

# 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	<b>Conference Room, Station Street, Mullumbimby</b>
Date	<b>Thursday, 13 June 2019</b>
Time	<b>2.00pm</b>

Phillip Holloway  
Director Infrastructure Services

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## 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 Local Government Act (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 Section 448 of the Local Government Act.

**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.

### Participation in Meetings Despite Pecuniary Interest (S 452 Act)

A Councillor is not prevented from taking part in the consideration or discussion of, or from voting on, any of the matters/questions detailed in Section 452 of the Local Government Act.

**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 if the provisions in S451 of the Local Government Act apply (particularly if you have a significant non-pecuniary interest)

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## 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 Division 2A of Part 6 of 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 19 February 2019

**4. STAFF REPORTS**

**Infrastructure Services**

- 4.1 North Byron Floodplain Risk Management Study and Plan - Update.....4

**STAFF REPORTS - INFRASTRUCTURE SERVICES****Report No. 4.1 North Byron Flodplain Risk Management Study and Plan - Update****Directorate:** Infrastructure Services**Report Author:** James Flockton, Drain and Flood Engineer**File No:** I2019/840**Summary:**

Following the previous North Byron Floodplain Risk Management Study and Plan update report and Floodplain Management Committee Meeting, WMA Water has been working on various aspects of the Floodplain Risk Management Study.

Various modelling results are provided in this report for discussion with the committee at the upcoming meeting.

**RECOMMENDATION:**

1. That Council approve the design event modelling mapping for inclusion in the final Floodplain Risk Management Study and Plan documentation.
2. That Council approve the following mitigation options as the second set of flood mitigation options for assessment in the study:
  - Lowering of the Ocean Shores Golf Course Weirs
  - Removal of the Ocean Shores Golf Course Weirs
  - Removal of the Brunswick River Training Walls
  - Levee for Mullumbimby
  - Billinudgel Infrastructure improvements
  - Upstream storage
  - Reduction of debris collection risk at Federation Bridge
  - Dredging extended to side tributaries in Mullumbimby
  - Additional Rock Wall alteration
3. That in order for project delivery and grant milestone targets to be met Council approve changes to the current 2019 Floodplain Management Committee Meeting Schedule. The 31 October 2019 meeting be moved to the end of September 2019 and an additional meeting is added at the end of November 2019.

**Attachments:**

- 1 North Byron FRMS&P - FMC 5 Memo to committee, E2019/39800 , page 9 [9](#)

**REPORT**

Floodplain Management Committee Meeting Number 4 resulted in finalisation of the calibration results and acceptance of the North Byron Flood Study.

The model is now considered being fit for purpose for preparing the draft Floodplain Risk Management Study. As such, it has now been possible to commence a number of the modelling elements required for the Floodplain Risk Management Study. Namely:

1. Draft revised design event maps
2. Draft revised climate change maps
3. Draft blockage sensitivity assessment
4. Draft mitigation results for six scenarios
5. Establishing the base case property database

Point's 1 to 4 are provided at attachment 1.

The following section describes the modelling which has been undertaken, this is for discussion at the upcoming Floodplain Management Committee meeting. These sections will be presented and discussed at the committee meeting.

Design Events

New design events, in accordance with the tender specification, have been modelled using the updated Flood Model and are provided in Attachment 1 for review.

WMA Water have analysed the differences between these and the BMT Flood Study mapping. In some locations there are some notable changes to the outputs, however these can all be related to the model upgrades. A brief summary of the key changes is provided below.

**Upper Catchment**

The hydraulic model was extended into the upper catchment (Main Arm and the Pocket) – resulting in "Newly Flooded" areas in these locations

The extension of the model has also impacted flood levels at the previous upstream boundary, however these impacts are localised and to be expected.

**Brunswick River:**

1. The Brunswick River bend losses in Mullumbimby were reduced to improve calibration. This has caused a decrease in flood levels upstream of Mullumbimby and an increase in flood levels downstream. This is most apparent for more frequent events.
2. The Brunswick River downstream boundary condition was updated for design events based on the latest *Floodplain Risk Management Guideline on Modelling the interaction of Catchment Flooding and Oceanic Inundation in Coastal Waterways*. For the 1% AEP and higher (0.5% AEP, 0.2% AEP and PMF), the guideline recommends adopting a peak ocean water level of 2.10m AHD. The Flood Study used a 2.60m AHD level based on "a coastal assessment undertaken some 20 years ago" (Flood Study, Ch8.6, p95). This change

has resulted in reduced flood levels at Brunswick mouth and upstream and is most evident in the PMF.

#### **Simpsons Creek:**

1. The Brunswick Heads domain was updated to be modelled using a 5m grid. This area of the model includes Simpsons Creek. This refined modelling coupled with the changes in the hydrological model, increases the flood levels upstream of the town.

#### **Marshalls Creek:**

1. The Railway Bridge modelling at Billinudgel was refined and structures were added under the highway. These improvements to modelling in this location and combined with the updated hydrology has reduced flood levels upstream of Billinudgel.
2. In South Golden Beach and Ocean Shores, the flood levels have increased in all events except the PMF. Significant changes in this area include, a smaller grid size in Ocean Shores and updates to Marshalls Creek bathymetry. These changes have, impacted flood levels in this area.
3. Updates to the hydrology has increased Yelgun Creek inflow through Kallaroo Circuit, impacting flood level in the Capricornia Canal up to Marshalls Creek.

#### Climate Change Sensitivity

Attachment 1 provides details on the scenarios used to assess Climate Change Sensitivity and the flooding results from these scenario's.

It is noted the current climate conditions have been run in accordance with the latest Office of Environment and Heritage (OEH) guidelines (OEH Floodplain Risk Management Guide - Modelling the Interaction of Catchment Flooding and Oceanic) rather than Council policy. This is considered to be current best practice and will be the recommended method within the coming Climate Change Policy update.

This methodology has lowered the current climate 100 year ocean level to 2.1m AHD. From previous reviews of ocean levels it appeared the old level of 2.6m AHD included an allowance for climate change, therefore, the lowering of water levels for current climate is not surprising.

Further details on OEH policy can be found at <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Water/Floodplains/modelling-catchment-flooding-oceanic-inundation-150769.pdf?la=en&hash=41092E03528FEF91161826E5FE5D9E5CD2D13598>

Further analysis on the results of this mapping and recommendations will be provided at the meeting and the next FMC meeting. These results have been recently mapped and not been investigated to date.

#### Hydraulic Structures Blockage Sensitivity Assessment

The hydraulic structures represented in the model have been tested for their sensitivity to potential debris blockage during an event.

Any structure less than 7m in the diagonal has been assumed either 50% or 100% blockage and modelled for the 1% AEP event. Draft mapping is presented in Attachment 1. Compared to the base case (no blockage), there is minimum impact as a result of blockage, as most of the major structures are far greater in size than the blockage threshold.

Early Mitigation Options

Draft results from six of the early identified mitigation options have been modelled and presented in Attachment 5 for the 1% AEP design event only, namely:

1. Modification to Brunswick River mouth rock wall alignment;
2. Dredging of lower Marshalls Creek;
3. Dredging Brunswick River at Mullumbimby;
4. Two ocean outlets (in combination);
5. Levee at Billinudgel (one iteration);
6. Diversion of Kings Creek.

Further analysis on the results of this mapping and recommendations will be provided at the meeting and the next FMC meeting. These results have been recently mapped and not been investigated to date.

The below database will be used to advise what reductions in flood levels mean in terms of reducing damage to property and other associated impacts to property owners.

Property Database

The floor level and property survey combined with the FRMS modelling has been used to establish the base case property database. For every property in the catchment results from the design event and scenario mapping are extracted. This database not only forms the basis for flood damage assessment, it is also becomes a useful tool for identifying vulnerable properties and localised hotspots. An example will be shown at the FMC meeting, however, the database has a large file size making provision to the committee difficult.

**Key issues**

A rigorous review of the existing flood model is of the utmost importance for the North Byron Floodplain Risk Management Study and Plan. Therefore it is important the committee review the mapping provided and provide comment at the meeting.

**Next steps**

Over the coming months the Draft Floodplain Risk Management Study document will be prepared and reported to the committee as it progresses.

Moving forward, work will continue on analysing the existing flood risk with development of Flood Emergency Response Classifications, identification of evacuation capability, Climate Change results and the flood damages assessment. Further potential mitigation options will be identified and reporting on the results of these options in detail. A list of further mitigation options will be identified for initial desktop evaluation, with further modelling of the short-listed options.

Other future tasks include:

1. Drainage assessments for Mullumbimby and Brunswick Heads,
2. Land use planning assessment and cumulative development impacts assessment.
3. Further mitigation modelling and associated assessments,

4. Emergency Management tasks include Education material, Evacuation Plans and Evacuation Centre Reviews and Flood emergency response classifications.
5. levee overtopping / failure assessment

- 5 The Draft Floodplain Risk Management Plan will be prepared once the draft study document has been finalised and received support from the committee.

***Legal/Statutory/Policy Considerations***

- 10 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.

- 15 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.

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***Financial Considerations***

There are no financial consideration for the committee to consider within this report.

***Consultation and Engagement***

The Office of Environment and Heritage have been consulted between FMC meetings to ensure they are aware of where the project has been heading.

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# Memorandum



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TO: James Flockton  
FROM: Ella Harrison  
DATE: 28 May 2019  
SUBJECT: Floodplain Management Committee project update  
PROJECT: North Byron Floodplain Risk Management Study and draft Plan – 117098

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## 1. OVERVIEW

FMC Meeting 4 resulted in finalisation of the calibration results and acceptance of the North Byron Flood Model now being fit for purpose for preparing the draft Floodplain Risk Management Study.

As such, it has now been possible to commence a number of the modelling elements required for the Floodplain Risk Management Study. Namely:

- Draft revised design event maps (Attachment 1)
- Draft revised climate change maps (Attachment 2)
- Draft blockage sensitivity assessment (Attachment 3)
- Draft mitigation results for six scenarios (Attachment 4)
- Establishing the base case property database (not attached due to size and format)

The following section describe the modelling which has been undertaken, for discussion at the upcoming Floodplain Management Committee.

## 2. FRMS MODELLING

### 2.1. Design events

New design events, in accordance with the tender specification, have been modelled using the updated Flood Model and are provided in Attachment 1 for review.

WMAwater have analysed the differences between these and the BMT Flood Study mapping. In some locations there are some notable changes to the outputs, however these can all be related to the model upgrades. A brief summary of the key changes is provided below.

#### Upper Catchment:

- The hydraulic model was extended into the upper catchment (Main Arm and the Pocket) – resulting in "Newly Flooded" areas in these locations

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North Byron Floodplain Risk Management Study and draft Plan – 117098: FMC5\_memo\_13June2019.docx: 28 May 2019

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- The extension of the model in has also impacted flood levels at the pervious upstream boundary, however these impacts are localised and to be expected.

**Brunswick River:**

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- In South Golden Beach and Ocean Shores, the flood levels have increased in all events except the PMF. Significant changes in this area include, a smaller grid size in Ocean Shores and updates to Marshalls Creek bathymetry. These changes have, impacted flood levels in this area.
- Updates to the hydrology has increased Yelgun Creek inflow through Kallaroo Circuit, impacting flood level in the Capricornia Canal up to Marshalls Creek.

## 2.2. Climate Change Sensitivity

Climate change scenarios have been modelled in alignment with current Byron Shire Council Climate Change Strategic Planning Policy (2014), shown below.



Table 1: Climate Change Scenarios for use in Flood Modelling and Flood Planning				
Scenario	Predicted Sea Level Rise (Metres above 1990 mean sea levels)	Catchment inflow (rainfall event)	Ocean Boundary Peak Tailwater Condition in (M)AHD	Increase in rainfall intensity
100 year event Current Conditions	0	20 year ARI 100 year ARI	*2.6 (Ocean Dominated) 2.2 (Rain Dominated)	0
100 year event in 2050	0.4	20 year ARI 100 year ARI	2.6 (Ocean Dominated) 2.4 (Rain Dominated)	0
100 year event in 2100 (FPL event)	0.9	20 year ARI 100 year ARI	3.1 (Ocean Dominated) 2.9 (Rain Dominated)	0
Sensitivity test 1	0.4	20 year ARI 100 year ARI	2.6 (Ocean Dominated) 2.4 (Rain Dominated)	10%
Sensitivity test 2	0.9	20 year ARI 100 year ARI	3.1 (Ocean Dominated) 2.9 (Rain Dominated)	30%
Sensitivity test 3	0.9	100 year ARI	3.1 (Ocean & Rainfall Dominated)	30%

**Source:** Figures are in accordance with recommendations from DECCW Sea Level Rise Policy Statement April 2009 and DECCW Practical Consideration of Climate Change guideline 2007.

\*The 100 year peak ARI ocean level of 2.6m AHD is based on a coastal assessment undertaken nearly 30 years ago and includes, wave and wind set up and barometric pressure effects. It is considered to have some allowance for sea level rise but the amount is unknown. It is the accepted level across the state for the 100 year flood tailwater condition and its application in Byron Shire dates back to the Brunswick River Flood Study (1986) and Belongil Creek Flood Study (1986).

The scenarios and corresponding design events and tailwater conditions modelled in response to this policy is detailed below, and draft mapping provided in Attachment 2.

Scenario	Modelled Event and Tailwater Conditions
<b>Current Conditions</b>	Run in accordance with latest OEH guidelines, not climate change policy
<b>2050 plus 0.4m sea level rise</b>	5% AEP + 2.6m AHD tailwater 1% AEP + 2.4m AHD tailwater 0.2% AEP + 2.6m AHD tailwater PMF + 2.6m AHD tailwater
<b>2100 plus 0.9m sea level rise</b>	5% AEP + 3.1m AHD tailwater 1% AEP + 2.9m AHD tailwater 0.2% AEP + 3.1m AHD tailwater PMF + 3.1m AHD tailwater
<b>Sensitivity test 1</b>	20% AEP + 10% rainfall increase + 2.6m tailwater 1% AEP + 10% rainfall increase + 2.4m tailwater 0.2% AEP + 10% rainfall increase + 2.6m tailwater PMF + 10% rainfall increase + 2.6m tailwater
<b>Sensitivity test 2</b>	20% AEP + 30% rainfall increase + 3.1m tailwater 1% AEP + 30% rainfall increase + 2.9m tailwater 0.2% AEP + 30% rainfall increase + 3.1m tailwater

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North Byron Floodplain Risk Management Study and draft Plan – 117098: FMC5\_memo\_13June2019.docx: 28 May 2019

3

	PMF + 30% rainfall increase + 3.1m tailwater
<b>Sensitivity test 3</b>	1% AEP + 30% rainfall increase + 3.1m tailwater (0.2% AEP and PMF scenarios covered in Sensitivity Test 2)

### 2.3. Hydraulic Structures Blockage Sensitivity Assessment

The hydraulic structures represented in the model have been tested for their sensitivity to potential debris blockage during an event.

Any structure less than 7m in the diagonal has been assumed either 50% or 100% and modelled for the 1% AEP event. Draft mapping is presented in Attachment 3. Compared to the base case (no blockage), there is minimum impact as a result of blockage, as most of the major structures are far greater in size than the blockage threshold.

### 2.4. Early Mitigation Options

Draft results from six of the early identified mitigation options have been modelled and presented in Attachment 4 for the 1% AEP design event only, namely:

- Modification to Brunswick River mouth rock wall alignment;
- Dredging of lower Marshalls Creek;
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## 3. PROPERTY DATABASE

The floor level and property survey combined with the FRMS modelling has been used to establish the base case property database. For every property in the catchment results from the design event and scenario mapping are extracted. This database not only forms the basis for flood damage assessment, it is also becomes a useful tool for identifying vulnerable properties and localised hotspots. An example will be shown at the FMC.

## 4. NEXT STEPS

Moving forward, work will continue on analysing the existing flood risk with development of Flood Emergency Response Classifications, identification of evacuation capability, and the flood damages assessment. Further potential mitigation options will be identified. A long-list of options will be identified for initial desktop evaluation, with further modelling of the short-listed options.























































































































































