by the occupant before the onset of flooding.	Cheaper option for existing properties and can be useful where there is frequent shallow flooding. Option can be applied to properties where Flood Proofing Measures are not practical.	Require adequate flood warning time as this option relies on someone to implement it.	Individual properties owners and business owners.	Community resilience grants may be available.	TBD (varies depending on product)	N/A	High
	PM09 (11.6.9)	Section 10.7 (5) certificates to provide further detail of flood behaviour. Consideration to providing property-level flood information via an online GIS platform.	Consider providing greater detail of flood information in Section 10.7(2) and (5) certificates to identify the property's flood hazard, hydraulic category and whether flood related development controls apply using high resolution outputs from this study.	The more informed a homeowner is, the greater the understanding of their flood risk. During a flood event this information can help prepare residents to evacuate and reduces the number of residents that elect to take shelter in high hazard areas.	Limited - s10.7(2) certificates already contain basic information. Council to provide further detail from current FRMS&P results. May increase demand on Council staff, however GIS systems can be established to provide this information efficiently.	Council	N/A	Internal	N/A	High
	PM10 (11.6.10)	Implement the recommendations regarding appropriate fill areas in the DCP2014.	Undertake further assessment of controls to manage cumulative development impacts. This future development investigation should consider several future development footprints under both current and future climate conditions.	Clear development controls to manage the cumulative impacts from development and an agreed future development footprint that produces an acceptable impact.	Additional scenario modelling is needed to understand specifically which areas of the floodplain are dictating the sensitivity of the catchment.	Council	N/A	Internal	N/A	High



4. REFERENCES

1. WMA Water
North Byron Shire Floodplain Risk Management Study
April 2020
2. NSW Government
Floodplain Development Manual: The management of flood liable land
April 2005

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Report No. 4.3 **Discussion of item requested by committee member Duncan Dey reagrding filling in no-fill zone of Marshalls Creek floodplain**

Directorate: Infrastructure Services

Report Author: Dominika Tomanek, Executive Assistant Infrastructure Services

5 **File No:** I2020/427

Summary:

10 This report has presented topic for discussion as requested by committee member Duncan Dey.

RECOMMENDATION:

That Council note the report.

15

REPORT

It was requested by committee member Duncan Dey to table the following item at the next Byron Shire Floodplain Committee meeting.

1. Duncan Dey's enquiry and Director's response to date on filling in no-fill zone of Marshalls Creek floodplain.

On 5 March 2020 the committee member Duncan Dey asked the below question:

Attached are photos of notices on the site and of a block-wall built for the purpose of taking fill at South Golden Beach, within a no-fill zone declared under the Marshalls Creek Floodplain Management Plan.

Could you and the Chair of the Floodplain Committee (Cr Lyon, I think) please put this matter on the Agenda for our meeting scheduled for 24 March? Please include the following, my view and a question on the matter.

My view is that Council and the state have invested deeply and behaved cordially to come up with Plans (like the one being developed right now) for sharing the joys and burdens of occupying floodplains. What is happening at 1 Kallaroo Circuit seems to break all those rules. If this is accepted, why would anyone conform to a Floodplain Management Plan.

My question is how did this happen?

Council has been notified by other shocked residents of the area. People known to be involved include:

- Mark Thomas of Coastline Certification;
- Council's Greg Smith and Dylan Johnstone.



Director responded to the question on 10 March 2020 as below;

5 *The development you have requested information about was approved by Council but the construction certificate and construction is being managed by a private certifier. Conditions of consent required the floor levels to be raised to the currently adopted 2050 Flood Planning Level to comply with Council's minimum floor level requirements. This is higher than the surrounding developments due to changes in flood planning heights, following revised flood studies and plans that considered more recent flood events and Council's climate change parameters, since adoption of the 1997 Marshalls Creek Floodplain Management Plan.*

10 *The land was originally filled to above the 1 in 100 year flood level in the early 2000s (WAE plans are dated 30/1/2002) as part of the "Fern Beach Estate" subdivision, which was approved by the Land and Environment Court in 1997.*

15 *As identified in the work as executed (WAE) plans (extract below), the level of the land is in the order of 3.5m AHD and the 100 year flood level was estimated to be 3.2m AHD in the Tweed – Byron Coastal Creeks Flood Study (March 2010).*

20 *The Tweed Byron Coastal Creeks Flood Study, Byron Shire Council Climate Change Assessment (March 2010) indicates a 2050 flood level in the vicinity of the site of 3.3m AHD (figure 3-2) and does not identify the site as being in a flood hazard area (figure 3-4). It is also noted that the land is not identified as being in a flood hazard area in figure 106 of the recently exhibited draft North Byron Flood Plain Management Study.*

25 *Accordingly, the development is consistent with the flood planning matrix in Chapter C2 of Council's DCP 2014, which does not prohibit filling in the "No Hazard" flood hazard areas.*

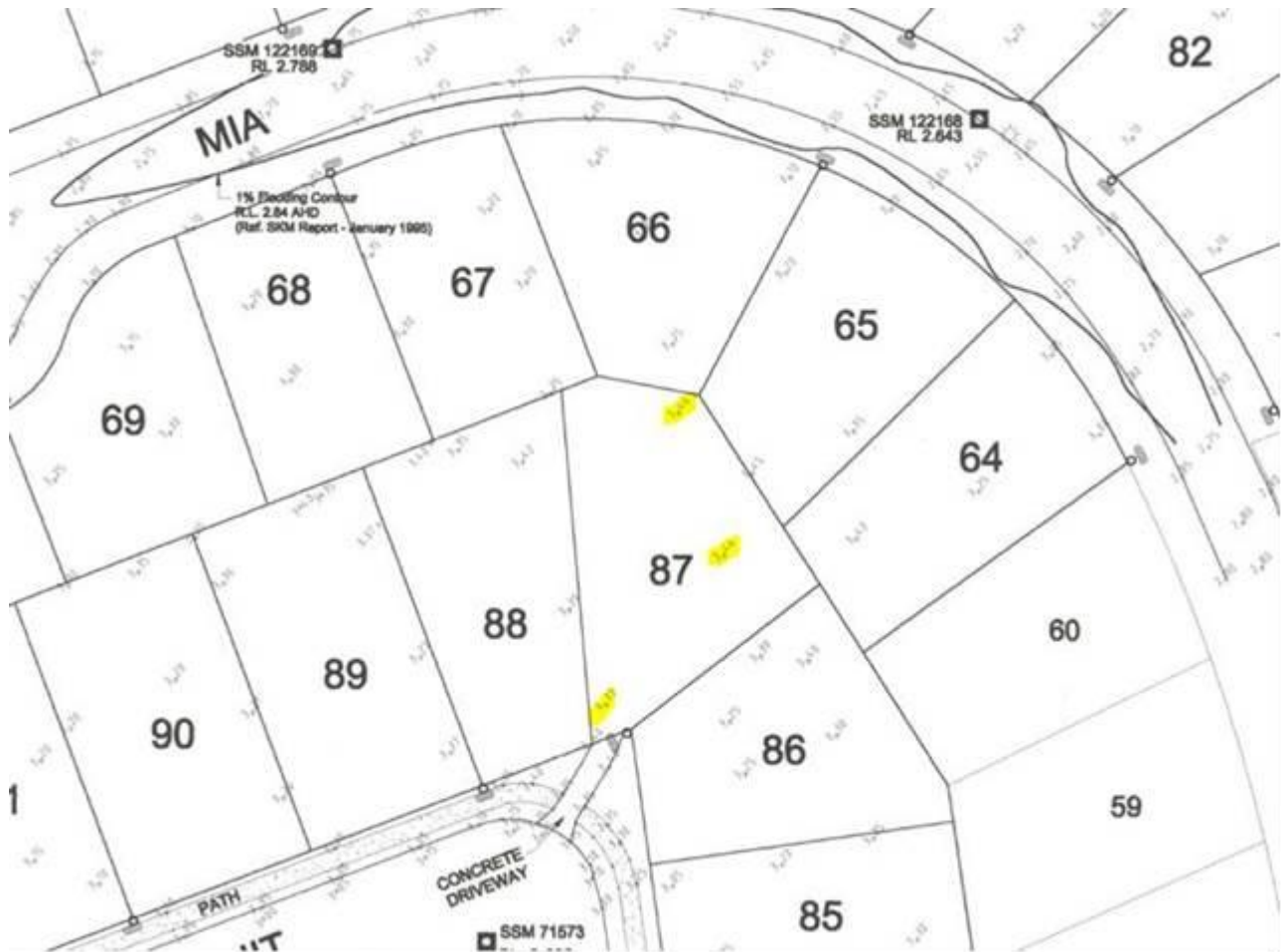
30 *Further the above court ruling effectively removed the no fill area over this area of land. Therefore Council does not have an avenue to successfully stop filling in this area.*

35 *It is also noted that The North Byron Floodplain Management Plan, which is coming soon, will update all the no fill areas compared to the 1997 Flood Plan and this area is unlikely to be covered by a no fill zone.*

40 *We do not believe Council is able to prevent this filling from occurring, however, we are working with the certifier to reduce the fill where practical to ensure the finished development does not create any stormwater drainage issues for the neighbouring properties.*

Council has also received correspondence from neighbour raising similar concerns and will respond accordingly following further discussions with the Certifier.

Extract of WAE Plans:



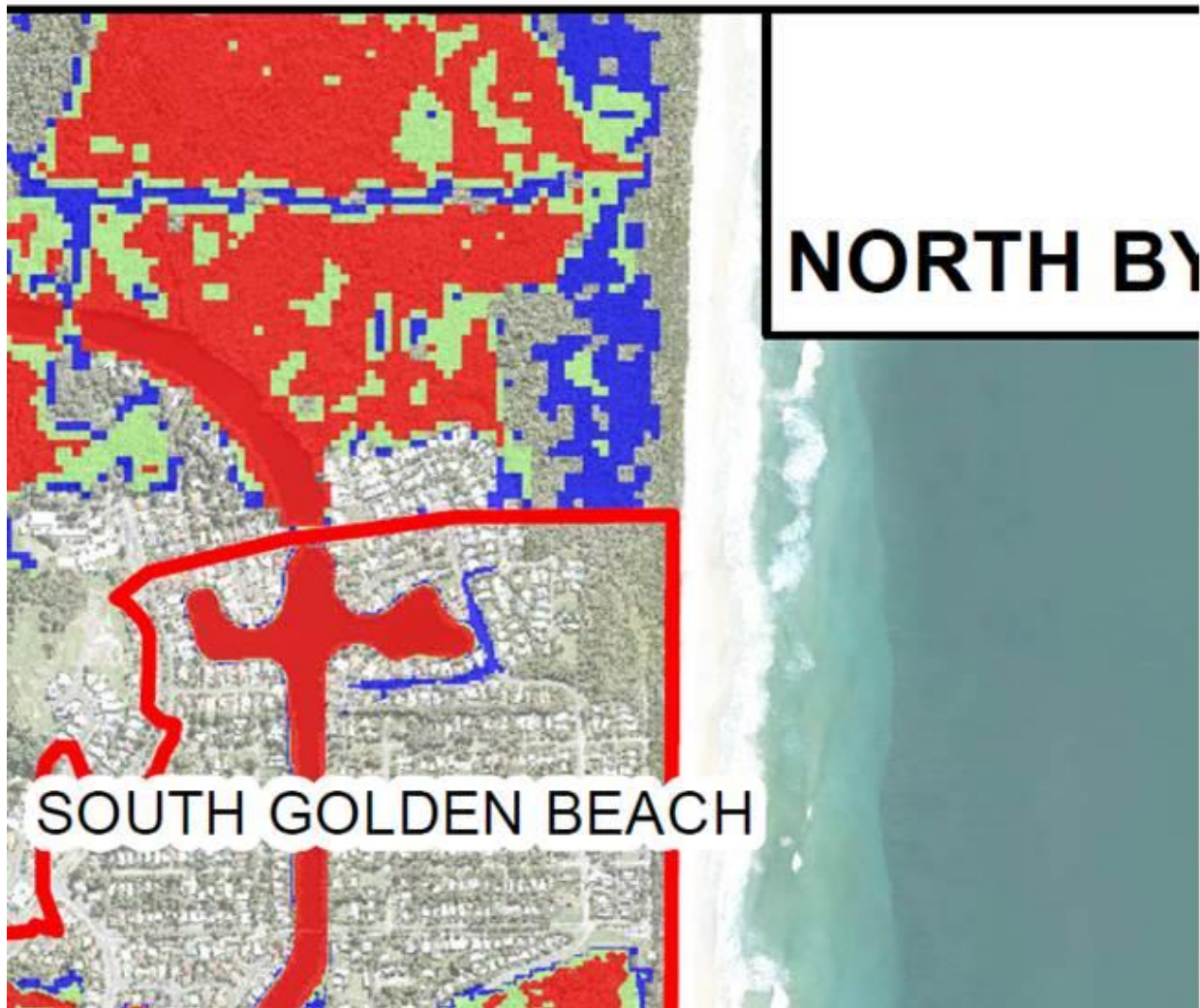
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Extract of Figure 3-4 of Tweed Byron Coastal Creeks Flood Study, Byron Shire Council Climate Change Assessment (March 2010):



5

Extract of Figure 106 of the recently exhibited draft North Byron Flood Plain Management Study:



Legal/Statutory/Policy Considerations

- 5 NSW Councils are expected to prepare Floodplain Risk Management Studies and Plans for flood prone catchments within their local government areas. These documents must be prepared in accordance with State Government Policy.

The NSW Floodplain Development Manual 2005 is the current policy used by State Government for the preparation of such documents.

- 10 This project is following the methods prescribed in the NSW Floodplain Development Manual for completing Floodplain Risk Management Studies and Plans.

Financial Considerations

- 15 There are not financial issues with this stage of the project.

Consultation and Engagement

- 20 This issue was relates to an approved DA, therefore the Manager Sustainable Development, Development Engineering Supervisor and Team Leader Planning Services were consulted with in developing this response.

Report No. 4.4 **Discussion of item requested by Cr Lyon**
Directorate: Infrastructure Services
Report Author: Dominika Tomanek, Executive Assistant Infrastructure Services
File No: I2020/429

5

Summary:

10 This report has presented topic for discussion as requested by Cr Lyon.

RECOMMENDATION:

That Council note the report

15

REPORT

It was requested by the chairman of the committee Cr Lyon to table the following item at the next Byron Shire Floodplain Risk Management Committee meeting.

1. Discussion whether New Brighton is being catered for appropriately in these flood mitigation conversations as a concern has been expressed that it is too focused on Billinudgel.
2. Condition of the "Drainage Easement" between Rangal Road and Gloria Street, South Golden Beach/Ocean Shore.

In relation to the item 1, the management advice is as below:

New Brighton is a low lying area impacted by both flood and coastal hazards. It is staff opinion that the Floodplain Risk Management Study has considered this area to level feasible. Large scale redevelopment and filling of the area is the only possible solution to prevent the area flooding and this level of works is unrealistic.

The Floodplain Management Plan recommends the raising of access roads to improve access during a flood event and the drainage investigations recommended can investigate drainage improvements to reduce the impacts of smaller events and rainfall in the run up to a flood. These are considered the only realistic options available to this area.

In relation to the item 2, Cr Lyon received the enquiry from the Byron Shire resident as below:

The condition of the drainage easement between Rangal Road and Gloria Street, South Golden Beach, is of serious concern to me, it "should" drain into the Capricornia Channel if allowed and the water eventually should be released into the Yelgen and Marshalls Creeks. AT THE MOMENT IT IS BLOCKED

I have spent the summer clearing the vegetation and dumped green waste, predominantly palm fronds from the easement behind me - a lot of physical effort for a 74 year old woman. However, I am unable to clear the entire easement. A few other neighbours have also been diligent.

As one progresses west along the easement, conditions get worse and worse. THERE IS AN ENORMOUS AMOUNT OF ACCUMULATED VEGETATION, DUMPED GREEN GARDEN WASTE, ESPECIALLY PALM FRONDS AND GENERAL DEBRIS. At one stage there is a LARGE GOLDEN CANE PALM growing right in the middle of what should be the channel, a broken down fence and part of a recently constructed garden shed.

I am unable to walk along the easement and the water is unable to flow except when the drain is in full flood. Directly behind my property the flood waters are barely moving. As a result the waters are stagnating in large pools. These are now filled with a BROWNY GREEN, FUZZY, SLIMY SLUDGE that stinks. The local sewer runs parallel with the easement and the condition of the the waters, indicates that it may have overflowed during the recent rains. This situation has created a DANGEROUS ENVIRONMENTAL HAZARD for children, animals and the community at large.

I ask that council complies with it's commitment to maintain the drainage system, as per it's responsibility for managing flood affected areas and FREE THIS EASEMENT AS A MATTER OF URGENCY BEFORE PEOPLE START TO GET SICK.

Utilities Department Team Leader (Stormwater and Sewer Maintenance) walked the easement and met with residents on the 24th February 2020.

Works will require an excavator, bobcat and a couple of trucks and take approximately 5 days to complete.

- 5 Tree roots will need to be removed or ground down to reduce vegetation build up and some stands of clumping palms and two palm trees will need to be removed along with garden waste. The drain requires reshaping to regain some fall towards the flood pump.

- 10 Council will do a letter drop to the residents explaining what will be done and also a request for people to stop putting garden waste in the easement and use the green bins provided. Works are currently planned to be carried out from the 30th March to the 3rd April 2020.

Legal/Statutory/Policy Considerations

- 15 NSW Councils are expected to prepare Floodplain Risk Management Studies and Plans for flood prone catchments within their local government areas. These documents must be prepared in accordance with State Government Policy.

- 20 The NSW Floodplain Development Manual 2005 is the current policy used by State Government for the preparation of such documents.

This project is following the methods prescribed in the NSW Floodplain Development Manual for completing Floodplain Risk Management Studies and Plans.

- 25 Provision of stormwater infrastructure is a legitimate function of local government under the Local Government Act 1993. To the extent that the provision of stormwater infrastructure protects public roads, other infrastructure, Council land, Crown land, Private land and the community. Council is also responsible for drainage under the Roads Act 1993.

- 30 In all cases, Council must meet its obligation to provide a satisfactory and safe level of drainage for the Shire's residents and a drainage network which is maintained in a condition which is not likely to endanger the Shire's residents during or after a rainfall event.

Financial Considerations

- 35 There are not financial issues.

Consultation and Engagement

Only as per the public exhibition process for the study document.