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19/02/2024

For the Attention of: Rafael Bautista
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FURTHER DETAILS:

RE: ***FLOOD EMERGENCY EGRESS (Dido Street Kiama):***
It is understood that Kiama Council rely on an interpretation of the EP&A Act for this site that has resulted in the following reasons for refusal.

(cont)

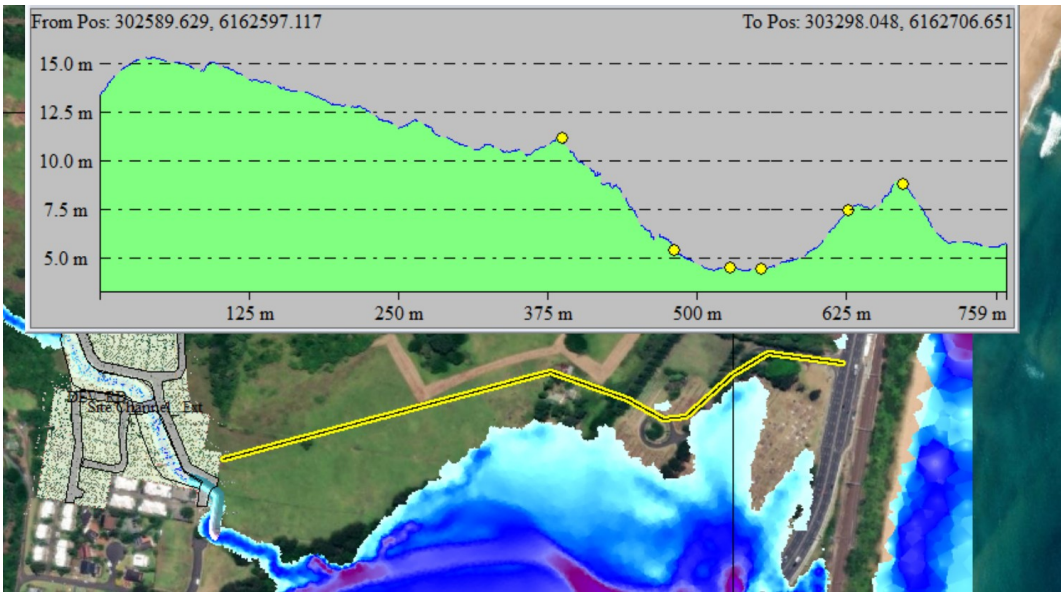
1. The lack of flood free access/egress in the event of an emergency evacuation from the development during a defined flood is unacceptable having regard to the EP&A Act S.4.15(1)(b) – social and economic impacts in the locality, and S.4.15(1)(c) the suitability of the site for the development.
2. Pursuant to the EP&A Act S.4.15(1)(a)(iii) the provision of any Development Control Plan, the proposal does not provide flood free access/egress as required pursuant to Kiama Development Control Plan objective O:3.6.44 – Property Access
3. Pursuant to EP&A Act S.7.4 Planning agreements, the proposed Planning Agreement to fund a flood free access study is considered inadequate to address the critical issue of flood free access/egress.
4. Pursuant the EP&A Act S.4.15(1) (d) and (e) The proposal is considered unsatisfactory having regard to having regard to issues raised in submissions, and the public interest.
5. Pursuant to the EP&A Act S.4.15(1)(a)(i) the provision of any environmental planning instrument, the proposal does not satisfactorily demonstrate how protection and maintenance of terrestrial biodiversity will be achieved having regard to Clause 6.4 Terrestrial biodiversity of Kiama LEP 2011.
6. The development requires an Asset Protection Zone over neighbouring land Lot 3 DP805229 with owners consent not obtained for this as required pursuant to cl.23 of the Environmental Planning and Assessment Regulation 2021.
7. The proposal involving 67 Torrens title residential lots and one Community lot does not satisfactorily demonstrate binding arrangements for the maintenance of the Community lot drainage, roads and park, pursuant to the *Community Land Development Act 2021* clause 8 Establishment of community scheme.

Item 15.1

This report aims to identify that withholding consent for this development may be considered unreasonable given the information contained herein.

0.0 EXECUTIVE SUMMARY:

The statement that there is no flood free access to this proposed development site, is strictly speaking, incorrect. The implied requirement for vehicular access imposes this outcome only. In an emergency situation there is flood free (walking, or carrying a stretcher) access available to the nearest house on Riddell Street 375m away. From this point an awaiting ambulance in the adjoining cemetery (100m further) has access to the roadway network. Indeed the railway station is accessible on foot.



Nearest flood free evacuation on foot 375m to adjoining house 760m to the highway.

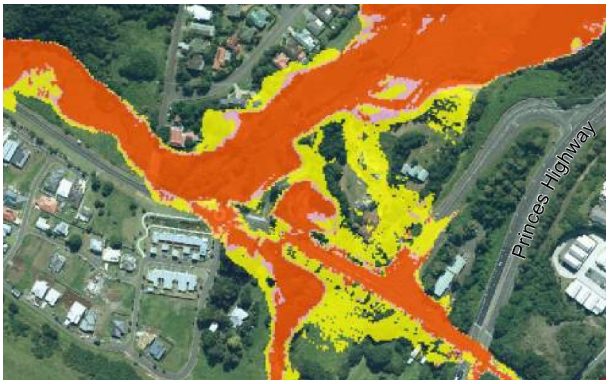
It is concluded that the proposed development site is completely Flood Free to the PMF event. No evacuation is normally necessary. Evacuation is available on foot not encumbered by any flooding. It is possible to reach the main Highway and Railway Station in a 10-12minute walk. The nearest other house is around 5 minute walk from the site. Vehicular egress is limited for a duration of 1.95 hours (117 minutes) in the “Defined Flood” event. The defined flood from the latest ARR 2019 procedures identifies the median as the **1% 120 Minute with Pattern 4.** The catchment size and response is determined to result in “Flash Flooding”. On this basis all available guidelines suggest that “Shelter in Place” is the best Floodplain management strategy to ensure the safety of the community. It is highly likely that the NSW Land and Environment Court would approve this development with conditions on the basis of available precedent. On face value it appears that Kiama Council has not been very consistent in how it deals with development proposals that are impacted by Flood water.
It is strongly recommended that Kiama Council take into consideration the facts presented in this report that highlights that Shelter-In-Place is the preferred and recommended strategy for this development to manage flood risk. It has to be recognised that Evacuation is possible on foot, with

a 10-12minute walk to the Railway Station at Bombo. It is recommended that approval for this proposed development not by upheld on any grounds related to Flooding.

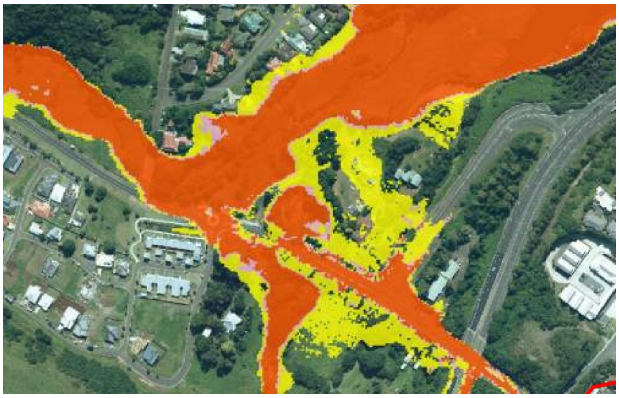
1.0 BACKGROUND:

It should be noted that the current Kiama Council Spring Creek Flood Study is dated May 2014. Hence it pre-dates very significant changes to ARR procedures (2016 & 2019). This includes new IFD data, new procedure regarding application of 10 patterns per (24) durations for all (18) frequencies. Hence in total 10x24x18 = 4320 events are available for analysis. Aerial Reduction Factors methods have also changed. The most significant change is the move to the Critical Flood being the “Median” as derived from the 10 patterns.

Hazard has been identified in the 2014 Council Study for the site in Dido Street for the 1% and 5% events as presented in the study (extracts below). It should be noted no further detail regarding timing of hazard or duration is available. This is as required by the NSW Floodplain Management Protocols and recommendations.



5% Flood Hazard 2014 Study



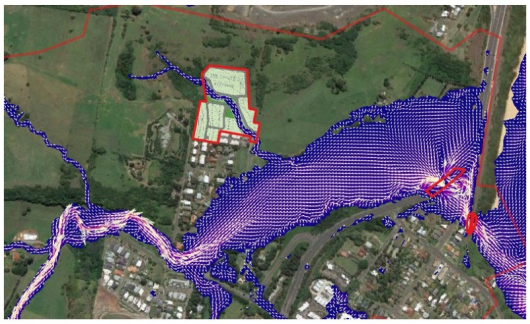
1% Flood Hazard 2014 Study

As identified in previous reports for this site, the peak flood level for the downstream control of the site is resulting from a 90 minute Pattern 5 event (Wetland Bypass) {Page 34 of original report dated 20/01/2023}. Flooding for the site has fully accounted for the highest flood level downstream. The developed site is flood free, no new residential lots are impacted by flooding. The site is not isolated, except by access with motor vehicles.

However, not withstanding councils’ previous multiple approved developments adjoining the site (on the north side of the Dido St. culvert) this proposal has been determined to be excessive in its social and economic impact. This position is questioned given the evidence provided in the request for further information addressed in detail in document dated 19/10/2023.

FINAL** Glenbrook Drive Kiama, SubDivision Estimated Flood Levels, January 20, 2023

Glenbrook Drive Sub-Division
Kiama,
Estimated Flood Levels:



DOCUMENT HISTORY:			
Date	Version	Detail	Comment
13/07/2021	Draft 01	1st Version 2011,2018 LIDAR + Site Survey	ARR 1987& 2016
19/12/2021	Draft 02	2nd Version of Draft Existing Case Only (New Lot Layout)	ARR 1987& 2016
05/12/2022	Draft 03	3rdVersion of Draft Existing & DEV. Case	ARR 1987& 2016
21/12/2022	Draft 04	4thVersion of Draft Existing & DEV. Case	ARR 1987& 2016
11/01/2023	FINAL	5th and final version Existing & DEV. Case	To Seek Approval
17/01/2023	FINAL*	6th and final version Existing & DEV. Case	To Seek Approval
20/01/2023	FINAL**	7th and final version Existing & DEV. Case	To Seek Approval

* The Final Report was amended to include statements relating to the inflow of minor tributary flows through the site from the north, particularly north east. The drainage system including road reserve overflow capacity contain all flows to the PMF.

** Reference to further incomplete study removed

Commercial in Confidence *19/10/2023*

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19/10/2023

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AS REQUESTED:

RE: COUNCIL REQUEST FOR FURTHER DETAILS (Updated) Ver. B:
Note the initial response is dated 26/08/2023. Further details have been requested for section c (pg 9) & e (pg 21-23), now included.
It is understood that Kiama Council has now reviewed the Flood Assessment undertaken for this site dated 20-01-2023. The following has been advised as requiring further details as requested:

Flooding

The following comments are provided regarding the flooding and must be addressed;

a) Provide ascii or similar output files for pre and post flood modelling results including;
   - i PMF levels, depth & velocity
   - ii 1% AEP levels, depth & velocity
   - iii provisional hazard categories
   - iv provisional hydraulic categories
   - v pre/post adopted roughness

b) Overflow from lower bridge during PMF event (9.3m AHD) would seem to be above the deck level and flow down the road based on the road levels shown in the section (Sheet 62). Further notation of 'station' location is required for clarification

c) Station/chainage not shown on plan view for comparison of levels (Sheet 64)

Re: COUNCIL REQUEST FOR FURTHER DETAILS (Updated) Ver. B *Page 1 of 28*

Original Report

Further details provided

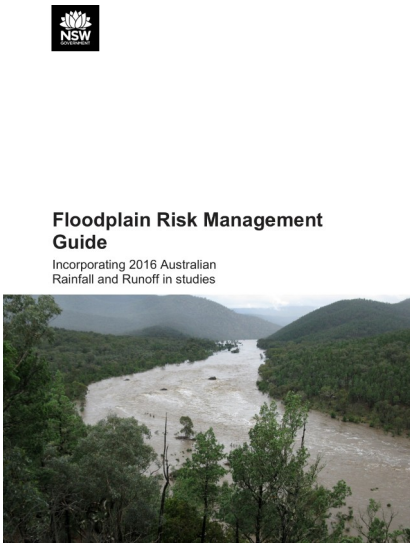
1.1. BACKGROUND IN FLOOD GUIDELINES:

The original intent and detail in the 1986 Floodplain Development Manual (which focused on advising on flooding related to development) has systematically been made more complex and has become dispersed in now numerous documents. There is no definitive simple guide. It has become a complex mine field, not really addressing well, any of the basic requirements.

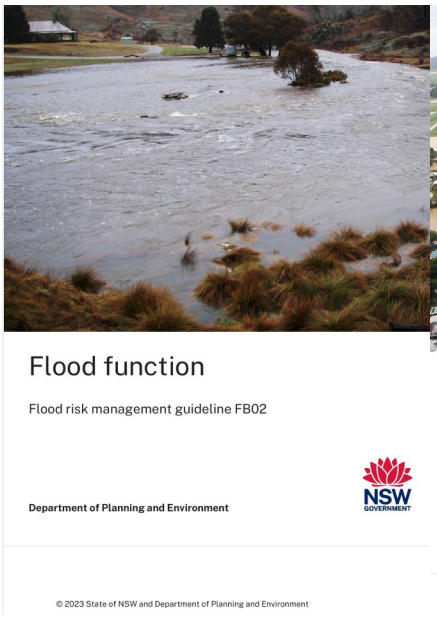
The latest 2023 Floodplain Manual does not provide the same level of guidance. Instead it relies on a multitude of other publications recently produced by NSW and other older documents. The issue of hazard is dealt with, by a specific document "Flood Hazard" FB03 2023 although it is noted that duration is not dealt with in this publication.

2023 (67 pgs)

2023 FB01 (71 pgs)



2019 (79 pgs)

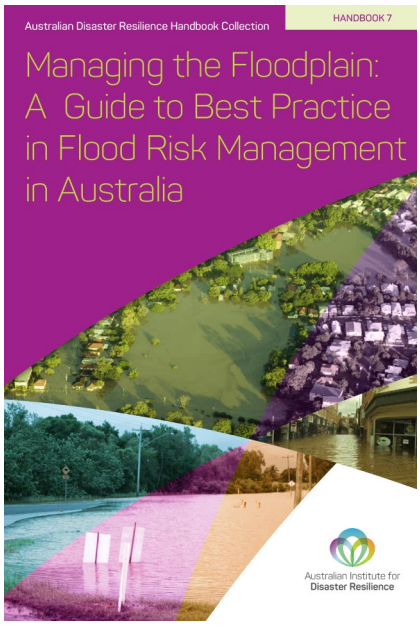


2023 FB02 (33 pgs)

2023 FB03 (13 pgs)

2023 LU01 (30pgs)

Other related publications now relied on by the above publications include:



2017 ADR 7 (110 pgs)

2017 ADR 7.5 (60 pgs)

2017 ADR 7-6 (36 pgs)

With around 500 pages in these documents and their reliance on even older documents such as SCARM-73 (2000) and the original research from the 1970's, it is disappointing that an industry in the flood space has not evolved concepts around hazard to account for time of hazard more specifically. It is noted time of hazard was specifically discarded by NFRAG in 2014.

1.2. DETERMINATION OF HAZARD:

One key outcome of all flood studies is to provide HAZARD MAPS. These map out the hazard within a catchment. The actual definition of hazard has changed very little since the early 1970's. Currently we have a new set of labels for pretty much the same hazard limits, with refinement in the definition from H1 – H6.

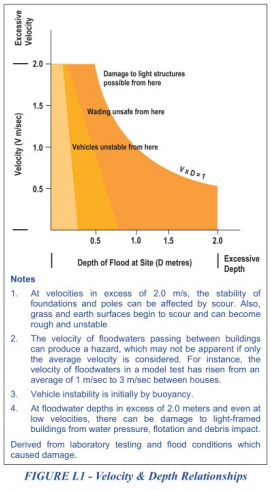


FIGURE L1 - Velocity & Depth Relationships

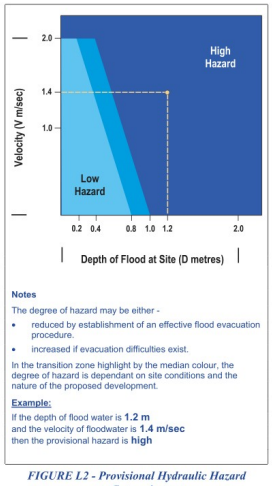


FIGURE L2 - Provisional Hydraulic Hazard Categories

1986 FPDM

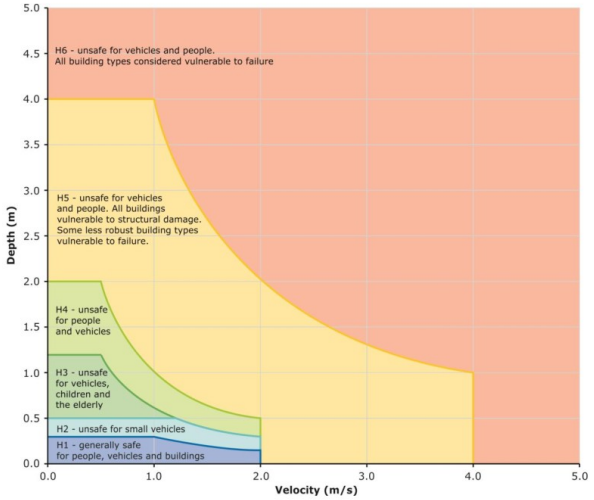


Figure 5-5: Combined flood hazard curves

H1-H6 2023 Guidance

Over 37 years HAZARD definition has changed minimally; the 1986 VxD = 1.0 is the 2023 H4 limit with some key numbers changing slightly. For example the key hazard of 0.4 in 1986 seems to have moved toward 0.6 in 2023.

Table 4-2: Proposed draft interim criteria for stationary vehicle stability (After Shand *et al.*, 2011)

Class of Vehicle	Length (m)	Kerb Weight (kg)	Ground clearance (m)	Limiting still water depth[1]	Limiting high velocity flow depth[2]	Limiting velocity[3]	Equation of stability
Small passenger	< 4.3	< 1250	< 0.12	0.3	0.1	3.0	D.V ≤ 0.3
Large passenger	> 4.3	> 1250	> 0.12	0.4	0.15	3.0	D.V ≤ 0.45
Large 4WD	> 4.5	> 2000	> 0.22	0.5	0.2	3.0	D.V ≤ 0.6

[1] At velocity = 0 m/s; [2] At velocity = 3 m/s; [3] At low depth

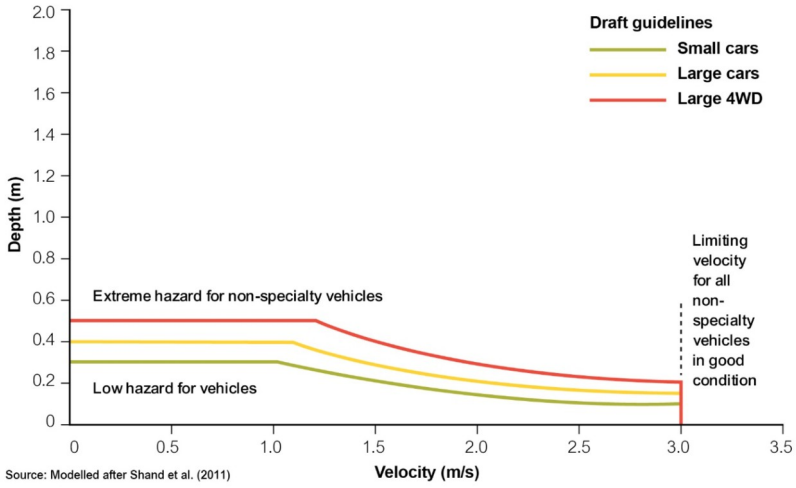


Figure 3 Thresholds for vehicle stability in floods
Source: Figure 9 AIDR 2017b; modelled after Shand et al. (2011).

HAZARD Limits for Vehicles

It should be noted that most emergency vehicles would be considered as between a Large Car and a Large 4WD (VxD = 0.6m2/s).

Table 4-1: Flow hazard regimes for infants, children and adults (After Cox *et al.*, 2010)

D x V (m^2s^{-1})[1]	Children[2] (H.M = 25 to 50)	Adults (H.M > 50)
0	Safe	Safe
0 – 0.4	Low Hazard[1]	Low Hazard[1]
0.4 – 0.6	Significant Hazard; Dangerous to most	
0.6 – 0.8	Extreme Hazard; Dangerous to all	Moderate Hazard; Dangerous to some[3]
0.8 – 1.2		Significant Hazard; Dangerous to most[4]
> 1.2		Extreme Hazard; Dangerous to all

Notes:

1. **Maximum depth stability limit of 1.2m for adults and 0.5m for children** under good conditions. **Maximum velocity stability limit of 3.0 ms^{-1}** for both adults and children.
2. More vulnerable community members such as infants and the elderly should avoid exposure to floodwater. Flood flows are considered extremely hazardous to these community members under all conditions.
3. Working limit for trained safety workers or experienced and well equipped persons (D x V < 0.8 m^2s^{-1})
4. Upper limit of stability observed during most investigations (D x V > 1.2 m^2s^{-1})

Source: (Smith, Davey and Cox; 2014) Limit for Adults VxD = 0.6m2/s

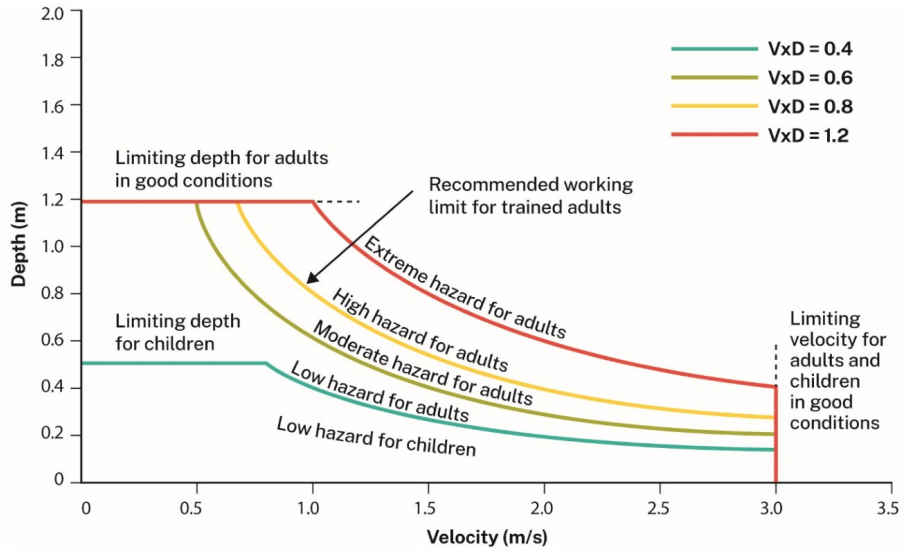


Figure 2 Thresholds for the stability of people in floods

Notes: D.V = VxD = velocity x depth.

Source: Figure 8 AIDR 2017b; modelled after Cox, Shand and Blacka (2010).

From 2023 FB03; Limit for Adults VxD = 0.6m2/s

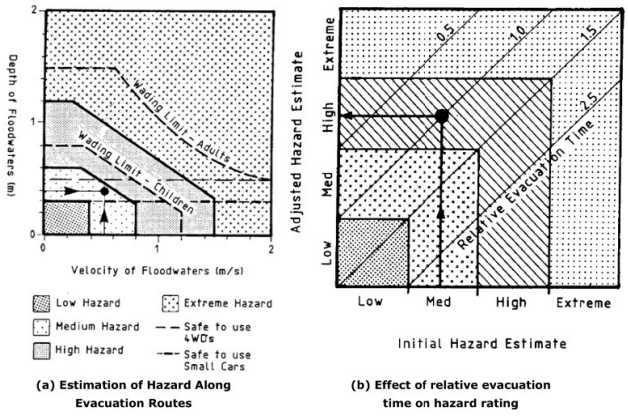
From the latest Hazard indicators V = 1.2 x D = 0.5, (VxD = 0.6) seems a key indicator

Table 5-2 Combined hazard curves – vulnerability thresholds classification limits

Hazard Vulnerability Classification	Classification Limit (D and V in combination)	Limiting Still Water Depth (D)	Limiting Velocity (V)
H1	D*V ≤ 0.3	0.3	2.0
H2	D*V ≤ 0.6	0.5	2.0
H3	D*V ≤ 0.6	1.2	2.0
H4	D*V ≤ 1.0	2.0	2.0
H5	D*V ≤ 4.0	4.0	4.0
H6	D*V > 4.0	-	-

Latest Version of HAZARD Curves H2-H3 limited by VxD= 0.6, H4 by VxD = 1.0

It is noted that in the latest hazard research used in Australian Floodplain Management (Smith etal 2014) timing was not considered an issue that was supported. Hence it is not suggested or recommended in the NSW Floodplain Management Program.



(a) Estimation of Hazard Along Evacuation Routes

(b) Effect of relative evacuation time on hazard rating

Figure 2-2: Hazard Graphs (Source: SCARM, 2000)

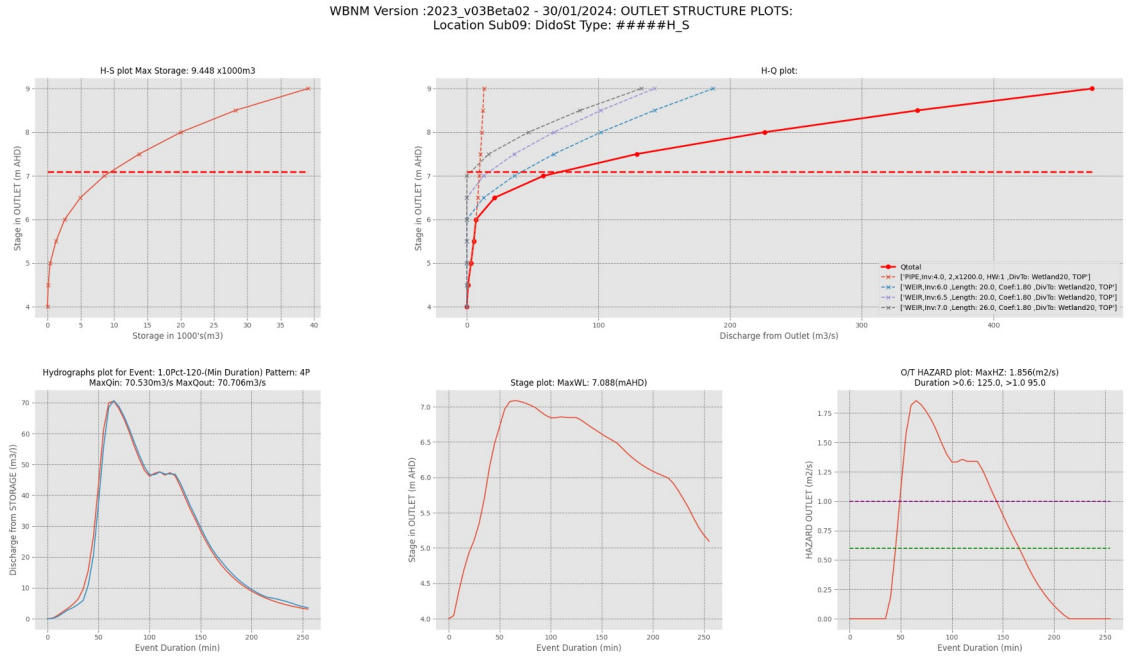
The timing aspects of flood hazard interpretation were discussed at length at the NFRAG Committee meeting of 13 and 14 March, 2014. This discussion concluded that ***national floodplain representatives were not in favour*** *of an integrated flood hazard parameter quantification combining flood depth, flow velocity and* ***flood timing.*** *In a similar conclusion, WRL Technical Report 2014/07 FINAL September 2014 modifying of the flood hazard classification using a timing parameter similar to the figure in SCARM Report 73 Section J.3 (reproduced in this report as Figure 2-2) was also* ***not supported by the NFRAG*** *Committee.*

(Smith etal 2014) & (SCARM 2000)

Therefore in order to identify the extent of isolation encountered the current measure is the time for which the hazard is at or above 0.6m2/s in the “Defined Flood”.

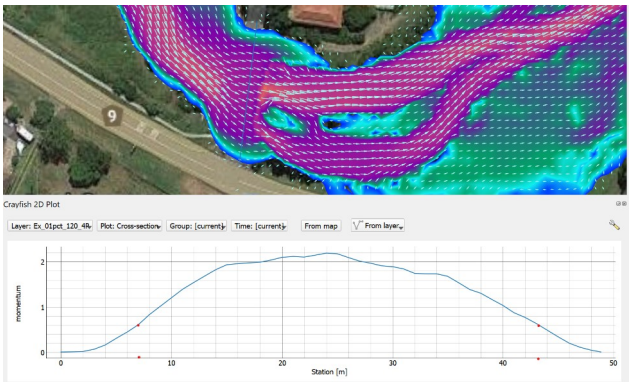
2.0 THE DEFINED FLOOD EVENT DIDO STREET:

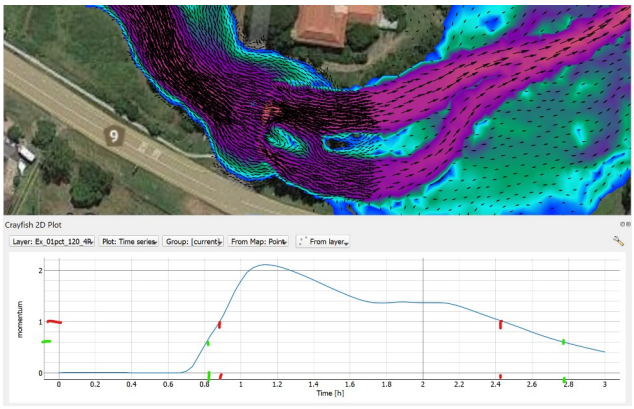
The defined flood from the latest ARR 2019 procedures identifies the median as the **1% 120 Minute with Pattern 4.** The performance of the culvert in the hydrologic model is as follows:



Hydrologic model Estimate of 1% Hazard Max 1.9m2/s; Duration: @ 0.6, 125min, @ 1.0, 95min

Note the Hydrologic model has an implicit assumption that there is no significant back water. This is likely the case for most events at Dido Street, so the estimate is likely reasonable. However notwithstanding this, the same flood event has been run in a full 2D hydraulic model to confirm in more detail the performance and accounting for any back water if present. The hydraulic model confirms the hydrologic model results with further details of the variation of hazard across the segment of flood roadway. Note the time series of hazard is very similar to that derived from the hydrologic model.

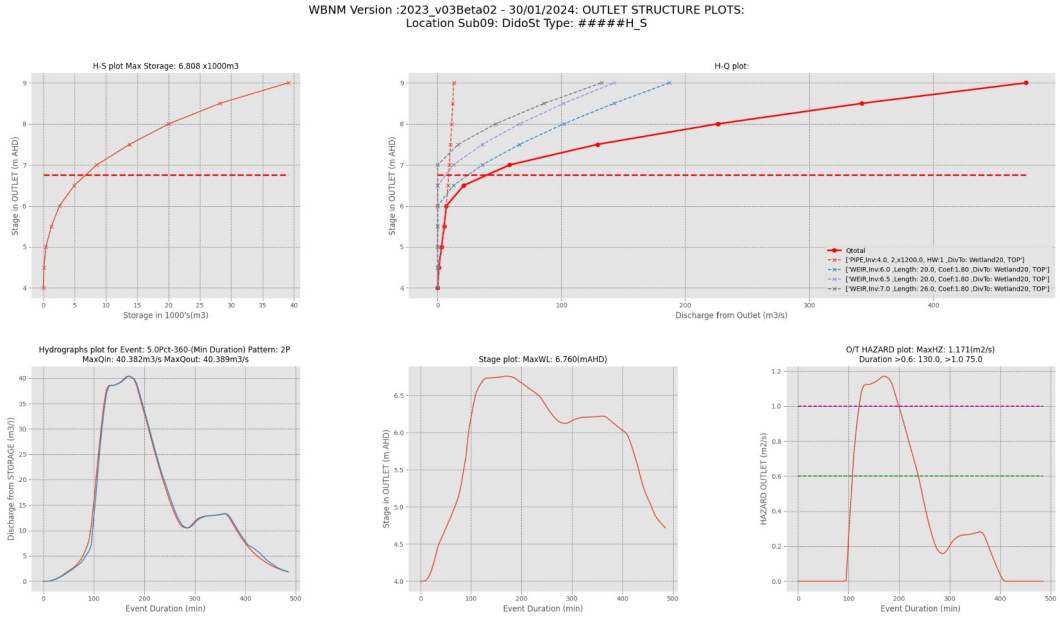




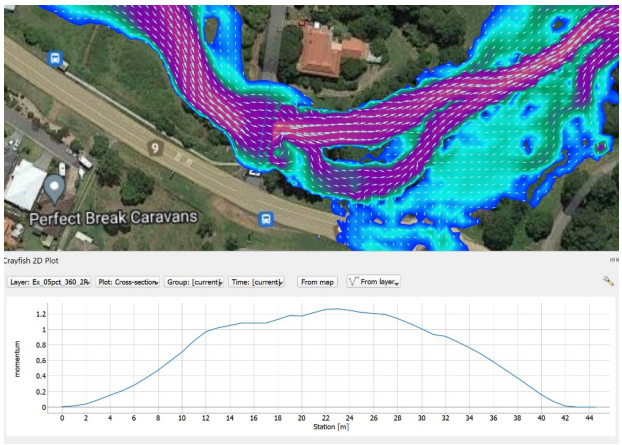
The worst Hazard Condition exists 70Minutes into the 120 minute Defined Event @ 2.2m2/s

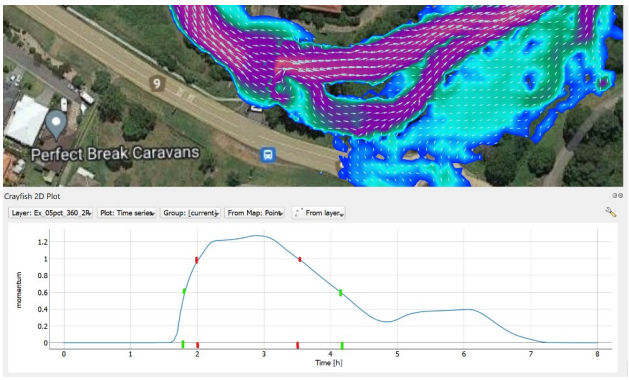
Duration: 1% Haz @ 0.6, 1.95hrs (117min),@ 1.0, 1.5hrs (90min).

On the basis that the hydrologic model estimate in the 1% is very close to the hydraulic model results. The 5% event results can be relied on as an accurate estimate. The hydrologic has determined the Median event to be the **5% 360 minute Pattern 2** event.



Hydrologic model Estimate of 5% Hazard Max 1.2m2/s; Duration: @ 0.6, 130min, @ 1.0, 75min
To confirm the Hydraulic model results



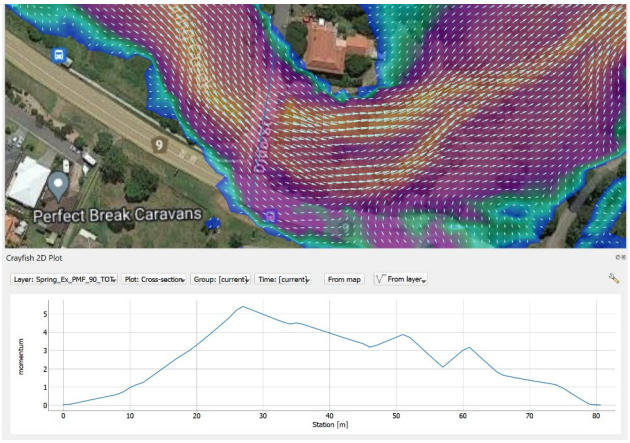


The worst Hazard Condition exists 180Minutes into the 360 minute Defined Event @ 1.2m2/s

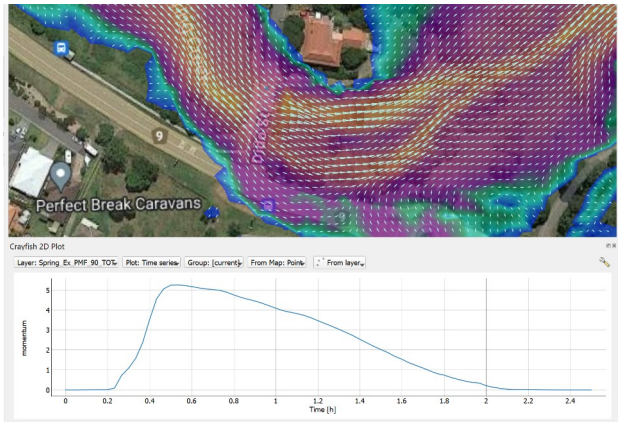
Duration: 5% Haz @ 0.6, 2.4hrs (144min),@ 1.0, 1.5hrs (90min).

A glaring artefact of the new ARR 2019 procedures is that the longer duration 360 minute median 5% event, compared to the 120minute median 1% event, has a longer duration of hazard at or above 0.6m2/s, at 144 minutes. A marginally lower duration exists for hazard at or above 1.0m2/s.

To Ensure the most extreme case has been addressed the PMF worst case is that resulting from the 90minute duration as follows:



The worst Hazard Condition exists 30Minutes into the 90 minute PMF Event @ 5.2m2/s



Duration: PMF Haz @ 0.6, 1.6hrs (96min),@ 1.0, 1.25hrs (75min).

3.0 EVACUATION HORIZONTAL – VERTICAL:

The time of limited access by vehicles is considerably within the range that is identified as "Flash Flooding" (6 hours). Given this outcome the most appropriate Flood Response is to **"Shelter In Place".** There are now many instances of Shelter in Place being utilised as the most appropriate outcome for short duration flooding. Shelter in Place has been stated in multiple guidelines on floodplain management for a number of years such as:

> **Evacuation v Sheltering in Place**
>
> Evacuation is a suitable strategy only when, by evacuating, people are not exposed to greater risks than they would face by remaining where they are. Due to the limited warning time available and the dangerous nature of flash flooding, in most flash flood catchments it may be more dangerous for people to evacuate than to shelter in place (ie stay inside their building and move to the highest place). Hazards that evacuees may be exposed to whilst evacuating are:
>
> - flooding of evacuation routes,
> - severe weather including strong winds, heavy rainfall, hail and lightning,
> - debris, and
> - fallen electricity lines.
>
> However, where buildings are located in floodways, it is likely that people will be exposed to high hazard conditions in which it will be more dangerous to shelter in place than to evacuate. In these circumstances an evacuation strategy should be adopted.
>
> It may be appropriate for a mixed strategy to be developed, with a shelter in place strategy adopted for buildings where evacuation is likely to be more dangerous than sheltering in place and an evacuation strategy where evacuation is less dangerous than sheltering in place. Areas where these strategies apply should be detailed in plans.

(AIDR 2017a)

Shelter in Place When Evacuation is Possible

Where sufficient warning time exists to evacuate at-risk residents safely, the option to evacuate should be taken. There are inherent risks with allowing people to shelter in place, as they may become isolated and later inundated by floodwaters.

The isolation of people is not without risk, and hence there is no such thing as a 'safe period of isolation'. Any individual who experiences a life-threatening event (for example a heart attack or a serious accident) while isolated is at significantly greater risk than a person who experiences the same condition but is not in an isolated position. There is a possibility that any one of a range of different emergencies could occur while a site is isolated. These may include fire, medical, rescue or security (crime) emergencies. Individuals may not be able to call for help (eg because of telephone system failure) and stretched emergency service resources may not be able to reach the isolated property in time. Responding emergency services through floodwaters is also dangerous. In addition, isolated properties may become refuges for snakes, spiders and vermin, and debris may threaten the structural integrity of buildings.

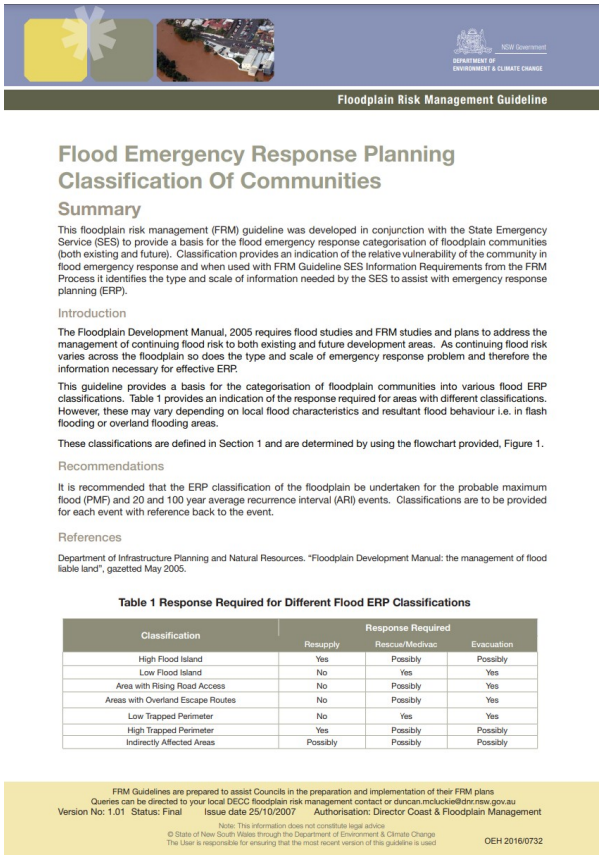
(AIDR 2017b)

EMA Manual 20 – Flood Preparedness (Commonwealth of Australia, 2009) includes a dedicated section discussing SIP as an alternative to evacuation, in case of flash flooding. Specifically, the Manual states that: *Evacuation is a suitable strategy only when, by evacuating, people are not exposed to greater risks than they would face by remaining where they are.*

EMA concludes by recommending a mixed strategy to be adopted, where shelter in place is to be preferred over evacuation only if "evacuation is likely to be more dangerous than sheltering in place" (Molino etal, 2017).
Further, in 2023 the Department of Planning and Environment released their draft shelter in place guidelines for discussion. https://www.planning.nsw.gov.au/policy-and-legislation/resilience-and-natural-hazard-risk/flooding/shelter-in-place

This Draft Policy identifies; *"There are two evacuation options – horizontal and vertical (shelter-in-place)."* Hence, for this proposal Vertical Evacuation is automatically provided as not a single dwelling is inundated, they are all above the flood level. All people who reside here are safe to "Shelter-In-Place", without the need to increase their elevation. They do become isolated from vehicular traffic, but can still for example, walk to the train station.

When it comes to the Status of been deemed able to evacuate, there is no reliance on have vehicles available. In fact, the Department of Environment and Climate Change, *"Flood Emergency Response Classification Of Communities"*, places this proposed development as "Areas Able to be Evacuated" as it has and "Overland Escape Route". As stated it is possible to walk overland unencumbered by flood water even in the PMF event. Again a person can reach the Railway Station for example. Two able bodies persons (ambulance officers) are able to carry an injured or unwell person via stretcher if absolutely required.



Floodplain Risk Management Guideline

Flood Emergency Response Planning Classification Of Communities

Summary

This floodplain risk management (FRM) guideline was developed in conjunction with the State Emergency Service (SES) to provide a basis for the flood emergency response categorisation of floodplain communities (both existing and future). Classification provides an indication of the relative vulnerability of the community in flood emergency response and when used with FRM Guideline SES Information Requirements from the FRM Process it identifies the type and scale of information needed by the SES to assist with emergency response planning (ERP).

Introduction

The Floodplain Development Manual, 2005 requires flood studies and FRM studies and plans to address the management of continuing flood risk to both existing and future development areas. As continuing flood risk varies across the floodplain so does the type and scale of emergency response problem and therefore the information necessary for effective ERP.

This guideline provides a basis for the categorisation of floodplain communities into various flood ERP classifications. Table 1 provides an indication of the response required for areas with different classifications. However, these may vary depending on local flood characteristics and resultant flood behaviour i.e. in flash flooding or overland flooding areas.

These classifications are defined in Section 1 and are determined by using the flowchart provided, Figure 1.

Recommendations

It is recommended that the ERP classification of the floodplain be undertaken for the probable maximum flood (PMF) and 20 and 100 year average recurrence interval (ARI) events. Classifications are to be provided for each event with reference back to the event.

References

Department of Infrastructure Planning and Natural Resources. "Floodplain Development Manual: the management of flood liable land", gazetted May 2005.

Table 1 Response Required for Different Flood ERP Classifications

Classification	Response Required		
	Resupply	Rescue/Medivac	Evacuation
High Flood Island	Yes	Possibly	Possibly
Low Flood Island	No	Yes	Yes
Area with Rising Road Access	No	Possibly	Yes
Areas with Overland Escape Routes	No	Possibly	Yes
Low Trapped Perimeter	No	Yes	Yes
High Trapped Perimeter	Yes	Possibly	Possibly
Indirectly Affected Areas	Possibly	Possibly	Possibly

FRM Guidelines are prepared to assist Councils in the preparation and implementation of their FRM plans
Queries can be directed to your local DECC floodplain risk management contact or duncan.mcluckie@dnr.nsw.gov.au
Version No: 1.01 Status: Final Issue date 25/10/2007 Authorisation: Director Coast & Floodplain Management

OEH 2016/0732

Section 1.3 Areas Able to be Evacuated

These are inhabited areas on flood prone ridges jutting into the floodplain or on the valley side that are able to be evacuated. However, their categorisation depends upon the type of evacuation access available, as follows.

- Areas with Overland Escape Route (OER) are those areas where access roads to flood free land cross lower lying flood prone land. Evacuation can take place by road only until access roads are closed by floodwater. Escape from rising floodwater is possible but by walking overland to higher ground. Anyone not able to walk out must be reached by using boats and aircraft. If people cannot get out before inundation, rescue will most likely be from rooftops.
- Areas with Rising Road Access (RRA) are those areas where access roads rising steadily uphill and away from the rising floodwaters. The community cannot be completely isolated before inundation reaches its maximum extent, even in the PMF. Evacuation can take place by vehicle or on foot along the road as floodwater advances. People should not be trapped unless they delay their evacuation from their homes. For example people living in two storey homes may initially decide to stay but reconsider after water surrounds them.

It is noted that "SURF BEACH CATCHMENT – KIAMA FLOODPLAIN RISK MANAGEMENT STUDY & PLAN (2017)", does not recommend evacuation, also adopting "Shelter in Place".

10.3.4. Evacuation

Evacuation is typically required in larger catchments in which over-floor flooding typically occurs. It requires substantial warning time to effectively remove affected residents from the area, and is usually of greater benefit when there is effective warning time available, or the duration of inundation is days or even weeks, rather than hours.

The nature of flooding in the Surf Beach Catchment means that residents should be encouraged not to enter flood waters during a flood event, and not attempt to self-evacuate via flooded roads. Flooding in the Surf Beach Catchment can occur and subside quickly, and the roads can become dangerous both due to water over roads and poor visibility due to heavy rain often associated with flood events.

The short warning time, rapid rate of rise and short duration indicate that evacuation improvements would have little benefit, and focus should be placed on community education and preparedness. Evacuation has therefore not been considered further, and community education and preparedness options are discussed further in Section 10.9.

From 2017 Surf Beach Catchment Study

4.0 SHELTER IN PLACE PRECEDENTS:

In 2006 the Land and Environment Court Granted approval to an 80 Dwelling seniors living development on Flood Prone Land. [2006] NSWLEC 164 , [2007] NSWLEC 482 .

In 2007 the court granted approval for a seniors living development in 118-120 Koona St. Albion Park Rail, stating that: “37 In my opinion, the flood liability of the site is not a reason for refusal”.

The contributing catchment is some 925 hectares. The site is in a High Hazard Floodway

[2007] NSWLEC 234 , [2007] NSWLEC 526 , [2007] NSWLEC 541 , [2007] NSWLEC 654

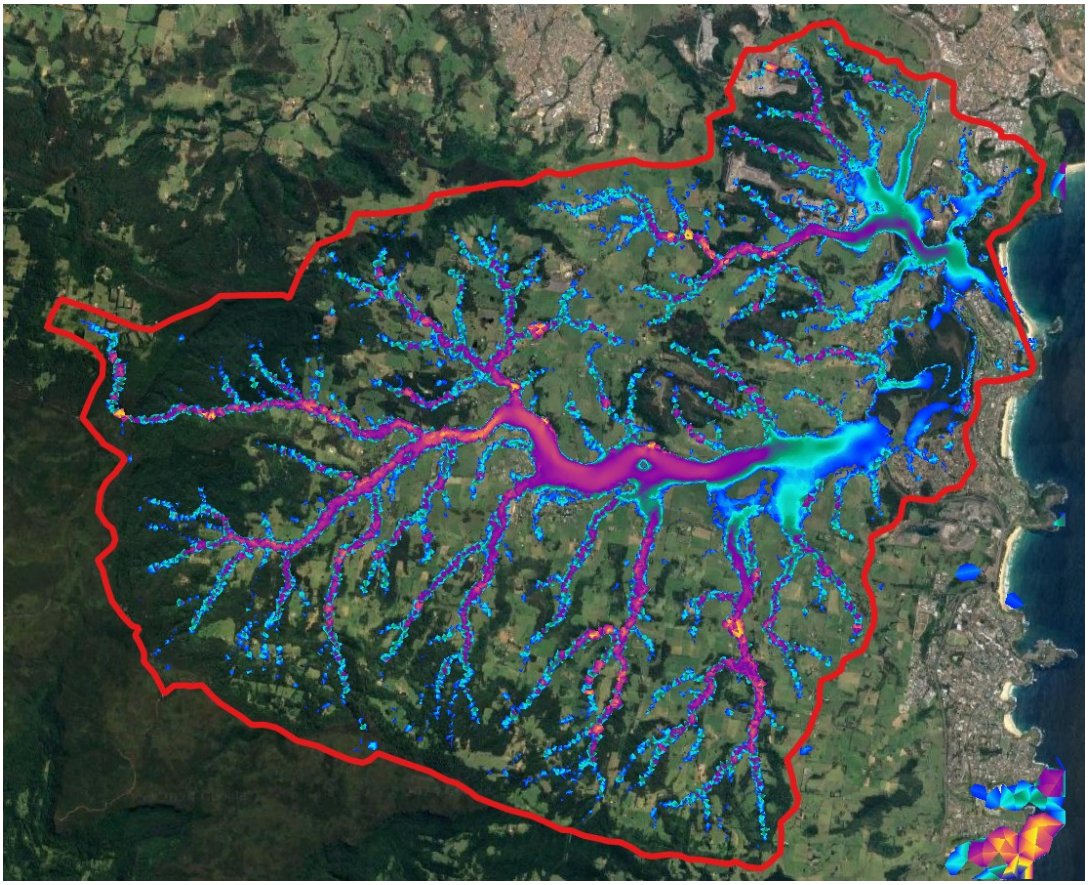
In 2021 and again in 2023 the court granted approval for the creation of 69 residential lots on the Central Coast. The land is isolated in a flood event and completed covered in water in 0.5% event and PMF events. The land was allowed to be filled to above the 0.5% event. This totally isolates the site from evacuation. The Ourimbah Creek catchment is 160Sqkm in area.

{ [2021] NSWLEC 1434 , [2023] NSWLEC 1185 }

Hence, on face value it would appear abundantly clear that if this development were to be resolved in the Land and Environment Court, the Court would support development of the land and not refuse the development on the grounds of flooding.

5.0 Apparent Inconsistent Planning Decisions:

It is clear and well known that all of Jamberoo is isolated due to flooding. Analysis suggests that Jamberoo may be isolated for many hours even days, yet Council continues to allow ongoing development of sub divisions in that scenario. This is seen as inconsistent to that applied to the site the subject of this report. The site is immediately adjoining the Kiama Township and major transport corridors of motorway and railway. The flash flooding nature of inundation of the access road Dido Street and the relatively minimal time of inundation (duration)



Minnamurra River Flood Model identifies Isolation of new developments in Jamberoo Valley

Further it is noted that as late as June 2021 Council in determining a development application in Dido Street did not raise the issue of flooding or particularly Egress as a reason for Refusal. It only identifies that a portion of the land is flood prone.

ORDINARY MEETING **15 JUNE 2021**

Report of the Director Environmental Services

12.4 Planning Proposal - Lot 2 DP 1018217 Dido Street, Kiama (cont)

Flood Risk	Central Precinct's submission raises concerns regarding increased risks from flooding associated with residential development on the subject sites, specifically Lot 2 DP 1018217. As stated in the submitted PP Report for Lot 2 DP 1018217, a portion of the land is identified as being flood prone.	A Flood Impact Analysis was submitted with the PP showing that the south-west portion of the subject site is affected by flooding. This area coincides with areas of high ecological value that are being retained as E2 Environmental Conservation zoned land and mapped as terrestrial biodiversity in Kiama LEP 2011. This portion of the site is highly unlikely to be developed upon due to its highly constrained nature and is unlikely to impact upon the residential components of the land. Stormwater management and flooding impacts are matters to be considered when assessing a future development application. This includes for the development of the site and individual allotments. to ensure pre-development flows are maintained.

No mention of any concerns regarding egress during a flood event.

As mentioned previously the Surf Beach Catchment which is flood prone does not recommend evacuation.

6.0 CONCLUSIONS:

It is concluded that the proposed development site is completely Flood Free to the PMF event. No evacuation is normally necessary. Evacuation is available on foot not encumbered by any flooding. It is possible to reach the main Highway and Railway Station in a 10-12minute walk. The nearest other house is around 5 minute walk from the site. Vehicular egress is limited for a duration of 1.95 hours (117 minutes) in the "Defined Flood" event. The defined flood from the latest ARR 2019 procedures identifies the median as the **1% 120 Minute with Pattern 4.** The catchment size and response is determined to result in "Flash Flooding". On this basis all available guidelines suggest that "Shelter in Place" is the best Floodplain management strategy to ensure the safety of the community. It is highly likely that the NSW Land and Environment Court would approve this development with conditions on the basis of available precedent. On face value it appears that Kiama Council has not been very consistent in how it deals with development proposals that are impacted by Flood water.

7.0 RECOMMENDATIONS:

It is strongly recommended that Kiama Council take into consideration the facts presented in this report that highlights that Shelter-In-Place is the preferred and recommended strategy for this development to manage flood risk. It has to be recognised that Evacuation is possible on foot, with a 10-12minute walk to the Railway Station at Bombo. It is recommended that approval for this proposed development not by upheld on any grounds related to Flooding.

REFERENCES:

AIDR (2020); "AUSTRALIAN DISASTER RESILIENCE HANDBOOK COLLECTION - Flood Emergency Planning for Disaster Resilience

Molino, Gray, Dall'Osso, (2017); "DEVELOPING A PRACTICAL SHELTER IN PLACE POLICY: A CASE STUDY IN FAIRFIELD"

NSW Department of Planning and Environment (2023); "Flood risk management manual- The policy and manual for the management of flood liable land", ISBN 978-1-923076-17-4