

Department of Planning and Environment

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Lismore Road, Bangalow


Flood Planning Advice Report

Felicity Greenway (Chair)

Peter Williams

Juliet Grant

5 May 2023



Acknowledgement of Country

The Department of Planning and Environment acknowledges that it stands on Aboriginal land. We acknowledge the Traditional Custodians of the land and we show our respect for Elders past, present and emerging through thoughtful and collaborative approaches to our work, seeking to demonstrate our ongoing commitment to providing places in which Aboriginal people are included socially, culturally and economically.

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Lismore Road, Bangalow

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Defined terms

Term	Definition
AEP	Annual Exceedance Probability
AHD	Australian Height Datum
Council	Byron Shire Council
BCD	Biodiversity Conservation Division of NSW Department of Planning and Environment
DA	Development Application
Department	Department of Planning and Environment
Flood Inquiry	NSW Flood Inquiry (July 2022)
Flood Impact Assessment	Bangalow Industrial Estate Flood Impact Assessment (prepared by BMT, dated May 2021)
ha	hectare
INSW	Infrastructure NSW
LGA	Local government area
Panel	Flood Advisory Panel
PLUS	Planning and Land Use Strategy Division of NSW Department of Planning and Environment
PLUS Request	The request for advice from PLUS to the Panel, dated 9 January 2023 – see Section 1.1.
PMF	Probable Maximum Flood
Planning Proposal	150 Lismore Road, Bangalow planning proposal – PP-2021-3615
Proponent	Landholder – Andrew More
SES	NSW State Emergency Service
Site	150 Lismore Road Bangalow, 1.39 ha area shown in Figure 1
TAG	Flood Technical Advisory Group
TAR	Flood Technical Advisory Report
TfNSW	Transport for NSW

1 Introduction

1. The Department of Planning and Environment (**Department**) has established Flood Advisory Panels (**Panel/s**) to provide advice regarding the flood risk associated with certain 'high risk' planning proposals and other planning-related matters, in light of the recommendations of the NSW Flood Inquiry 2022 (**Flood Inquiry**). The Panel review process for these matters is intended as an interim measure pending the flood planning work of the NSW Reconstruction Authority, in accordance with the Flood Inquiry recommendations.
2. A Technical Advisory Group (**TAG**) was also established by the Department to deliver expert technical advice to Panels in accordance with its terms of reference (12 December 2022) and at the directions of individual Panels. The advice of the TAG is not binding on the Panels nor on the Department's Planning and Land Use Strategy (**PLUS**) division, which remains the delegated decision maker for the planning proposals referred to the Panels.
3. On 8 September 2022 Planning Proposal PP-2021-3615 (**Planning Proposal**) was submitted to the Department for finalisation, having completed the Gateway and exhibition processes. The Planning Proposal seeks to amend the *Byron Local Environmental Plan 2014* to rezone part of 150 Lismore Road, Bangalow from RU1 (Primary Production) to IN1 (General Industrial) and E3 (Environmental Management) (see Section 2 for further detail).
4. On 9 January 2023 the Panel received a request for advice from PLUS (**PLUS Request**) in relation to the Planning Proposal, which is detailed in Section 1.1 below.
5. Acting Deputy Secretary Felicity Greenway (Chair), and independent members Dr Peter Williams and Juliet Grant were appointed to constitute the Panel with respect to this request.

1.1 Advice Request

6. The PLUS Request to the Panel sought advice on whether the Planning Proposal adequately addresses flood risk, including evacuation, having regard to the Flood Inquiry's recommendations. The PLUS Request asks the Panel to advise, if the planning proposal addresses the Inquiry recommendations, whether it can be varied to do so or whether the Planning Proposal should be refused.

1.2 Material Considered by the Panel

7. In preparing this advice to PLUS, the Panel reviewed the material (**Material**) detailed in Appendix A and submitted with the Planning Proposal, met with key stakeholders, visited the Site and sought advice from the TAG.
8. The TAG was requested to advise whether the Planning Proposal adopts a tolerable, risk-based flood planning level considering the first 12 documents listed in Appendix A. The TAG advice was provided prior to state agency stakeholder input and later input by the Proponent, subsequently received by the Panel. The TAG's advice is summarised in the Technical Advice Report (**TAR**) dated 13 April 2023. The TAG advice is a compilation from three independent experts.
9. The TAG and Panel advice is provided in reference to the Planning Proposal boundary under current consideration by the Department (see **Figure 1**).

10. The Panel received written advice from three stakeholder agencies, NSW State Emergency Service (**SES**), Transport for NSW (**TfNSW**) and Infrastructure NSW (**INSW**), see **Appendix A**.
11. The Panel also considered additional updated flooding information provided by the Proponent on the 13 April 2023. This included PMF heights, additional hazard mapping and a hydrograph showing flood duration. This information was not available to the TAG, other stakeholder agencies, PLUS or Council.

1.3 The Panel's Meetings

12. As part of its advice, the Panel met with various stakeholders as set out in **Table 1**.

Table 1 – Panel's Meetings

Meeting	Date
PLUS	09 March 2023
Council	03 April 2023
Site Inspection	05 April 2023
Proponent	06 April 2023

2 Planning Proposal

2.1 Site and Locality

13. 150 Lismore Road Bangalow (the **Site**) is located approximately 1.5 kilometre (km) southwest of the township of Bangalow, and approximately 11 km southwest of Byron Bay in the Byron Shire local government area (LGA) (see **Figure 1**).
14. The 1.39-hectare (**ha**) Site forms the southern portion of Lot 4 DP635505 which is separated by Maori Creek, which is part of the broader Byron Creek catchment which ultimately connects to the Wilsons River at Nashua.
15. The portion of Lot 4 DP635505 north of Maori Creek contains a single residential dwelling and does not form part of the Planning Proposal.
16. The land is zoned RU1 Primary Production and is primarily used for grazing. Surrounding land is used for a mixture of agricultural and industrial purposes, notably featuring a small industrial precinct adjacent to the site on Dudgeons Lane (see **Figures 1 and 2**).



Figure 1. 150 Lismore Road, Bangalow identified in yellow (Source: BMT Flood Impact Assessment 2021)



Figure 2. Current zoning of site and adjacent land (Source: Council's Planning Proposal Report July 2022)

2.2 Background

17. The Site (see **Figure 1**) has been identified within the Byron Shire Council's (**Council**) *Business and Industrial Lands Strategy 2020* as investigation area for future industrial and urban service lands. The Panel understands this is the only area in the strategy identified for investigation which has lodged a planning proposal. The strategy notes flooding amongst several key issues for further investigation before the Site can be utilised.
18. The following table provides a brief history of the Planning Proposal to date.

Table 2. Timeline of Lismore Road Planning Proposal

Date	Proposal Stage	Comment
25 June 2021	Planning Proposal Submitted	The original planning proposal sought to rezone RU1 land to a combination of IN1 General Industry and (then) E3 (now C3) Environmental Management.
13 October 2021	Gateway Determination Issued	Several Gateway conditions were issued including the requirement to prepare a Traffic Impact Assessment. Other conditions related to consultation with agencies and ensuring consistency with the ongoing E-Zone Review.
11 April – 11 May 2022	Exhibition	During the public exhibition of the Planning Proposal six agency submissions were received and six public submissions were received.
25 August 2022	Council Post-Exhibition	Council resolved to make several changes to the exhibited Planning Proposal including to reduce the area of IN1 zoning and increase the C3 zoning to provide greater environmental buffer for Maori Creek.
8 September 2022	Submitted for Finalisation	The proposal was submitted to PLUS for finalisation in September 2022 following Council's changes.

2.3 Planning Proposal

19. The Proposal is seeking to:

- Rezone the Site from RU1 (Primary Production) to a combination of IN1 (General Industrial) (0.76 ha) and C3 (Environmental Management) (1.27 ha) (see **Figure 3**);
- Apply a 0.75:1 floor space ratio on the IN1 (General Industrial) zoned land; and
- Decrease the minimum lot size to 1000 square metres from 40 ha on the proposed IN1 (General Industrial) zoned land.

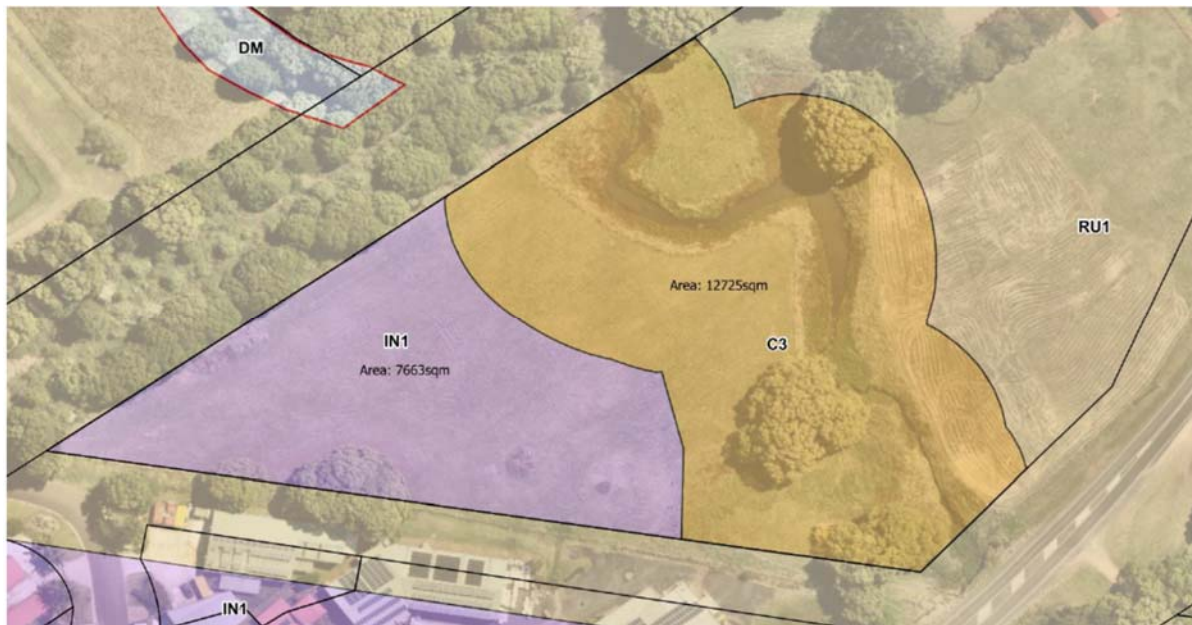


Figure 3. Proposed zoning of Site (Source: Council's Planning Proposal Report July 2022)

3 The Panel's Consideration

3.1 Future land uses

20. Potential flood-related risks associated with the Planning Proposal will, in part, depend on the possible future land uses occurring on the Site. The Panel notes the land use table for the IN1 (General Industrial) zoning in the *Byron Local Environment Plan 2014* (LEP), (now known as the E4 General Employment Zone), includes sensitive and potentially hazardous land uses that are permissible with consent, such as childcare centres, education facilities, respite centres, general industries, garden centres and agricultural produce industries. The Planning Proposal does not seek to limit any of these hazardous or sensitive land uses.
21. The Panel notes the submitted information does not include any assessment of the flood-related impacts of potential hazardous or sensitive land uses that would be permitted on the Site if it is rezoned.
22. However, the Panel notes clause 5.21 (Flood Planning) of the Byron LEP contains specific flood planning requirements for consent authorities to consider for future development applications lodged on the Site, including potential hazardous or sensitive land uses. Clause 5.21 (1(a)) requires the consent authority *'to minimise the flood risk to life and property associated with the use of land'*, and clause 5.21 (1(d)) seeks *'to enable the safe occupation and efficient evacuation of people in the event of a flood'*, amongst a range of flood-related provisions in the clause.

Proponents' comments

23. In its meeting with the Panel on 6 April 2023, the Proponent group presented additional information which was subsequently provided to the Panel via email on 13 April 2023. This information states it supports excluding the following sensitive and hazardous land uses from the planning proposal:
 - early education and care facilities,
 - educational establishments,
 - emergency services facilities,
 - respite day care centres,
 - sewerage systems.
24. The Proponent group also advised, *'there are no additional land uses that are being contemplated for future development beyond those specified in the land use table for the IN1 zone'* (Proponent information, 13 April 2023).

Council comments

25. In its meeting with the Panel on 3 April 2023, Council noted:
 - Under the employment zone reforms recently introduced across NSW (26 April 2023), industrial zones will be rationalised. As a result, there will be sensitive and hazardous land uses permissible with consent within the proposed industrial zoned land.
 - In response to the concern that rezoning part of the Site to IN1 (General Industrial) would result in some sensitive uses being permissible with consent, Council indicated that an alternative strategy, such as leaving this area zoned RU1 (Primary Production) and nominating additional permitted industrial uses on the Site, would not be appropriate. One reason given for this reluctance is the different objectives that apply to the RU1 and IN1 zones.

- Similarly, Council indicated it does not support prohibiting certain land uses within an individual IN1 lot, because that same prohibition would then apply to all land with the same zoning in the Byron LGA.
- Sensitive land uses are not expected by Council to eventuate on the Site; nonetheless in the event that a development application for such a use was lodged in the future, Council's merit-based assessment would factor this risk into its assessment.
- Council further advised it intends to adopt clause 5.22 (Special flood considerations), an optional provision of the *Standard Instrument - Principal Local Environmental*, into the Byron LEP, which would add further flood considerations for consent authorities in relation to future development applications over the Site.
- Given the small minimum lot size and character of surrounding existing industrial land, Council expect service industries or boutique food industries would occupy this land.

PLUS comments

26. In its meeting with the Panel on 9 March 2023, PLUS noted:

- It considers that specific land uses cannot be prohibited on an individual site through amendment to Part 6 (Additional Local Provisions) of the Byron LEP.
- Prohibiting a land use from the IN1 (General Industrial) zone would be required to be undertaken LGA wide, which would have a cumulative impact to other IN1 zoned land across the LGA.
- To this point, any land use sought to be prohibited from the IN1 (General Industrial) zone across the LGA is also prohibited in the E4 (General Industrial) zone, which came into effect on 26 April 2023).

Agency comments

27. In its advice to the Panel received 23 February 2023 the SES advised, in response to the Proponent's suggestion on 21 December 2022 to amend clause 6.4(3) of the Byron LEP to restrict sensitive uses from the Site (including early education facilities, educational establishments, respite day care centres and sewerage systems), that it agreed '*with this proposal to minimise the potential exposure of vulnerable members of the community to the flood risk at the site*' (p.3).

Panel consideration

28. The Panel has considered the flood risk to the Site and potential future uses that would be permitted under the proposed rezoning. In this regard, the Panel considers the Site is unsuitable for certain hazardous and sensitive land uses, which could result in environmental harm for hazardous uses or put vulnerable people in risk for sensitive uses.
29. The Panel acknowledges both Council and PLUS consider site specific amendments to prohibit certain land uses in the IN1 land use table in the Byron LEP, or to retain the RU1 zone and allow permissible additional uses on the site, are impractical as it would affect this zoning in the entire LEP or create potentially conflicting zone objectives.
30. The Panel notes PLUS does not consider specific amendments to Part 6 Additional Local Provisions (i.e. clause 6.4(3)) of the Byron LEP, for a specific location can be undertaken.
31. The Panel also notes that the *Standard Instrument (Local Environmental Plans) Amendment (Land Use Zones) Order 2021* lists mandated uses for the E4 zone that cannot be varied, including Garden Centres and General Industries.
32. The Panel recommends future land uses be carefully considered during the development application phase and note the existing clause 5.21 of the LEP offers critical guidance for future development consent authorities.

33. The Panel supports Council's intended adoption of the clause 5.22 (Special flood considerations) from the Standard Instrument into the Byron LEP. Clause 5.22 provides further important guidance to future development consent authorities regarding development applications for hazardous or sensitive land uses on land between the flood planning area and the probable maximum flood.

3.2 Flood Modelling

34. As part of the Planning Proposal, the Proponent commissioned the following documents regarding flood risk:
- Bangalow Industrial Estate Flood Impact Assessment (prepared by BMT, dated May 2021) (**Flood Impact Assessment**).
 - Letter re- Lot 150 – Bangalow Industrial Estate – Further Advice Re Flood Modelling (from BMT Principal Engineer D. Cavanagh, dated 30 June 2022) (**calibration letter**).
35. The Flood Impact Assessment investigates a larger fill area of approximately 1 ha, compared to the reduced fill area of approximately 0.76 ha. The Flood Impact Assessment provides modelling of a range of Annual Exceedance Probability (**AEP**) flood events including:
- 20% AEP (1 in 5 year): Water level at the Site peaks at 39.93 metres (m) Australian Height Datum (**AHD**).
 - 5% AEP (1 in 20 year): Water level at the Site peaks at 40.46 m AHD.
 - 1% AEP (1 in 100 year): Water level at the Site peaks at 40.98 m AHD.
 - 1% AEP + climate change: For a 10% increase in rainfall intensity scenario flood levels for 1% AEP increase by 0.1 m. For a 30% increase in rainfall intensity scenario flood levels for 1% AEP increase by 0.25 m.
36. The calibration letter indicates that the Flood Impact Assessment modelling has been calibrated for flood events occurring within the region in 2017 and 2020.
37. The Planning Proposal assumes the development footprint will be filled to the 1% AEP flood planning level of 40.98 m with the addition of 0.5 m freeboard resulting in a total fill height of 41.48 AHD. The Flood Impact Assessment assumes the proposed fill and additional freeboard will be sufficient to account for modelled climate impacts ranging between a rise in 1% AEP flood levels from 0.1-0.25 m.
38. In its letter to the Proponent dated 27 May 2022 and 12 July 2022, the Biodiversity Conservation Division (**BCD**) note that the February 2022 flood event which impacted the Northern Rivers Region should be used for model verification purposes, in addition to the March 2017 and February 2020 floods noted in the Proponent's calibration letter.

Proponent comments

39. In its meeting with the Panel on 6 April 2023, the Proponent group presented additional information which was subsequently provided to the Panel via email on 13 April 2023. In reference to the additional material provided, the Proponent advised that:
- the PMF had been modelled at 1.7 m higher than the 1% AEP flood event with a flood level of 42.7 m AHD and it would only last a few hours.
 - the Site is mostly inundated in a PMF with a maximum hazard rating of H4 (unsafe for vehicles and people).

- People on the site would be able to evacuate by foot to the adjoining existing industrial area (as it is located above the PMF) and would only need to shelter in place for a relatively short time.

Council comments

40. In its meeting with the Panel on 3 April 2023, Council noted:

- The Council engineers have undertaken an assessment of the Flood Impact Assessment and found it satisfactory.
- The Proponent had not calibrated the flood modelling against the latest flooding event in the region (the February 2022 Northern Rivers flood event).
- The proposal is adjacent to existing infrastructure and has been identified as potential industrial land in its strategic land use planning documents.

Agency comments

41. In its advice to the Panel dated 8 March 2023 **INSW** advised:

- The Proponent has provided a basic flood study considering flood impacts up to the 1% AEP flood event. The Planning Proposal needs to consider a range of flood events including the PMF and consider further flood hazard modelling (INSW, p1).
- Further information should be provided to understand the hazard rating of flood waters within the site up to the PMF (INSW, p4).
- Climate change sensitivity modelling undertaken as part of the Planning Proposal has indicated an increase of 0.1-0.25 m rise in flood levels on Site during a 1% AEP event. It is suggested that the Flood Planning Level for the Site is adjusted by the additional 0.25 m to accommodate modelled climate change impacts (INSW, p1).

42. In its advice to the Panel received 23 February 2023 the **SES** advised:

- The Flood Impact Assessment does not include an assessment of the risk at the Site up to the PMF. Further investigation into flood risk up to the PMF is recommended (SES, p2).
- In support of comments made in writing by the BCD on 27 May 2022 and 12 July 2022, the flood modelling provided requires re-calibration against the February 2022 Northern Regions flood event (see paragraph 22) (SES, p2).
- The proposed industrial land use is not likely to see a significant increase in people exposed to flooding as the occupants are likely to reside in other areas (SES, p2).

PLUS comments

43. In its meeting with the Panel on 9 March 2023, PLUS noted:

- The Site is identified as an investigation area for employment land/Industrial land in both state and council strategic plans.
- The Flood Impact Assessment does not provide information relating to:
 - PMF levels for the Site,
 - Evacuation,
 - Hazard levels for the Site,
 - Recalibration of data using the most recent February-March 2022 events,
 - Information regarding the operation/capacity of the existing culvert under Lismore Road.

TAG comments

44. *Flood Impact Assessment:*

- The TAG members noted the submitted Flood Impact Assessment models the 1%, 5%, and 20% AEP. However, a range of flood events above the 1% AEP have not been considered including the 0.02% and the PMF.
- The TAG agreed the Flood Impact Assessment should be updated to model a more extensive range of flood events including the 0.02% AEP and PMF flood events in line with the recommendations of the Flood Inquiry.

45. *Climate Change:*

- TAG members advised climate change will increase flood risk in the region and identify that further assessment is required in relation to climate change impacts.
- TAG members noted the Flood Impact Assessment includes a sensitivity analysis using 10% and 30% increase in rainfall intensity for the AEPs.
- The TAG noted that climate change will increase the 1% AEP flood event by 0.25 m at the Site, and 0.2 m and 0.5 m in the vicinity of the Site. The TAG considers that it is not best practice for additional levels to be accounted for in the freeboard as proposed through the Flood Impact Assessment.

46. *Cumulative Hydraulic Impacts:*

- From a hydraulic perspective, the TAG advises the development does not appear to significantly influence upstream and downstream flood impacts when the flood originates from Byron Creek.
- However, the TAG noted hydraulic impacts from a Maori Creek flood are less clear and have not been appropriately modelled.

47. *Flood Hazard:*

- The TAG recommended that further information is required to assess flood hazard for the full range of flood events and to identify risk to life and property.
- The TAG agreed that up to date hazard maps for the Site should be provided to assist in quantifying risk to life. Hazard maps for events above the 1% AEP should be provided and further consideration given to Maori Creek-only events.
- According to the TAG the Site does not appear to be in a flood conveyance area for Byron Creek. However, it may potentially be located within the 1% flood delineation from Maori Creek. The TAG recommends building controls be imposed to mitigate any potential impacts from debris and chemical/biological contamination.
- TAG members identify that the Site is likely to experience flash flooding, and that there is no flood warning system currently in place for the Site.

Panel considerations

48. The Panel acknowledges the Flood Impact Assessment has not modelled the range of scenarios recommended by the Flood Inquiry and by the TAG. The Panel also notes that both Council and the Proponent consider the modelling undertaken is commensurate with the risk posed by the Planning Proposal, given the site's relatively small size, small development yield and that the Site would be rarely occupied 24 hours a day.
49. The Panel considers it would be helpful for the additional recommended modelling to have been undertaken to provide a greater understanding of the range of risk and flood impacts from the Planning Proposal.

50. Notwithstanding, the Panel acknowledges the Proponent provided new information on 13 April 2023 detailing the PMF flood levels, PMF hazard mapping and hydrograph for the proposal. In particular the hydrograph indicates flood duration times would be a matter of hours further reducing the flood risk for the site.
51. Consequently, the Panel broadly agrees with Council and the Proponent that the Planning Proposal likely poses a relatively lower flood risk due to the nature of the proposed rezoning. Also the Panel considers that the recommended additional modelling can be provided at the development application stage.

3.3 Evacuation

Proponent comments

52. The Proponent did not provide site specific evacuation modelling.
53. At its meeting with the Panel on 6 April 2023, the Proponent group presented additional information which was subsequently provided to the Panel via email on 13 April 2023. In reference to the additional material provided, the Proponent group noted the following:
- According to the Local Flood Plan there are no flood evacuation routes or flood evacuation centres nominated for the Bangalow area. To date there has not been a Council adopted flood risk plan.
 - Time to peak flow for the Site during 1% AEP and PMF events is likely to be approximately three hours. Waters will recede under most flood events relatively quickly in a manner of hours.
 - The primary evacuation route is only 150 m to an area above the PMF and can be driven or walked with ease under flood conditions.
54. The Panel understands the Proponent's view, as outlined at the meeting on 6 April 2023, is that during extreme flood events the Site is unlikely to be occupied because most people would remain at home. In the event of an extreme flood event, any occupants who are present at the Site have sufficient time to evacuate safely to the existing Industrial area to the south of the Site until flood waters recede.

Council comments

55. At its meeting with the Panel on 3 April 2023, Council provided comments consistent with the Proponent's views, including:
- The industrial land use provides an advantage regarding flood evacuation in comparison to residential land, due to overnight vacancy and low overall occupancy compared to residential land.
 - The adjoining industrial land is on higher ground and can easily accommodate people needing to walk to high ground.
 - Mapping shows evacuation is potentially available by Dudgeons Lane, although this is currently an unformed, paper road.

Agency comments

56. In its advice to the Panel dated 21 March 2023, **TfNSW** advised:
- The State Road is open during a flood event to allow site occupants to evacuate (TfNSW, p1).
57. In its advice to the Panel dated 8 March 2023, **INSW** advised:

- No details regarding evacuation or modelling of evacuation routes have been provided. The proponent should undertake further evacuation modelling to demonstrate road capacity, timely evacuation under relevant warning times, and rising egress of local roads (INSW, p1).

58. In its advice to the Panel received 23 February 2023 the **SES** advised:

- From the available flood information, the Site becomes isolated from Bangalow once Lismore Road floods at Maori Creek at around the 5% AEP flood event. It appears the Site is a potential low flood island surrounded by a rural area with no essential or support services (SES, p2).
- While further information is required to effectively understand evacuation constraints, it is noted that there are no formal warning systems for Maori Creek, and the Site is subject to flash flooding.
- Shelter in place is not endorsed as a flood management strategy appropriate for this Site (SES, p3).
- Site specific emergency plans should not be used to manage the potential risk to life as a result of the proposed development (SES, p4).
- Noting that the Site is potentially prone to isolation, further investigation is required to understand the residual risk regarding evacuation compliance that will be transferred to SES as a result of the proposed development (SES, p6).

PLUS comments

59. In its meeting with the Panel on 9 March 2023, PLUS noted

- Evacuation modelling had not been undertaken by the Proponent.
- There is no flood free evacuation route to Bangalow as the Flood Impact Assessment shows Lismore Road is affected by the 1% AEP. The alternative option nominated by Council, from Dudgeons Lane to Friday Hut Road, does not appear to be formed.

TAG comments

60. *Evacuation Modelling:*

- The TAG formed the view that the Proponent had provided insufficient information to assess the full extent of the risk to safe evacuation and risk of potential isolation.

61. *Site-specific Warning System:*

- The TAG noted there is no flood warning system for the Site. Occupants would be reliant on taking appropriate actions in response to the available public services and notifications.

Panel considerations

62. From its Site visit, the Panel observed that Dudgeons Lane is unformed through to Friday Hut Road and cannot be used for a secondary evacuation route.

63. The Panel agrees with the Proponent and Council's comments that there is likely to be comparatively low occupancy of the Site, and during an extreme flood event occupants would be able to move to ground above the PMF safely until flood waters recede. This view was further supported by the Proponent's information dated 13 April 2023, detailing the Site would only be inundated for a few hours during a PMF. The Panel notes this duration is shorter for more frequent flooding events.

3.4 Mitigation

64. The Proponent's Flood Impact Assessment modelled two fill scenarios of approximately 1 ha and 1.03 ha to the 1% AEP. This predicted that the offsite impacts do not exceed +/- 0.01 m and *'the likelihood of any substantive risk of contribution to cumulative impact is considered unlikely'* (p. 23).
65. Following the exhibition of the Planning Proposal there were a number of changes including reducing the extent of the IN1 (General Industrial) zoning and increasing the C3 (Environmental Management) zoning to provide a greater buffer to Maori Creek. Consequently, the area being filled has reduced from approximately 1 ha to 0.76 ha.

Proponent comments

66. At its meeting with the Panel on 6 April 2023 the Proponent group presented additional information which was subsequently provided to the Panel via email on 13 April 2023. In reference to the additional material provided, the Proponent group noted the following:
- While it has not been considered in the Planning Proposal to date, in principle the future DAs could accommodate the storage of hazardous material above the PMF in line with the recommendations of the Flood Inquiry.
 - Further work has been done to understand the PMF event, with the preliminary mapping showing the PMF is 1.7 m higher than the 1% AEP and the majority of the Site flood hazard level is H4.
 - The Proponent indicated additional fill could be provided if appropriate for individual developments on the Site.

Council comments

67. At its meeting with the Panel on 3 April 2023, Council did not raise any concerns with the prospect of filling the Site to the 1% AEP level, noting the introduction of fill to ensure the proposed industrial land is above the 1% AEP is in accordance with current NSW Government and Council flood policy guidance.
68. Council further noted the proposed fill extent had been reduced due to the decreased area of the IN1 (General Industrial) zoning, and is further away from Maori Creek, with the C3 (Environmental Management) zone buffer now a minimum of 40 m and increasing to 70 m at the southern portion of the lot.
69. Council also noted its engineers had reviewed the proposed fill strategy and did not raise any concerns about the introduction of fill to the Site, or any offsite impacts. Council noted the Proponent's Flood Impact Assessment considered different scenarios of fill impacts and concluded there will be negligible offsite impacts.

Agency comments

70. In its advice to the Panel dated 8 March 2023, **INSW** advised:
- Further modelling should be undertaken to quantify the impact of additional fill in the floodplain as a result of the proposed industrial rezoning (INSW, p1).
71. In its advice to the Panel received 23 February 2023 the **SES** advised:
- Noting there is no compensatory cut associated with the fill strategy proposed by the Proponent, the assessment does not adequately address the cumulative impact of the fill strategy (SES, p4).

PLUS comments

72. At its meeting with the Panel on 9 March 2023, PLUS noted:

- Recommendation 20 of the Flood Inquiry states watercourses should flow naturally rather than implementing engineered barriers such as flood levees and mitigation schemes to stop floods.

TAG comments

73. *Fill to Raise Building Pads:*

- The TAG noted the primary proposed mitigation measure taken to avoid flood impacts on the Site is the use of fill to raise the ground levels above the 1% AEP flood level.
- The TAG noted the proposed fill approach is inconsistent with Recommendation 20 of the Flood Inquiry, which recommends against barriers that influence or stop the flow of water.
- However, the TAG noted, subject to further modelling and assessment, there are potential building controls that could mitigate the flood risks.

74. *Additional Mitigation Measures:*

- The TAG noted the Flood Impact Assessment contains limited information on other mitigation measures in response to flood risk for the Planning Proposal.

75. *Economic Impact*

- The TAG noted that no economic impact modelling has been included within the materials submitted for the Planning Proposal. The TAG noted both direct and indirect economic damage would likely occur. Also, offsite impacts could occur if hazardous materials are stored on site.

Panel considerations

76. While the Panel acknowledges the proposed fill strategy may not strictly align with the recommendations from the Flood Inquiry, it notes that offsite impacts have been modelled and are predicted to be within +/- 0.01 m range.
77. The Panel considers in this instance the fill strategy has merit, given the overall fill has been reduced by 25% from what was modelled in the Flood Impact Assessment and the small scale of this proposal.
78. The Panel considers additional fill may be required to account for climate change, potential hazardous or sensitive land uses and this needs careful consideration by any future development consent authority.

4 The Panel's Advice

79. The Panel has undertaken a review of the Planning Proposal as requested by PLUS (see Section 1.1). In doing so, the Panel has considered the Material (see section 1.2 above) including submissions by the Proponent, Council, the TAG, SES, INSW, TfNSW and PLUS.
80. The Panel acknowledges the strategic context of the Planning Proposal in providing additional industrial lands for the Byron Shire and understands from PLUS and Council the expansion of industrial land in this area has been identified in strategic planning documents for some time.
81. Given the Site's location near Maori Creek, the Panel is mindful that flooding is not a new matter and is a risk that has been factored into deliberations, strategic planning and decision making to this point.
82. In this regard, the Panel advises that flood-related matters should not prevent this Planning Proposal from being finalised. Material before the Panel indicates that evacuation measures and mitigation impacts, including the use of fill, are satisfactory, flood durations are likely to be short, the level of flood hazard is acceptable, and risks minimal given the probable future land use of the Site. Remaining gaps that exist in flood modelling and impacts can be resolved at the development application stage. These factors, plus the local controls that Council has in its LEP, should ensure a tolerable and manageable risk-weighted outcome to the development of this Site from a flood planning perspective. Specific advice relating to the Planning Proposal and potential future development applications are further outlined below.

Planning Proposal

83. Regarding the Planning Proposal, the Panel advises:
- The area of the Planning Proposal is small, being 0.76 ha with a minimum lot sizes of 1,000 m² (0.1 ha) which would allow a maximum of seven lots.
 - The overall flood risk is relatively low, given:
 - The site would likely be occupied during daytime hours only and by relatively few people,
 - The flood duration times are short and would be a matter of hours for a PMF event,
 - Evacuation out of PMF flood water is a short walk (150 m) to the nearby industrial estate,
 - The proposed fill area of 0.76 ha is a small size and the Flood Impact Assessment predicts it would have limited impact on flood displacement.
 - Consequently, the Panel considers the project is a logical extension of the existing industrial area and can proceed subject to appropriate consideration of individual applications by the relevant development consent authority.

Future Development Applications

84. Regarding future development applications on the Site, the Panel advises:
- Flood and evacuation modelling for a range of scenarios between the 1% AEP and the PMF, including consideration of data from recent flood events and climate change factors, should be undertaken as recommended by the Flood Inquiry and the TAG.

- The consent authority should consider the appropriateness of sensitive and potentially hazardous land uses having regard to the site specific characteristics identified in the flood modelling. The Panel advises that should such uses be proposed in future development applications, careful consideration needs to be given to building construction materials and method, flood resilience and safe evacuation measures.
- Clause 5.21 (Flood Planning) of the Byron LEP must be considered by both future applicants and the consent authority to ensure that flood-related matters are adequately dealt with at the development application stage.
- The Panel supports Council's intended adoption of clause. 5.22 (Special flood considerations) of the Standard Instrument LEP into the Byron LEP as this would further assist the assessment of future development applications.



Felicity Greenway (Chair)
Member of the Panel



Dr Peter Williams
Member of the Panel



Juliet Grant
Member of the Panel

Appendix A – Material Considered by the Panel

Attachment ID / Date	Name	Author
20.05.2022	26.2021.3.1 Appendix A - Flood Impact Assessment PP-2021-3615	BMT
30.06.2022	26.2021.3.1 Further information on flood modelling calibration	BMT
9.01.2023	DOC22 1143084 Referral Letter to Flood Advisory Panel - Bangalow	PLUS
6.2022	DOC22 1143090 Attachment A1 Planning Proposal	Council
13.10.2021	DOC22 1143093 Attachment A2 Gateway determination	Department
1.06.2022	DOC22 1143095 Attachment A3 Alteration of Gateway determination	Department
20.05.2021	DOC22 1143096 Attachment A4 Flood Impact Assessment	BMT
27.05.2022	DOC22 1143097 Attachment A5 Response from Division of Biodiversity and Conservation 27-05-22	Department
12.07.2022	DOC22 1143099 Attachment A6 Response from Division of Biodiversity and Conservation 12-07-22	Department
25.08.2022	DOC22 1143102 Attachment A7 Council response to questions from the Department for finalisation	Council
25.08.2022	DOC22 1143105 Attachment A8 Council report 25-08-22	Council
21.12.2022	PP-2021-3615 - 150 Lismore Road Bangalow	Proponent
21.03.2023	TfNSW Advice	TfNSW
23.02.2023	SES Advice	SES
08.03.2023	INSW Advice	INSW
Proponent IN (13.04.2023)	Amended BRS Powerpoint to FAP	Proponent
Proponent IN (13.04.2023)	Bang_Ind_Estate_BMT_Flood	Proponent